AMES PLOW CO.

James Cook

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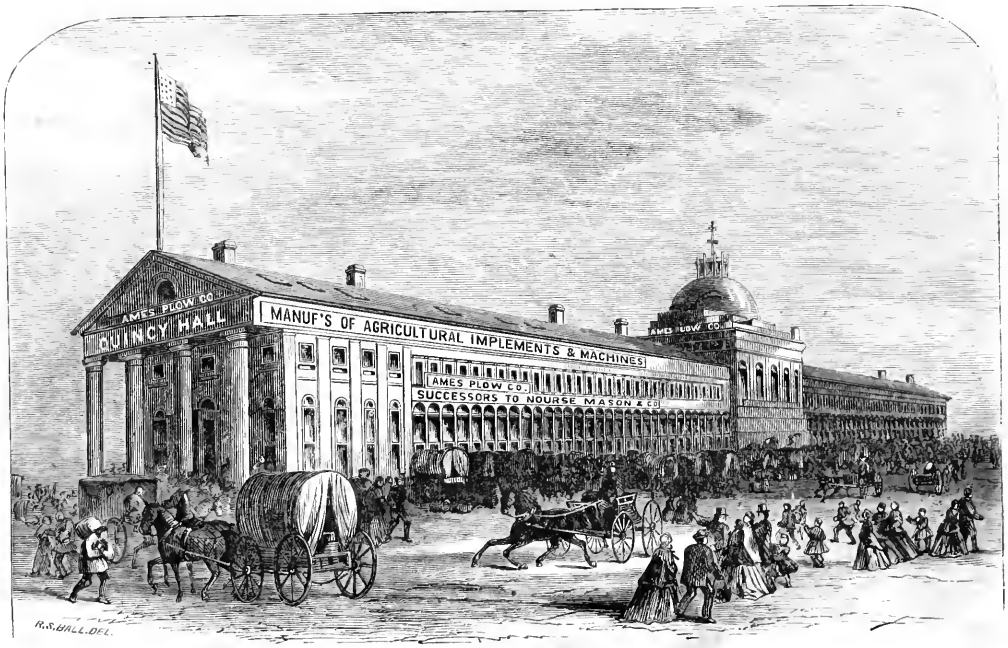

AMES PLOW CO.
QUINCY HALL
MANUF'S OF AGRICULTURAL IMPLEMENTS & MACHINES
AMES PLOW CO.
SUCCESSORS TO NOURSE MASON & CO
AMES PLOW CO.
R.S. WALL. DEL.

Illustrated Catalogue.

PLOWS,

Agricultural Implements,

AND

MACHINES,

MANUFACTURED AND SOLD BY

AMES PLOW COMPANY,

(SUCCESSORS OF NOURSE, MASON AND CO.)

WAREHOUSES:

Quincy Hall, Boston; 53 Beekman St., New York.

FACTORIES:

WORCESTER AND AYER, MASS.

1876.

PREPARED FOR THE PRESS BY J. HARRIS REED.

INTRODUCTION.

SINCE the Catalogue issued by their predecessors, the advance in all the appliances for use by the agriculturist to economize labor has been so marked, and the implements which are in daily demand differ so materially, that

THE AMES PLOW COMPANY

feel that their numerous customers require a complete Descriptive List of their Manufactures, in order to enable them to select the implements best adapted to aid them in obtaining desired results.

In offering this Catalogue to their friends and customers, they tender their heartfelt thanks for the patronage, which, given to their predecessors through a course of business of many years' duration, has been continued to them, — a patronage so rapidly increasing, and so satisfactory, as to command their earnest efforts to meet its requirements; inducing them to add materially to their heretofore extensive manufacturing facilities, by the erection, at Worcester, of a series of buildings especially adapted (by the introduction of all modern improvements) to the furnishing, in as perfect a manner as possible, all implements and machines necessary to agriculturists everywhere.

The business to which they succeeded had been conducted as long as the ordinary lifetime of a generation. The varied knowledge of the wants of agriculture, the experience and numerous facilities in manufacturing accumulated during that extended period, give the means to offer implements and machines of the most fitting invention, constructed of the most suitable materials, in a thorough and finished style, and at prices affording simply a fair remuneration for the capital and labor employed. Their business-connections are such as to secure early information of all improved or newly-invented agricultural implements, wherever originating; and they will at once furnish the public with such of them as may be of approved utility.

The rate at which Agriculture is advancing is surprising and unprecedented, and its new developments are constantly demanding implements of new form from the manufacturer: he, in turn, by his inventions, is suggesting new modes of husbandry to the agriculturist. The two operate back and forth upon each other, and the benefit is mutual. Their aim, as was that of their predecessors, will be to keep pace with the agriculturist; and they invite him to suggest improvements in their manufactures; and they, in return, by their new inventions, will endeavor to lighten his labors, and make them more efficient and profitable.

While they, from time to time, have brought forward a great variety of implements and machines, combining about all of value in agricultural mechanics, they have always kept in mind that ancient yet most important implement, **THE PLOW**, and have given to its improvement a great amount of thought and experiment, and expended money liberally, so that, from an early period, the **EAGLE PLOWS**

have possessed a wide celebrity for excellence of work, and a patronage entirely satisfactory, notwithstanding the sharp and varied competition with which they have had to contend. Various experiments have resulted in the perfection of a new variety of the Eagle Plow, named "Deep Tiller," which is peculiarly adapted to the modern requirements of thorough pulverization, and of the various forms and proportions fitted to the best working of the different soils.

By means of their continual inventions, and the early adoption of all thoroughly-tested improvements, and also by their extensive manufacturing establishments at Worcester and Ayer, they are enabled to offer unequalled facilities for supplying all the requirements of agriculturists at home and abroad.

While they will offer CERTAIN MACHINES OF SUPERIOR USEFULNESS, they will not neglect the minor requisites; but this Catalogue will be found to embrace all implements necessary to the proper cultivation of the soil — the planting of the seed — the harvesting of the crop — the preparation for market: in short, every aid to the GREAT RESULT to be attained in successful agriculture, — *ample remuneration for labor.*

THE PLOW.

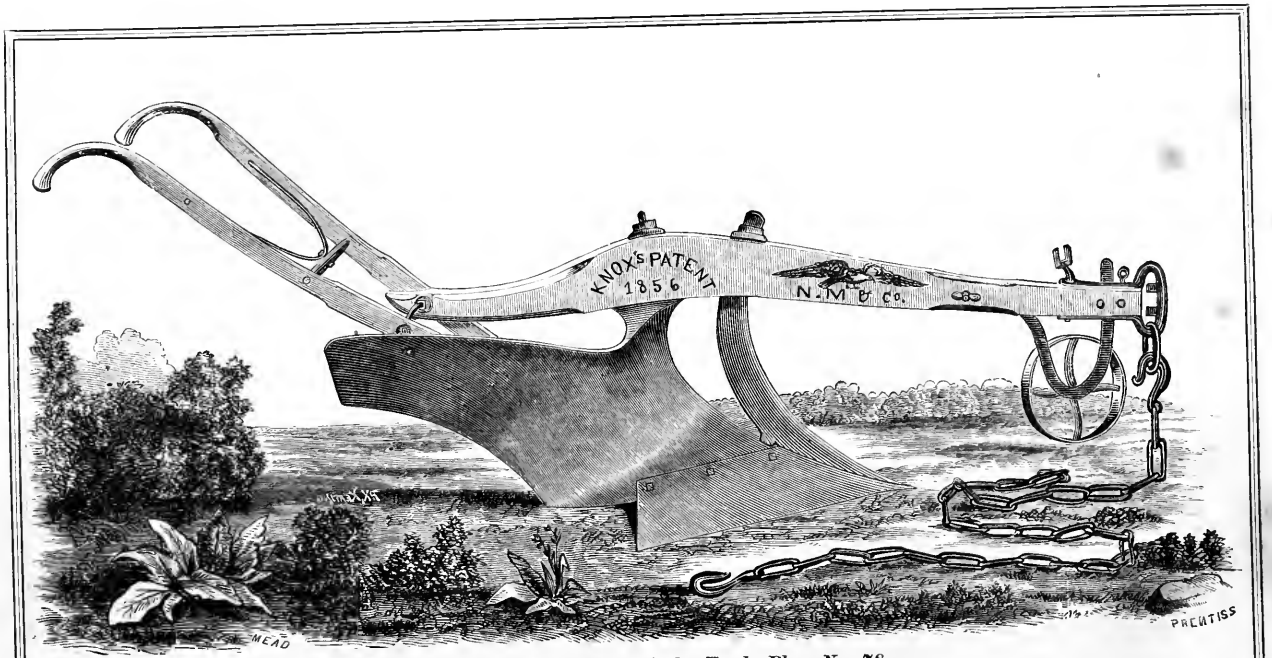


Fig. 1.—"Deep Tiller," Sod. Eagle Plow No. 78.

THE PLOW.

The general form of the plow is known to every one, and to an unobservant eye it appears to be a very simple and even primitive implement; nevertheless, much mechanical skill and ingenuity have been expended in adapting it to its work.

The plow is probably the most ancient implement used in the cultivation of the soil; and antiquarians agree, that it had its origin in Egypt, where it was made wholly of wood, and in some instances consisted of little more than a pointed stick, which was forced into the ground as it was drawn forward; in fact the earlier plows were neither more nor less than varieties of the pick or hoe. The Egyptians gradually improved the form, till it assumed the appearance of a hollow wedge formed by the two handles joined at the bottom, the beam fastened between the handles a little above their point of junction.

The Romans largely improved the plow, adding to it the coulter and mould-board, and in or about the time of Pliny, wheel plows were in use and are referred to by Virgil in his Georgics. A later and more improved form, in which the handles were made to incline backwards, and the coulter was placed so far back as to be directly above the share, is still in use in Northern Italy and Southern France, and the plows used at the present day in most other parts of the continent of Europe are equally rude and inefficient with the Italian and French implements. There are no traces that the plow was known among the Aborigines of North and South America.

The only countries in which the plow has been brought to a state worthy of being considered effective, are Britain and America. Early in the last century, attention was turned to the improvement of the plow; still, until about the middle of the century, wrought iron was used for the parts of the plow which entered the ground, each part very rudely forged with much labor. Cast-iron mould-boards were first substituted for those of wrought iron about 1740, by James Small of Scotland, who made many improvements, and at his death he left the implement so nearly perfect that to this day it is used in many of the best-cultivated districts in Scotland. In 1785, Robert Ransom of Ipswich patented a cast iron share, and before 1790, the land-side also was made of cast iron.

In the United States among the first to give attention to improvements in the plow was Thomas Jefferson, and he wrote an elaborate essay on the

construction of the mould-board, which he communicated first to the Institute of France, and afterwards to the Board of Agriculture of England.

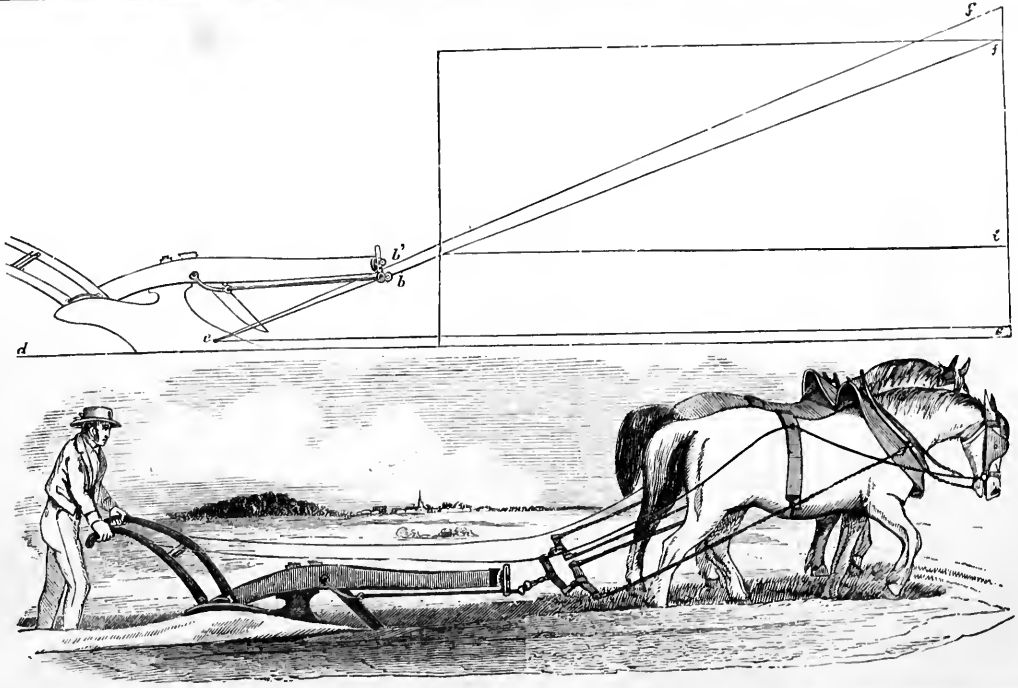
The first cast-iron plow invented in this country was by Charles Newbold, and his patent is dated in 1797, and as early as 1800 such plows were in use near New York city. In 1807, a patent was granted to David Peacock for a plow having mould-board and land-side of cast iron, and separate, while the share was of wrought iron edged with steel. In 1813 a patent was granted to R. B. Chenowith, of Maryland, for a plow having the three parts, mould-board, land-side and share, all distinct and of cast iron. Other patents were granted before 1819, when Jethro Wood patented a plow which became very popular, and superseded the old clumsy plow then in use. In 1823, David Hitchcock patented a plow which was very popular, and had a large sale for eight or ten years. It was the castings of these two patterns that Mr. Joel Nourse purchased at Hartford after his removal to Worcester.

Since that time various improvements have been made, some of marked importance and others rather suggestive; among the former is that for which a patent was granted to Samuel A. Knox, of Worcester, Mass., by which the construction of the mould-board is strictly geometrical, and it probably works with as little resistance as any plow ever made. This mode of construction admits of all the variations necessary to produce long or short mould-boards, with straight lines forming concave or convex surfaces as required for different soils or kinds of work.

In view of the fact that the plow has always been regarded as the basis of all civilization and all wealth, it may well excite astonishment that it should have required so many years to have made the few successive advances given in this account; yet there will be an apparent reason for this when it is stated, that until the present time there has been no clear and definite idea in the minds of inventors of the precise objects which they were seeking to accomplish.

It hardly seems possible that the next fifty years will show any such advance in improving this important implement as the last fifty.

PLOWING.


f'
f
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PLOWING.

From the complicated structure of the plow, and the manner in which circumstances oblige us to apply the draught to the implement, some misconceptions have arisen as to the true operation of draught, and the proper manner of its application. Too little is understood of the true principles of draught, to enable the plowman to attach his team, and arrange the clevis, so that the plow will do its work properly, and with the least force or power.

The following explanations of the plate opposite will render this subject intelligible to every mind.

Let *b* represent the forward end of the beam, and c the centre of resistance on the plow, which may be assumed at two inches above the plane of the base of the plow, *d e*, though it is liable to constant changes, from the depth of the furrows and constant inequalities in the soil.

We have first to consider the particular form of those parts through which the motive power is brought to bear upon the plow. It is evident that the motive force acts in a direct line from the hook or ring at the shoulder of the animal, to the centre of resistance, and a straight bar or beam, lying in the direction *c b*, and attached firmly to the body at *c*, would answer all the purposes of draught, perhaps better than the present beam, but for considerations of convenience. The draught, however, not being the end in view, but merely the means by which the end is accomplished, the former is made to subserve the latter; and, as the beam, if placed in the direct line c to *b*, would obstruct the proper working of the plow, we are compelled to resort to an indirect action to obtain the desired effect. This indirect action is accomplished by means of an angular frame-work, consisting of the beam, and the body of the plow, so strongly connected together as to form an unyielding structure. The effect of the motive force applied to the frame-work at the point *b*, and in the line *b* to *f*, produces the same results as if *c b* were firmly connected by a bar in the position of the line c to *b*, or as if that bar alone were employed.

The average length of the trace-chains being ten feet, including all that intervenes between the clevis of the plow at *b*, and the horse's shoulders, let that distance be set off in the direction *b* to *f*; and the average height at the horse's shoulders, where the chains are attached, being four feet and two inches, let the point *f* be fixed at that height above the base line *d e*.

Draw the line from *f* to *c*, which is the direction of the line of draught acting upon the assumed centre of resistance *c;* and if the plow is in proper trim it will coincide also with the ring of the clevis, *e c f* being the line of draught and equal to 20°. It will be readily perceived that, with the same length of hames, the angle *e c f* is invariable; and if the plow has a tendency to rise at the heel, or run on the point under this arrangement, it indicates that the ring at *b* is too *high* in the clevis. Shifting the ring one or more holes downward will bring the plow to work evenly upon the base of the landside or work flat.

If the plow has a tendency to rise at the point of the share, the ring *b* is too *low*, and must be moved by raising it one or more holes in the clevis. If a pair of taller horses be harnessed to the plow, the draught-chains, depth of furrow, and soil remaining the same, we should have the point *f* raised, suppose to *f';* by drawing the line *f'* to *c*, we have *e c f'* as the angle of draught, which will be 22°, and the *ring* will be found to be *below* the line of draught *f' c;* and if the draught-chains were applied at *b*, in the direction *f' b*, the plow would have a tendency to rise at the point of the share, by the action of that law of forces, which obliges the line of draught to coincide with the line which passes through or to the centre of resistance; hence the ring would be found to rise from *b* to *b'*, which would raise the point of the share out of its proper direction. To rectify this, the ring must be raised in the clevis by a space equalling that between *b* and *b'*, causing it to coincide with the true line of draught, which would again bring the plow to work evenly on the base of the land side and run flat.

The foregoing principles are substantially such as are adopted by the most experienced plowmen, and, if properly applied, will not only do the best work, but accomplish it with the greatest ease to themselves and their team. If the power (or team) is not rightly applied, good work cannot easily be done; for if the plow inclines in or out of the ground too much, or takes too wide, or too narrow a furrow-slice, the plowman must exert force to direct it properly, in addition to that required to overcome the obstacles and inequalities in the soil; but if the power be rightly applied, the plow will move so accurately, as not only to perform good work with more ease to both plowman and team, but, in soils free from obstructions, even without a guide.

To effect a proper horizontal movement, the clevis at *b* or draught-rod (if one is used instead of a clevis) must be adjusted and confined at that point, moving it to the right or left, if necessary. This will cause the plow to take the proper width of furrow-slice, which, in sod, should be wider or narrower according to the depth of furrow, or rather the thickness of the furrow-slice required; for as the thickness is increased, so also must be the width in proportion, in order to turn it easily and perfectly over, particularly when the furrow-slices are required to be laid over level,

and side by side. The proportion in ordinary sod should be seven by ten, or the width or depth should be varied *only in this proportion*.

In determining the width of furrow-slice, some regard must be had to the strength of the particular sod to be turned; for the plow will turn over a wider slice in a strong stiff sod than when running in one more easily broken, or it will cripple and double when raised to a perpendicular position, thus only doing the work called "cut and cover."

When the slices are required to be laid at an angle and lapped each one upon the preceding, the proportion of width should be as seven to ten, thus setting the furrows at an angle of 45°, which is the position of furrow presenting the greatest attainable surface to the action of the atmosphere, and the greatest cubical contents of soil to the action of the harrow in preparing a seed-bed.

PLOWS.

PLOWS.

Knox's Patent and Improved Eagle "Deep Tiller"—Improved Swivel for Side Hill and Level Land—Boston Steel Clipper—Sessions and Knox's Patent Hard Steel—Mapes' Improved Sub-Soil—Hakes' Patent Turn-Wrest or Swivel.

The **Eagle** trade-mark of plows was originated many years ago by our predecessors. From an early period it has possessed a wide celebrity, and its pre-eminence is still maintained over attempts at imitation by other plow makers.

In a new country the early settlers feel compelled to secure present profits, without special regards to results in the future, and they consider the quickest and cheapest manner of plowing and preparing the ground for the reception of seed as the best for them. For this reason, our early settlers used plows with very short mould-boards, of abrupt curvature, carrying shallow and wide furrow-slices; hence, mainly in consequence of such shallow tillage, the land became very thin and exhausted of fertility, affording narrow range for the roots of crops, and too susceptible to the influence of drouth.

As these conditions were gradually understood, a demand arose for plows adapted to deeper and finer work, and many new patterns, by Knox and others, have been introduced into our Eagle, Boston Clipper, and other varieties, as the wants of the country seemed to demand, until we are now enabled to offer an assortment, which is probably the best adapted to all kinds of soil that can be found.

Our plows embrace sizes and forms suited to the working of all soils, and to the peculiarities of a widely varied agriculture. The improved "Deep Tiller" plows are constructed by a new scale of proportions invented by our artist, Mr. Samuel A. Knox, who obtained Letters Patent for his very original and useful invention. His mode of construction is the result of much study and experiment, and admits of all variations necessary to produce long or short mould-boards, with straight lines forming concave or convex surfaces, as required for different soils or kinds of work. The mould-boards, thus constructed, have such a combination of curved

lines as presents an equal bearing against the furrow-slice, and insures an even polish to the entire face of the mould-board, while the furrow-slice undergoes an equal and effectual twist, which lays it down with precision, disintegrating and pulverizing the soil, and leaving it admirably fitted for the reception of atmospheric influences, and free expansion of the roots of vegetation.

They are well made, from the most durable materials, ensuring strength, thoroughly finished, and with the various fittings attached the requisite variations in depth and width of furrows are obtained.

The iron plows are an admixture of several kinds of that metal, — the result of many experiments, — giving toughness, hardness, and durability, by which great strength with lightness is secured.

The edges of the points and soles of the land-sides and mould-boards are hardened in casting, by a process of chilling, which insures at least three times the ordinary wear.

The steel plows are made of the best material, hardened to the extreme degree of hardness, and with perfectly smooth and polished surfaces.

The beams and handles are of white oak, dressed by unerring guides and patterns, so that all of a given kind are alike and the plows are uniform in their operation and parts.

The duplicate parts for each pattern of these plows, to supply the place of those worn out, can always be promptly furnished to order. The mould-boards, points, land-sides, beams and other parts of each kind of plow have specific marks or numbers inscribed on them, which entirely distinguish them from those of other plows, and duplicates ordered will nicely fit the place for which they are intended.

NEW PLOWS—"DEEP TILLER,"

CAST-IRON MOULD-BOARDS.

GREENSWARD.

Eagle Plow No. 78, represented by Fig. 1, is the largest of the "Deep Tiller" variety. It is rigged with lock coulter and broad steel share for rugged work among stumps, roots and stones, and for making and repairing roads. It is very strong, and may be worked by six or eight oxen, turning furrow-slices from nine to fourteen inches deep, and sixteen to twenty inches wide; when used in connection with the lifting sub-soil plow of largest size, it materially lessens the cost of clearing new land.

Eagle Plow No. 77, represented by Fig. 2, is next in size, and will carry a furrow-slice from eight to twelve inches deep, by fifteen to eighteen inches wide, and has great turning power; it is worked by six oxen or horses in easy soil, or by eight in heavy soil. In the construction of its mould-board great attention is given to the principles of easy draught; the share and front of the mould-board are of a form to give easy entrance under the slice, and presenting the mould-board with so little friction, that great work is done in proportion to amount of team required.

Eagle Plow No. 76 when made with lock-coulter is of the same general construction as Eagle No. 78, and performs in proportion to size, working from seven to ten inches deep, and fourteen to sixteen wide.

Eagle Plow No. 76 when made with cutter for smooth land is of the same general construction as Eagle No. 77, and performs in proportion to size, working from seven to ten inches deep, and fourteen to sixteen wide.

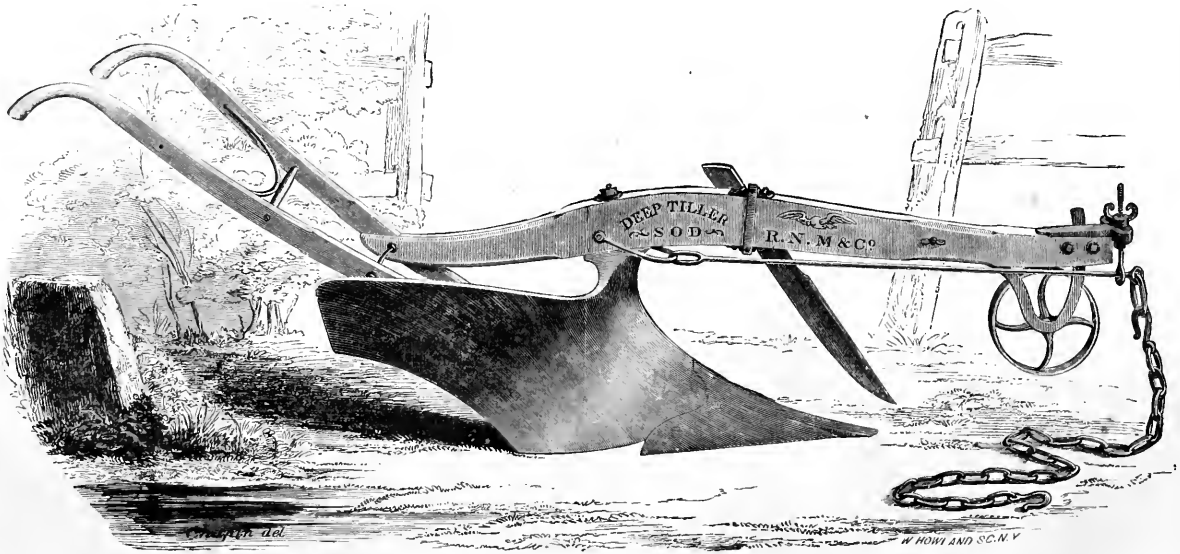

Fig. 2.—"Deep Tiller," Sod. Eagle Plow No. 77.

Eagle Plow No. 75, represented by Fig. 190, is smaller than, but of the same construction as, No. 76, and performs in proportion to size, working from six to nine inches deep and thirteen to fifteen inches wide. With four oxen or horses it is very effective, performing perfect work at a depth of nine inches, inverting the furrow-slices flat, even and very exact, completely covering the stubble.

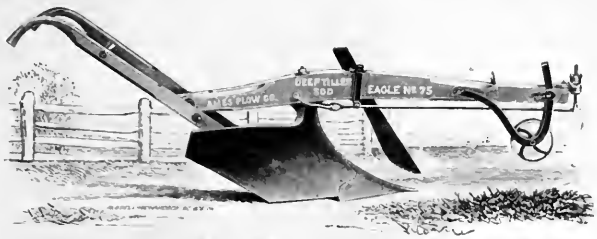

Fig. 190.—"Deep Tiller" Sod, Eagle Plow No. 75.

This plow is confidently recommended as the best ever produced for use in the *preparation of new lands* for Indian corn, wheat and other grain crops. In many colonial markets this celebrated plow is used to the *exclusion of all others*, and wherever introduced in the grain-producing parts of the world the demand has increased rapidly, and for the past few years the annual production and sale has far exceeded that of any other kind manufactured.

From facts within our knowledge we are prepared to state, without fear of contradiction, that the quantity of these plows now in use far exceeds that of any other variety, and the total sales from the first introduction are very much larger in amount than the entire manufacture of *any other plow invention or pattern* known to the farmers of the world.

Eagle Plow No. 55, of the same size and weight as No. 75, is of about the same capacity; but, differing in form and being higher in the standard, it is also different in its working qualities.

Eagle Plow No. 25 is an older pattern of same size, but different in form and working qualities. It is a very strong and durable implement.

Eagle Plows No. 75, 55 and 25 for the colonial markets are always trimmed with draft-rods, wheels and cutters, as shown in Fig. 190.

For foreign shipment we take entirely apart, and pack in cases in small compass, without any waste of room.

Eagle Plow No. 73 1-2, Fig. 3, is next in size, and turns sod furrow-slices five to eight inches deep, by eleven to fourteen inches wide, and may be drawn by two horses or oxen to the depth of seven inches. It is adapted to flat or lapped plowing, by the use of an inclined cutter for the first, and a straight cutter for the latter mode of plowing.

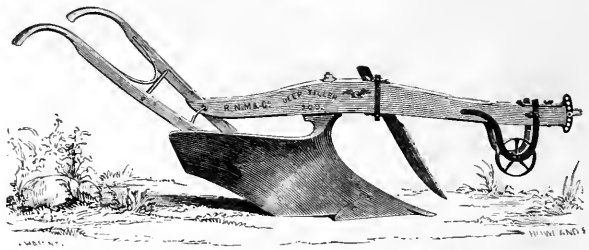

Fig. 3.—"Deep Tiller," Sod. Eagle Plow No. 73 1-2.

Its mould-board is of a long, gentle curvature, specially designed for plowing loose, porous, sandy and gravelly loam, and the twist of furrow-slice is so long and easy as to avoid unduly opening and disuniting its constituent parts. The defect of such soil is its open and porous nature, too readily giving up the moisture and fertility to evaporation, needing more compactness of parts, hence the powerfully pulverizing plow is not the best for working it. It is best plowed in perfectly flat furrow-slices, the edges of which are closely matched and the cohesion of the soil so preserved that the plowed land lies smooth and firm. The best and most experienced cultivators of light, dry lands have found that, by thus plowing them, and then compressing the furrow-slices closely with a heavy roller, they best insure the germination of seeds, an even stand of crops, and protection of the growing plants from the parching influences of drought.

Eagle Plow No. 71 1-2 is next in size, having the same relative proportions as No. 73½, turning sod furrow-slices five to seven inches wide, and eleven by thirteen deep, and is easy work for two cattle.

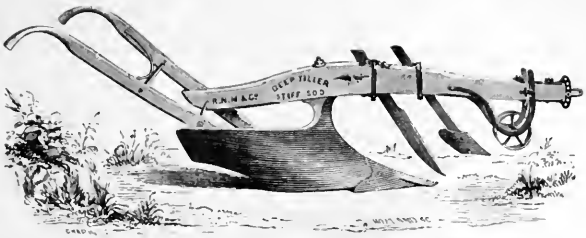

Fig. 4.—"Deep Tiller," Sod. Eagle Plow No. 72 1-2.

Eagle Plow No. 72 1-2, represented by Fig. 4, has a long, narrow mould-board, of a convex surface, and is specially designed for stiff soil, turning narrow furrow-slices, two-thirds as deep as they are wide, and is adapted to work seven inches deep by ten inches wide, in stiff clay sod, setting the furrow-slices at an inclination of 45°, which is the position presenting the greatest attainable surface to the action of the atmosphere, and the greatest cubical contents of soil to the action of the harrow in preparing the seed-bed. When the attempt is made to work clay-soil with plows of short, wide, abruptly curved mould-boards, the furrow-slices are too wide for their depth, and, being turned abruptly, are broken in large pieces, rather than disintegrated; they are laid over too flat, and in heavy clods, and a proper pulverization of the soil cannot be obtained.

This plow, by its gentle convexity and curvature of mould-board, is calculated to work bright and free in the most adhesive soil. The plow is rigged with or without the skim-coulter, though this attachment is valuable, because it disposes of the grass-edge of the slice, thus preventing the growth of grass between the lapped furrow-slices, and its use is a convenience where finished lapped work is desired.

NEW PLOWS—"DEEP TILLER."

CAST-IRON MOULD-BOARDS.

STUBBLE.

Eagle Plow No. 33, Fig. 7, is for stubble plowing, and may be used as a swing-plow as represented, or with the addition of the wheel. It is ordinarily made with the plain share, but, when required, can be furnished with fin share, as shown in Fig. 7. This plow is very high in the standard, which enables it to keep its course and depth in the ground

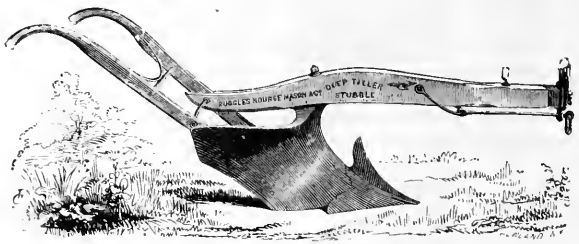

Fig. 7.—"Deep Tiller," Stubble. Eagle Plow No. 33.

without clogging. Its mould-board is short and high, of a capacity for deep work, of great turning power, and it thoroughly disintegrates and pulverizes the soil. It works from eight to ten inches deep, by eleven to thirteen inches wide.

Eagle Plow No. 34 is made as a swing plow when used for old ground, or fitted with wheel and cutter is adapted for greensward. It is much liked by farmers, as in its working it leaves the ground well pulverized and light. It turns furrow-slices from nine to eleven inches deep, and twelve to fourteen wide.

It has taken many premiums at various Plowing Matches.

Eagle Plows No. 30, 31 & 32, smaller sizes, and **No. 35,** larger size, are of the same principle of construction as No. 33, and their work is proportionately the same.

Eagle Plow No. 39 is specially adapted to the burying of broom-corn stubble. Through the Connecticut valley, where it has been much used, it is commended for its capacity to put the hills and stalks of the broom-corn crop entirely beneath the surface.

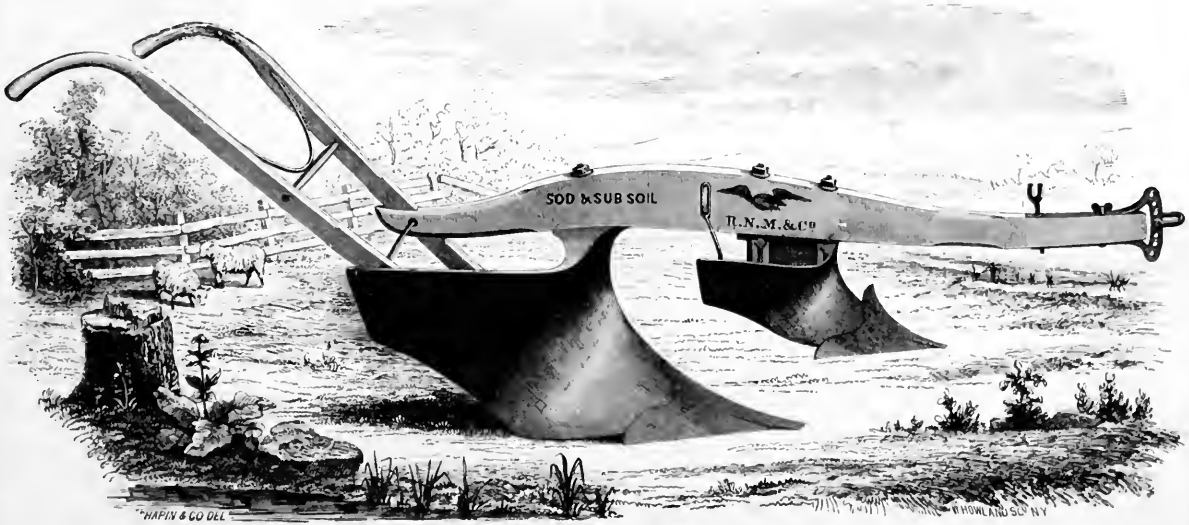

Fig. 8.— Knox's Improved Eagle Plow No. 34. Greensward and Subsoil.

Knox's Improved Eagle Plow No. 34, Greensward and Subsoil, is represented by Fig. 8. The forward mould-board is connected with the beam, and its depth of furrow is adjusted as follows: A substantial iron flange is fastened to the under side of the plow-beam by two bolts passing up through the flange and the beam, and made tight on top by nuts and screws; the flange has two rows of slots in it, to receive the bolts from the land-side of the forward plow, and the plow is made fast to the flange by bolts and nuts. By means of the slots in the flange, the forward plow may be raised or lowered, according to the depth of plowing desired, and made fast at the requisite point to give the desired depth.

The forward mould-board turns the sod-furrow-slice as wide as the working of the whole plow, and the earth on top, assuming an arch-like shape, is naturally opened, while the effort of the rear mould-board brings up the deeper soil, placing it upon the sod and filling the channel, so that the sod-furrow-slice is in no case liable to be brought to the surface by harrowing or other processes of after-cultivation; the cohesion of the soil is broken, and the plowed land lies light and mellow, and almost as fine as if harrowed,—indeed, in some soils rendering the use of the harrow quite unnecessary.

Knox's Improved Eagle Plow No. 33, Greensward and Subsoil, represented by Fig. 9, is a size smaller than the preceding.

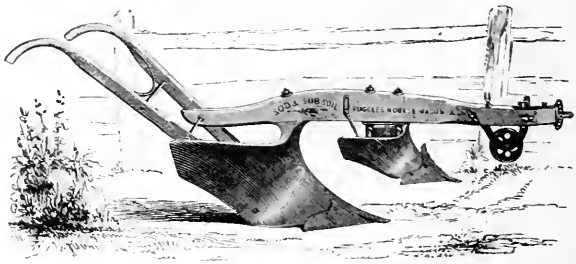

Fig. 9.—Eagle Plow No. 33. Greensward and Subsoil.

TURN-WREST (SWIVEL) PLOWS

FOR

HILL-SIDE AND LEVEL LAND.

Eagle Plow No. 83, represented by Fig. 5, is a Turn-Wrest (Swivel) Plow for hill-side or level land plowing. Its mould-board, two in one, has the principles of construction of the other "Deep Tiller" Plows; it is adapted to turn sod-slices five to seven inches deep, by ten to twelve inches wide. A hook, fastened by a staple to the centre piece of the handles, and changing to either side of the beam as may be desired, enters the back part of the mould-board, and holds it fast on either side of the standard as wanted.

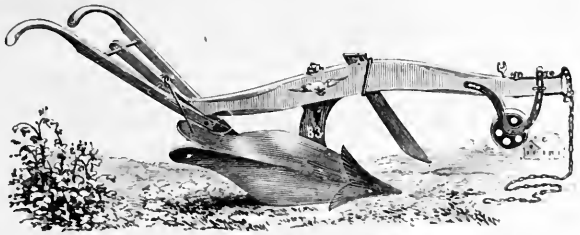

Fig. 5.—"Deep Tiller," Sod. Eagle Plow No. 83.

The mould-board is easily and instantly changed from one side of the standard and beam to the other, making a right-hand or left-hand plow at pleasure, while the team is turning at the end of the plow-field; indeed, if the hook is lifted, it naturally changes from one side to the other of itself, while the team is coming about at the ends of the field.

With it the plowman may commence on the lower edge of a hill-side, and turn his furrow-slices all down the slope, changing his plow to a right-hand or left-hand one at each turning of the team at the ends of the field; or he may begin on one side of a level field, and lay his furrow-slices all one way, thus avoiding the "dead" furrow in the centre, and the ridging on the sides. At the next rotation of crops on the field he may begin on the opposite side, and turn the furrow-slices back again, thus keeping the soil equally distributed and the surface level. It is used with two or three cattle.

Eagle Plow No. 84 is a size larger, turning flat sod-furrows six to nine inches deep; when worked to a greater depth four horses or cattle are needed.

Eagle Plow No. 82 is like the two preceding, in general construction, but has a quicker turned mould-board to fit it for stubble or old-ground plowing, and is used with two cattle.

Eagle Plow No. 85, Turn-Wrest (Swivel) Sod and Subsoil, represented by Fig. 6, was invented by Knox, and its mould-boards are formed on the principles discovered and perfected by him. It is so constructed that two plows attached to one beam are readily changed from one side to the other, turning the furrow-slices either to the right or left, as desired. The

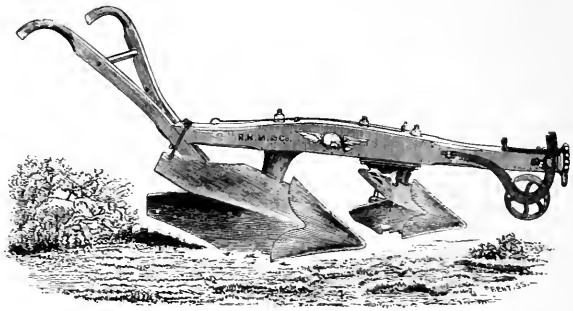

Fig. 6.—"Deep Tiller," Sod. Eagle Plow No. 85.

forward plow turns the sod to the depth of about three inches, depositing it at the bottom of the channel; and the rear plow works to the depth of five to seven inches, raising and pulverizing the under or subsoil, and depositing it upon the forward furrow-slice, burying the sod below the reach of the harrow or cultivator.

This plow, combining the sod and subsoil principle, accomplishes both in hill-side and level-land plowing all the advantages of sod and subsoil work, and the person using it on level land, as well as hill-sides, begins on one side of a field, and passing back and forth turns the soil all one way, thus avoiding the centre or dead furrow. To change the plows on arriving at the end of each furrow, the plowman leans forward and raises the hooks or latches, retaining his hold on the handles, to keep the instrument in an upright position, while the team, in coming about, changes the plows to the opposite side of the beam. The beam is then tipped towards the plows, the forward plow latches itself and becomes confined, and the plowman again stoops forward and latches the rear plow to its place, the whole being easily and quickly done.

KNOX'S IMPROVED EAGLE TELEGRAPH PLOW.

GREENSWARD.

Knox's Improved Eagle Telegraph Plow, represented by Fig. 10, is an improvement over the other Greensward Plows. The form of the mould-board is changed in a manner to give a decided advantage in laying the furrow-slice, and is secured to the beam by a clasp instead of a bolt. The form of the standard, and also the shape of the beam, is varied from the other pattern.

We make three sizes; the working qualities of each are given below.

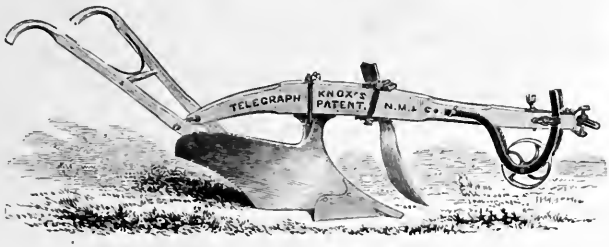

Fig. 10. — Telegraph Plow.

Telegraph Plow No. 1 turns a flat furrow-slice, working six inches deep, by twelve inches wide, and is light for two cattle.

Telegraph Plow No. 2 turns a flat furrow-slice, working from five to seven inches deep, by ten to twelve inches wide, and is used with two cattle.

Telegraph Plow No. 3 turns a flat furrow-slice, working from six to eight inches deep, by ten to twelve inches wide, and requires two or three cattle.

BOSTON STEEL CLIPPER PLOWS.

SESSIONS AND KNOX'S PATENT HARD STEEL.

The soil of Western and some other States is composed largely of vegetable substances, with little perceptible flinty or inorganic matter intermixed, and, lying loosely after the sod has been broken and subdued, it does not present friction or scouring quality enough to the cast-iron mould-board to give it a suitable polish. Steel, being a finer and less porous metal than cast iron, and less affected by rust, requires much less friction to give it a high polish, and is considered the more desirable material for the construction of the mould-board, share and landside of plows for working such soil. These considerations have induced the proprietors to duplicate, in steel, a portion of the mould-boards of their new plows named in the preceding pages.

Duplicates of the various parts of each pattern are always kept on hand, so that persons using the plows can obtain such as may be needed, with the certainty that the parts ordered will fit the places for which they are required. The shares are put on with bolts, and may be replaced at any time with new ones; as those of any given pattern are exact duplicates they will fit perfectly, and can be attached to the plow without the aid of a blacksmith.

Boston Steel Clipper Plow, W B 2, is represented by Fig. 12. The mould-board and share are duplicates of Plow No. 72½ in cast iron, but the standard is higher, to enable the plow to keep its course through the extra amount of stubble and vegetable matter usually encum-

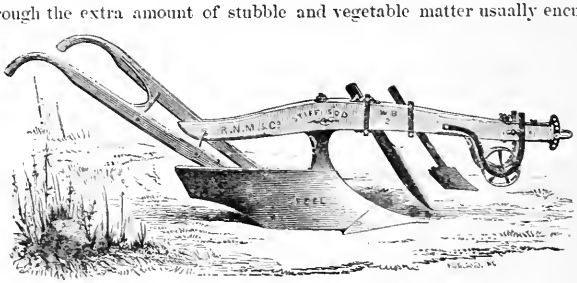

Fig. 12.— Boston Steel Clipper Plow W B 2.

bering the surface of rich, new lands. Its mould-board is finely adapted to the working of stiff clay sod land, in deep narrow furrows. It will plow seven inches deep, by ten inches wide in the most adhesive clay soil. It will take less depth or more width of furrow-slice, as may be desired. It is of easy draught for two oxen or a span of horses.

Boston Steel Clipper Plow U G 3 1-2, represented by Fig. 13, is a duplicate of cast-iron Plow No. 73½. The standard, however, is higher, and the land side lower than those of that plow, to fit it for use in the Western States. The plow is made with the "Peacock Coulter," for breaking

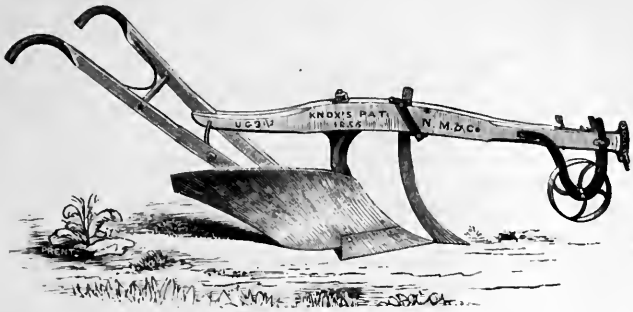

Fig. 13.—Boston Steel Clipper Plow U G 3 1-2.

prairie, as shown in Fig. 13, or with the circular cutter for the same purpose, or with the common straight cutter for ordinary sod plowing. It is a light plow, of easy draught for two or three horses. The mould-board is of that equal curvature which will cause it to polish brightly in any soil. This plow received the medal at the World's Fair in New York.

Boston Steel Clipper Plow U G 5 is constructed the same as U G 3½, but one size larger; it requires two to four horses.

Boston Steel Clipper Plow U G 4 is a duplicate of U G 5, but is left-hand.

Boston Steel Clipper Plow X 4 is a duplicate of Stubble Plow No. 33, of cast iron. It is used as a swing plow or with a wheel, and is made extra high in the standard, as it is specially designed for stubble or old land plowing; its mould-board is short, pulverizing the soil thoroughly and working deep. It turns a furrow-slice from five to ten inches deep, and ten to fourteen inches wide, and will polish bright and work free and clear in any soil.

It is of easy draught for two cattle or horses.

Boston Steel Clipper Plow X 4 1-2, as represented by Fig. 14, is made with Circular Cutter, or with "Peacock Coulter," if that is preferred, for breaking prairie; for ordinary sod plowing it is made with the

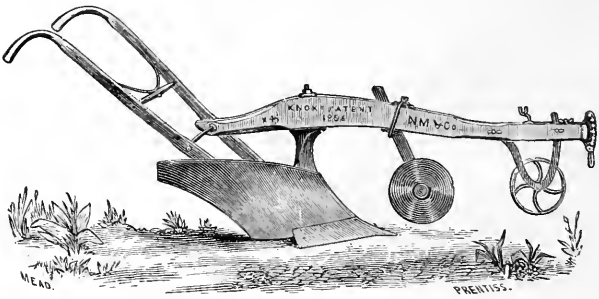

Fig. 14.—Boston Steel Clipper Plow X 4 1-2.

common straight cutter. Remove the cutter or coulter, and the plow is well adapted to old ground work. It requires two or three horses.

Boston Steel Clipper Plow X 3 is constructed like the preceding, but is of smaller size, intended for two horses, and will give entire satisfaction to those desiring a plow both for sod and stubble work.

Boston Steel Clipper Plow X 1 1-2 is next in size, adapted for plowing stubble or old ground, turning furrow-slices from four to eight inches deep, and ten to twelve inches wide, with two horses.

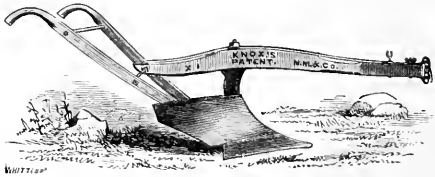

Fig. 18.—Boston Steel Clipper Plow X 1.

Boston Steel Clipper Plow X 1, represented by Fig. 18, is a one-horse plow, adapted to working adhesive soils from four to six inches deep, and nine to ten inches wide.

Boston Steel Clipper Plows X00 & X0 are both small, intended for use at the South in preparing the soil for and in cultivating cotton.

Boston Steel Clipper Plow X 8 1-2, represented by Fig. 15, is a duplicate of cast-iron Stubble Plow Eagle No. 32. It is made as a swing plow, or with a wheel, as may be desired. It is extra high in the standard, and is specially designed for prairie and old land plowing. It

Fig. 15.—Boston Steel Clipper Plow X 8 1-2.

has a short mould-board, is a thorough pulverizer and a deep worker, carrying furrow-slices from five to ten inches deep, and twelve to fourteen inches wide, and will polish brightly, and work free and clear in all soils. It is of easy draught for two cattle or horses.

Boston Steel Clipper Plow X 6, when fitted with the circular cutter, is intended for breaking prairie land, its extreme width especially adapting it for this kind of work. It turns furrow-slices six to nine inches deep, and twelve to fourteen inches wide, requiring two or three horses.

Boston Steel Clipper Plow X 6 1-2 is for the same purpose as X 6, but of larger size.

Boston Steel Clipper Sod and Subsoil Plow X 4, represented by Fig. 16, is a right-hand plow, and a duplicate of cast-iron Greensward and Subsoil Plow No. 31; for particulars of its working properties see description of that Plow, Fig. 8.

Fig. 16.—Boston Steel Clipper Sod and Subsoil Plow X 4.

Boston Steel Clipper Sod and Subsoil Plow X 7 is a left-hand plow, of size corresponding to the Sod and Subsoil Plow X 4.

Boston Steel Clipper Plow X 7, represented by Fig. 17, is a left-hand plow of same size as X 4 right hand, and adapted to the same purposes, requiring two or three horses.

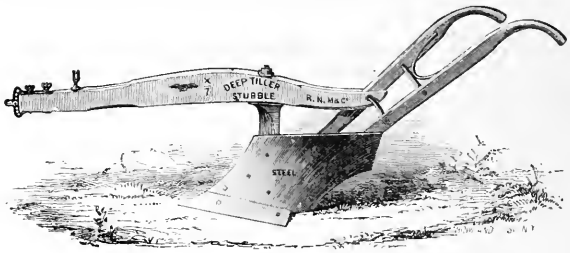

Fig. 17.—Boston Steel Clipper Plow X 7 (left hand).

Boston Steel Clipper Plow X 9, is a left-hand plow, smaller size than the preceding, and used with two horses.

TURN-WREST (SWIVEL) STEEL PLOWS,

FOR HILL-SIDE AND LEVEL LAND.

Turn-Wrest (Swivel) Steel Plow A 2 is a duplicate of A 2, of iron. The form of the mould-board is such that it will scour and clean in the most adhesive soil. It turns a flat furrow-slice from six to eight inches deep, by nine to twelve inches wide.

To provide for the necessary change of the position of the cutter when the mould-board is reversed, this plow is made with the movable cutter, which is quickly moved to the right or left.

The excellent work which can be done with this plow is attested by the numerous premiums which it has taken at various Ploughing Matches.

Turn-Wrest (Swivel) Steel Plow B 1 is of the same construction as A 2, but of smaller size, a duplicate of B 1, of iron.

IMPROVED BOSTON STEEL CLIPPER PLOWS.

These plows are an improvement on the Boston Clipper, in having the mould-boards made of such a form as to give greater disintegration of the furrow-slice, thus preparing the soil for receiving the seed.

We make three sizes, — X 1 1-2, X 8, X 8 1-2.

SESSIONS AND KNOX'S PATENT HARD STEEL PLOWS.

These plows are furnished in duplicate of Boston Clipper and Improved Boston Clipper, as ordered. Those made of ordinary steel, when hard enough to wear well, are invariably brittle and liable to break, and when soft are deficient in durability. These have extra qualities of hardness, as each piece of metal is made by a process which converts about one-third on each side into steel, and allows it to be hardened as much as fire and water can make it, while the centre remains flexible. This gives them a toughness that obviates all liability to breakage, and a surface better adapted than that of other plows to slide through the soil, reducing the amount of power required, and securing lightness and other good qualities combined. All our steel plows are now made of the Patent Hard Steel, as it has been found after practical use that it possesses all the desirable qualities claimed for it, and is every way superior to the cast steel formerly used.

EAGLE PLOWS.

While the *older patterns* of **Eagle Plows** do not, as a general thing, work so deep in proportion to size, and have not a capacity to carry so narrow furrow-slices in proportion to depth as the "Deep Tiller," yet they do the work for which they were designed in an accurate and highly-finished manner. They are very strongly made, and specially well adapted to the plowing of stony lands, and lands of a rough, uneven surface.

Plows of these patterns are in use largely in the United States and foreign countries, having been critically tested in various conditions of soil and cultivation, and for perfection of form, durability of material, and excellence of working properties are regarded by the public with much favor. A strong indication of their excellence and reputation is found in the fact that other plow-makers have attempted to imitate them in form, and then, by putting upon such imitations the same numbers and names as those on the original, have endeavored to pass them as the *genuine* **Eagle Plows.**

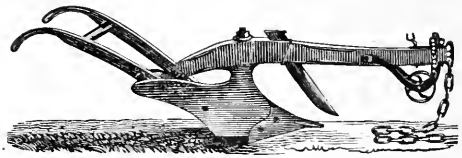

Fig. 19.—Eagle Plow No. 1.

Eagle Plow No. 1, Fig. 19, is called, at the North, a light sod or stubble plow, of easy draught for two horses or oxen. At the South it would be considered as requiring three mules in turning a furrow-slice six inches deep, and eleven inches wide, though this amount of work has often been accomplished with a pair of mules. It is made as represented in Fig. 19; or with lock-coulter, wheel, draught-rod, and dial-clevis, as in Fig. 20; or with fin share as in Fig. 21.

Eagle Plow No. 2, Fig. 20, is a size larger than Eagle No. 1, and is a medium-sized two-horse sod or stubble plow. It is adapted to turn sod-furrow-slices four to seven inches deep, by twelve to fourteen wide, and will work some deeper in stubble plowing. It is made with the lock-coulter,

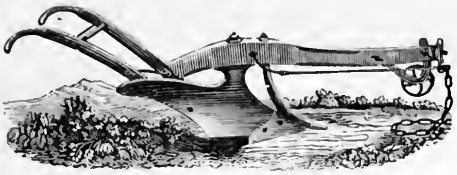

Fig 20.—Eagle Plow No. 2. Lock Coulter.

wheel, draught-rod, and dial-clevis as in Fig. 20, and with these fixtures is a very strong, and at the same time light plow for two cattle or horses, in plowing stony, stumpy, or rough, uneven land; or, it is made with wheel and cutter for flat furrow-slices in smooth land, as in Fig. 19. It is also made with wheel and fin share, like Fig. 21, which adapts it in best manner for stubble plowing.

Eagle Plow, Sward C, Fig. 21, is a trifle larger than Eagle No. 2, and is a plow for two or three cattle or horses, working from four to seven inches deep, by twelve to fifteen inches wide; when made with the fin share

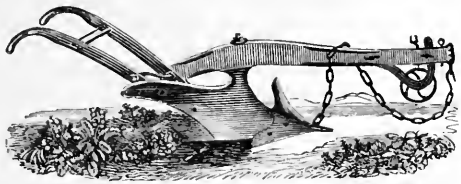

Fig. 21.—Eagle Plow Sward C. Fin Share.

and wheel it is well adapted to stubble plowing, or the plowing of rough or stony sod-land; when made with the wheel and inclined cutter, as Fig. 19, it is adapted for flat-sod furrow-slices.

Eagle Plow, No. 20, Fig. 22, is a very strong plow, requiring four cattle, adapted to deep, heavy work, having a mould-board of great turning power. It is rigged with wheel, draught-rod, and dial-clevis, for plowing sod nine to ten inches deep, with double teams; or, made with lock-coulter, wheel, draught-rod, and dial or quadrant clevis, as in Fig. 20, it is adapted to heavier work.

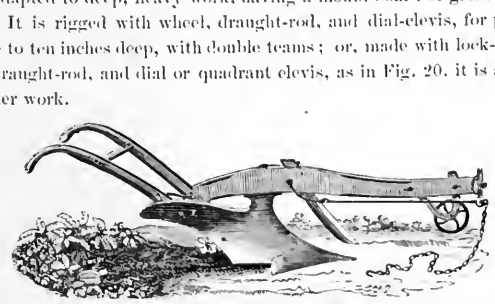

Fig. 22.—Eagle Plow No. 20.

Eagle Plow, No. 20, with Meadow Fixtures (complete), as represented by Fig. 23, is adapted to breaking up and reclaiming peat meadows or swamps. The meadow fixtures consist of the reversed or drag-cutter, the lock-coulter, a wide steel-edged share, and the draught-rod, with the dial or quadrant clevis. In plowing low peat meadows, or recently drained swamps, the tendency of the spongy sod is to gather in large

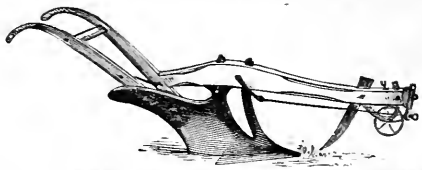

Fig. 23.—Eagle Plow No. 20. Meadow Fixtures.

masses before a cutter set in the ordinary way, and this difficulty is avoided by the use of the drag-cutter, as its position is such that it makes a drawing clean cut through the sod. The lock-coulter, steel-edged, being very strong and sharp, cuts off any roots, and clears a way for the plow through any obstacles below the reach of the drag-cutter, or which it may have failed to separate in its course through the sod.

The wide steel-edged share, with its sharp cutting edge, completely severs, to the extent of the entire width of the furrow-slice, the roots of any kind that may have reached as low as the bottom of the furrow. Thus, the spongy slice of meadow-soil, being separated by these various fixtures from the unplowed land on all sides, is readily taken up and completely turned over by the mould-board of the plow, and laid in a neat, finished manner.

The draught-rod, combined with either the dial or quadrant clevis, may be turned to the left of the plow-beam and wheel, so far as to permit the off-horses or oxen to walk upon the turf of the unplowed land, thus avoiding the difficulty and fatigue of travelling in the soft, miry furrow-channel; and it may be changed either to the right or left of the plow-beam to an extent enabling the plowman to run his plow close alongside a fence or ditch with room for the team to travel without crowding, and turn the slice from the ditch or fence.

Eagle Plow, No. 25, is about the same size as No. 20, and is usually trimmed as represented by Fig. 22; it is an excellent four cattle or horse sod plow, carrying furrows eight to ten inches deep, by sixteen to eighteen inches wide.

Eagle Plows, Nos. 46 & 47, Left Hand, are represented by Fig. 21. These are strong, powerful plows, for two or more horses, according to amount of work. They are made with common, plain cast shares, and are trimmed with the same fixtures as other plows.

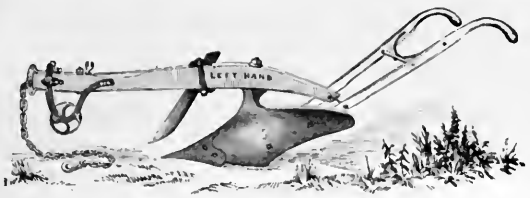

Fig. 24.— Eagle Plow Nos. 46 and 47 (left-hand).

EAGLE PLOWS,

WITH SELF-SHARPENING AND ADJUSTABLE STEEL POINTS.

(Fig. 25.)

These plows are of the same form and general construction as the other celebrated **Eagle Plows,** except that the point and share are made separate and upon an improved self-sharpening principle. The point, as shown detached at No. 1, Fig. 25, is simply a bar of steel and iron sharpened at each end, about twelve to fifteen inches long, which passes upward into the body of the plow, where it is confined with one bolt. As this bar is worn on the under side and becomes shorter it is readily moved forward and turned the other side up, thus always presenting a sharp point of *full length* and proper shape: when one end is worn off five inches the other end is placed forward and performs a like service. The wing, as shown detached at No. 2, is made of either wrought iron with steel edge, or of cast iron, and is also reversible, being used either end forward, or either side up. Both point and wing are so very simply constructed, that any blacksmith can replace them at trifling expense, or perpetuate the use of the original by new laying with steel as they become worn.

There is a cap of cast iron a little back and above the point, shown detached at No. 3, Fig. 25, which protects the shin or forward part of the mould-board, and is confined in its place by the same bolt that holds

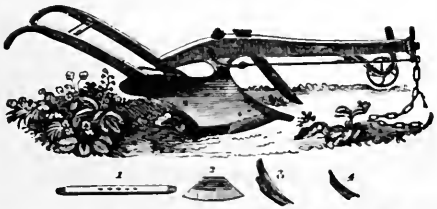

Fig. 25.— Eagle Self-Sharpener Plow, with parts detached.

the point, and is cheaply replaced when worn. This cap is sometimes made with a fin or coulter projecting from its upper edge, and is much less expensive, and, in many kinds of soils, quite as serviceable as a wrought coulter or cutter, as shown in Fig. 25.

These plows are particularly commended for Southern plantations, as the nearest blacksmith can easily repair them. Self-sharpening points and shares have been considered objectionable, inasmuch as they have not possessed sufficient strength, owing to their complicated *construction of cast iron*. But a single glance at these plows will convince any person, that, by the simple construction of the point and wing of wrought iron and steel, they combine strength and durability unequalled by any other form of construction, and that they are kept in repair at much less trouble and expense. The point can be used projecting more or less forward, causing the plow to incline more or less into the ground as different soils may require.

EAGLE SELF-SHARPENER PLOWS.

Of these we make six sizes.

Plow No. 0. — A small one-horse or mule plow.

No. 1. — A light one-horse plow.

No. 2. — A one-horse plow.

No. 3. — A medium two-horse sod plow.

No. 4. — A large two-horse sod plow.

No. 5. — A heavy sod plow, and is a very strong and an admirable implement for breaking up stony soil.

EAGLE SELF-SHARPENER LEFT-HAND PLOWS.

These are made to turn the furrow-slice to the left, and are constructed with the self-sharpening and adjustable steel point and wings, as described above. They are used in many parts of the West, principally by the German farmers. They are trimmed with the various fixtures used on the right-hand plows.

Eagle Self-Sharpener Plow, left-hand, No. 40, is a size suitable to be drawn by two strong horses.

Eagle Self-Sharpener Plow, left-hand, No. 41, is heavier, and larger size, designed to be drawn by three or more horses.

EAGLE PLOWS (SMALL).

These plows are of small size and different forms, and are adapted to various purposes as described: —

No. 14. — A light, single one-horse or mule plow, calculated to carry a wide furrow in a light or sandy soil, and well adapted to Northern or Southern culture.

No. 14 1-2. — The same size as No. 14, but has extra strong, heavy castings for rough, rugged or stiff soils.

No. 15. — A single horse or mule plow of same construction as above, but one size larger.

No. A 1. — A light, one-horse or mule plow, better calculated for a clay soil. It is much used among cotton or corn, as well as for furrowing out or drilling.

No. A 2. — A single horse or mule plow, same construction as above, but one size larger.

No. 1 B. — A large, one-horse plow, frequently used with two horses.

No. 2 B. — A small, two-horse plow, same as above, but one size larger. It is much liked at the North and South.

No. A. — A light one-horse plow.

No. O. — A size suitable for two horses at the South, or one at the North. It is of easy draught.

Davis 6-inch Cotton. — A light, one-horse or mule plow, particularly designed for the South in the cultivation of cotton.

Davis 7-inch Cotton. — Of nearly the same construction, but a size larger than above.

Rice Trenching Plow. — This plow is made from a pattern furnished by a Southern planter. It will do the work of many hoes in trenching a field for the rice crop, and will be found a great labor-saving implement. It is also used for opening drills for corn or cotton, and for various root crops.

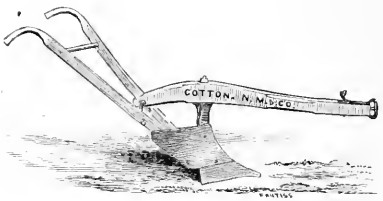

Fig. 26.—Steel Cotton Plow.

The Steel Cotton Plow, represented by Fig. 26, is a new plow recently invented to take the place of the small, cheap cast-iron plows, now commonly used by the planters of the South. The mould-board is of wrought iron or steel, and is ground and polished, which prevents the soil adhering as in the case of many of the old cast-iron mould-boards, and in this respect must recommend itself.

It has a cast-iron or steel point, which can be duplicated at all times at a small expense. The price of the plow is quite low, and when the fact of the length of time which the plow can be used is taken into consideration, its cheapness over the common Cotton Plows is apparent.

RIDGING OR DOUBLE MOULD-BOARD PLOWS.

Double Mould-Board Plow, No. 1 1-4, is a light, one-horse plow, used for opening drills to plant potatoes or corn. In plowing out between narrow rows it throws dirt both ways to the plant, and thus does the work of two plows. It is also useful in digging potatoes. It is a convenient implement for various kinds of work, and should be kept on every farm.

Double Mould-Board Plow, No. 1 1-2, Fig. 27, is similar in construction to the preceding, but is a size larger.

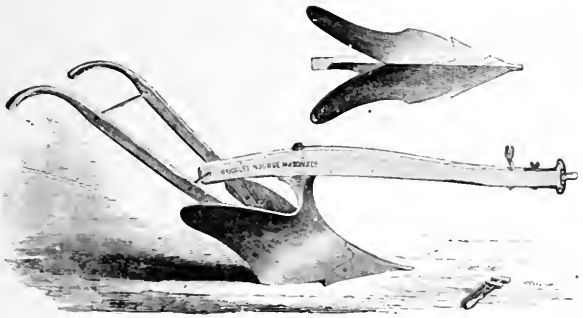

Fig. 27.—Double Mould-Board Plow.

Double Mould-Board Plow, No. 2, is of same construction and use as the preceding, but one size larger, and is used in furrowing for planting cane and in making light ditches; it has an extra point, made wide, for the purpose of digging potatoes.

WROUGHT FLUKE PLOWS

FOR

SUGAR CANE.

The plows described below are all designed for ridging in the cultivation of Sugar Cane. They differ materially in the manner of construction, and in the working surface of the mould-boards, for the purpose of adapting them to the various soils of the different countries in which Sugar Cane is raised.

Wrought Fluke Double Mould-Board Plows, Nos. 3, 4 and 5, are made with cast-iron standard and point. The form of the mould-boards is such that they are nearly in a straight line from the point to the heel; on their working surface they are slightly concave, with very little turning power, but they will act more as a scraper to press out the soil each side from the centre into ridges, being better adapted to loam than clay soil.

The mould-boards of these plows are spread out so that —

No. 3 is 17 inches wide at the base of rear end.
" 4 is 26½ " " " " "
" 5 is 31½ " " " " "

EXPANDING DOUBLE MOULD-BOARD PLOWS, WROUGHT AND CAST IRON MOULDS.

The plows described below are all designed for ridging in the cultivation of Sugar Cane. They differ materially in the manner of construction, and in the working surface of the mould-boards, for the purpose of adapting them to the various soils of the different countries in which Sugar Cane is raised.

Expanding Double Mould-Board Wrought Plows, Nos. 17, 18 and 19, are made with cast-iron standard and point; the mould-boards are of wrought iron, polished to look like steel, or of cast iron. To the mould-boards are attached two wrought arms, in the form of a quadrant, lapping each other so as to expand the plow more or less, secured in the centre by a set screw, which is easily adjusted.

The shape of the mould-board is different from the Nos. 3, 4 and 5 wrought fluke; they are concave, and made with greater turning power and inverting action, the ridge thrown by them being closely packed and somewhat conical in shape.

No. 17, when shut, is 12 inches wide at the base of rear end: when expanded, 17 to 18 inches.

No. 18, shut, 15 inches; expanded, 21 inches.

No. 19, shut, 17 inches; expanded, 24 inches.

Nos. 17 and 18 are made with cast-iron mould-boards, of convex form, similar to the Scotch Plows; they expand like those of wrought iron and pack the ridge nearly in the same form.

SIDE HILL

OR

TURN-WREST (SWIVEL) PLOWS.

(Fig. 28.)

Of this plow we manufacture seven sizes. It is so constructed that the mould-board is easily and instantly changed from one side to the other, which enables the operator to perform the work horizontally upon hill-sides, going back and forth on the same side, and turning all the furrow-slices downward. This prevents the washing of the soil by heavy rains, to which all hill-sides are more or less liable, when plowed up and down the slope. It is much liked at the South for *horizontal* plowing; for by this system of turning and laying the soil, it is prevented from being washed in those deep gullies so destructive to the general face of the country. It is likewise useful in enabling the plowman to turn the furrow-slice *from* his walls and fences.

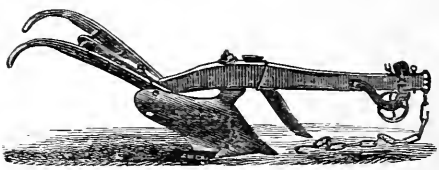

Fig. 28.—Side Hill or Swivel Plow.

No. 0 Side Hill.—A light, one-horse or mule plow, more particularly designed for *horizontal* plowing at the South.

No. 00.—A large, one-horse plow for the North, or suitable for two mules at the South.

No. B 1.—A light, two-cattle plow, for sod or stubble.

No. A 1 1-2.—A medium two-horse plow.

No. A 2.—A large, two-cattle plow, is sometimes used with three or four horses, according to the nature of the soil.

No. A 3.—A large, four or six-cattle plow, made very strong. It is suitable for heavy farm or road work.

No. 4, Heavy Road Plow, is represented by Fig. 29. It is made very strong, and is especially designed for the roughest road work, being of a size and capacity to do work requiring the draught of four to eight

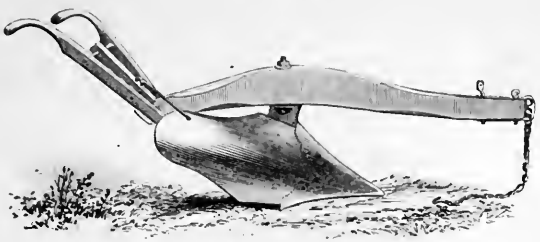

Fig. 29.—Side Hill or Swivel Plow, No. 4 (heavy road).

cattle. It is extensively used for road making and repairing, and for such purposes is purchased by towns and districts, and they find it a great labor-saving implement, and an economical investment. It will break the ground, and give the general shape to a road in the newest or most difficult soil, plowing among roots, stumps and stones without breaking. For the annual repair of roads it is most valuable, as it will speedily and with great facility open the ditches, and furnish earth with which to form the road-track.

SUBSOIL PLOWS.

The deeper disintegration of the soil has long been admitted as a desirable mode for general adoption, and some experimenters have concluded that no depth is too great which can be practically attained. In particular districts, however, where the surface-loam was shallow and the subsoil too heavily charged with clay, it was found not beneficial to reverse the position of the soil, placing the clay on top, but that the disturbance of the clay in place, without elevating it, was advantageous; thus the digging a trench, and afterwards filling it up, first with the clay, and then replacing the surface-soil, caused the crops to be much greater, not only immediately over the trench, but for a considerable distance on each side. The use of a subsoil plow at all is of comparatively recent date.

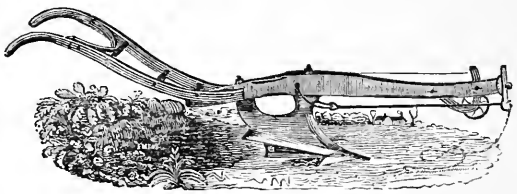

Fig. 54. — Subsoil Plow.

The first **Subsoil Plow** ever seen in the United States was imported in 1840 by our predecessors, Ruggles, Nourse and Mason, from Scotland. Although an effective implement, it was too complicated and costly to suit the American farmers; and from this pattern the importers made a plow of equal capacity, but much lighter, of simpler construction, and better adapted to practical use.

The real object of plowing is not to turn an immense quantity of soil without disintegration, but rather to change the relative position of its particles. With the ordinary Surface Plow, the force of the team is exercised in all directions, in lifting and turning the furrow-slice through the arc of a circle with but slight disturbance of the soil. When plowing deeply, at every foot of travel about one hundred pounds of soil is lifted through a long continued line, and a large amount of power is consumed. The removal of each particle of soil but a small fraction of an inch in its relation to the surrounding particles is said to be as thorough cultivation as lifting it a foot high, and placing it back again on the surface.

The Subsoil Plow follows directly after and in the furrows made by the Surface Plow, and changes the position of the lower soil to any desirable depth, by merely raising it a slight distance without turning it. It disintegrates all the way to the surface, under-cutting both the land side and the furrow-slice without useless friction, lifting them very much as the mole does, when travelling beneath the surface, and causing much greater pulverization than many surface plowings would accomplish. That part which moves through the soil occupies little space, and resembles a thin wedge, slightly varying in thickness in the different kinds.

Subsoiling prevents plants from suffering from drought in dry seasons, by enabling the roots to extend deeply into the soil, and gives lightness and warmth to the soil in wet seasons by causing the excess of moisture to filter below the surface. It is specially valuable in lands where the top soil rests upon hard-pan, that is, a few inches below the surface: also in stiff, clayey or other tenacious soils, as by its use the hard-pan or stiff under-soil is opened and pulverized, so as to promote the ascent of moisture from below, and enable the roots of vegetation to extend downwards.

It enables thin seeding to produce as large crops as thick seeding produced before; it also gradually enriches the subsoil and makes it equal to the surface. Those who run a Surface Plow to the depth of nine to ten inches, and a Subsoil Plow, capable of disintegrating, to the depth of nine or ten inches beneath the bottom of the surface-furrow, can almost say that they have discovered another farm beneath that represented on their map.

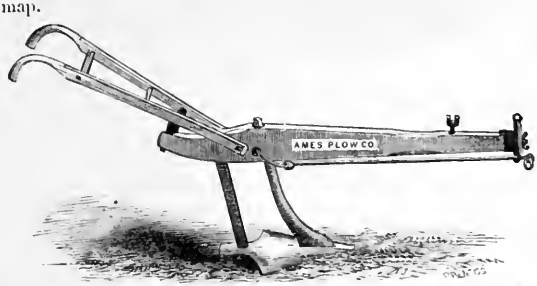

Fig. 31.— Mapes' Lifting Subsoil Plow, wrought iron and steel.

Mapes' Lifting Subsoil Plow, wrought iron and steel.— This plow, represented by Fig. 31, is made of wrought iron and steel; the points are not reversible, but can be sharpened or new laid by the blacksmith. It is found to double a sod corn crop, by passing after the Sod Plow, to loosen the unturned soil, and allow the roots to spread freely. The following are the sizes: —

00 Subsoil. — Works from five to nine inches deep; for light horse.

O Works from six to ten inches deep; for one horse.

A Works from ten to fourteen inches deep; for two cattle.

B Works from twelve to sixteen inches deep; for two or three cattle.

C Works from fourteen to eighteen inches deep; for four cattle.

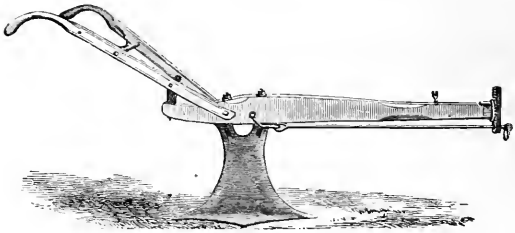

Fig. 32. — Mapes' Reversible Subsoil Plow.

The Mapes' Reversible Subsoil Plow, represented by Fig. 32, is made of cast iron, in two sizes. The smaller size, marked A, works from twelve to fourteen inches deep; for three cattle. The other, marked B, is larger, working from twelve to fifteen inches deep; for four cattle. Its effect is to disintegrate the soil at considerable distance each side as it passes, with greater ease, and in a better manner, than the Subsoil Plows, which raise the soil higher as it leaves it more disintegrated, and less in lumps, admitting the light and air more completely and equally. The standard and share, being the same in rear as in front, can be reversed when worn.

THE PARING PLOW.

The Paring Plow, represented by Fig. 33, is used for paring turf-lands preparatory to burning. The share is thin and flat, made of wrought iron, steel-edged. It has a lock-coulter, and short coulters on the outward edge of each wing of the share, cutting the turf, as it moves along, into two strips, each about one foot wide, and as deep as required.

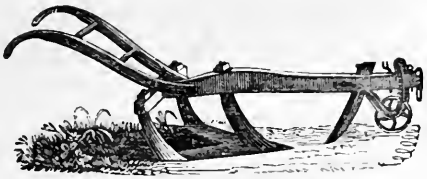

Fig. 33.— Paring Plow.

After the turf is pared off in strips, men follow with sharp spades and cut it into suitable length, say of two or three feet. These pieces are then thrown into heaps, and, after drying, are burned, and the ashes spread broad-cast on the land. Paring and burning is a very ameliorating process for stiff clay-soils; it changes their mechanical texture, and renders them friable and suitable for cultivation. It is always furnished with wheel, and, *if required*, with the drag cutter, as shown above.

THE HAKES PATENT

TURN-WREST (SWIVEL) PLOW,

FOR LEVEL LAND AND HILL SIDE.

The Hakes Patent Turn-Wrest (Swivel) Plow, represented by Fig. 30, is considered not only the best implement of the kind, but as likely to work an important revolution in the structure of plows and in plowing. The inventor had two desirable objects in view, both of which are conspicuous in its construction. It has been long felt that there was a necessity for a plow which would more thoroughly pulverize the soil, leaving it light and open and aerated by the atmosphere, as it is left by the use of the spade: and, also, that that could only be effectually accomplished by a Swivel Plow, which would do its work without the dead furrow which is left by the common land-side plow. These two objects the inventor has triumphantly accomplished; by an improvement in point and mould-board, which

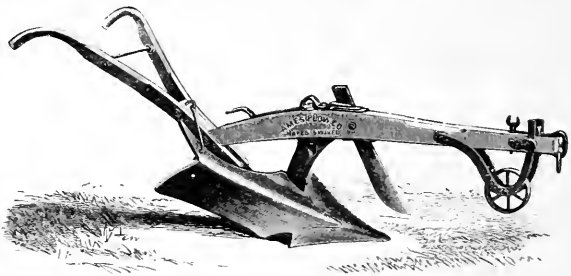

Fig. 30.— The Hakes Patent Turn-Wrest (Swivel) Plow.

enables the plow not only to turn and cover as perfectly, and perform as handsome work, as the most approved now in use, but by its peculiar form the furrow-slice is pulverized to the greatest degree, as near to spade-cultivation as the most advanced agriculturist could desire.

The fact that Turn-Wrest or Swivel Plows heretofore made do not take land enough, has caused the plow-makers to devise various means of relief; but none have proved effectual except the simple remedy adopted in the construction of this plow, which consists in making the standard base or land-side of the plow narrower at the back than it is at the front end. By this device the beam of the plow is thrown off from the land, either to the right or left, accomplishing the same result as shifting the clevis on the

ordinary land-side plow, when it is desirable to take more width of furrow. All other Swivel Plows being set in the centre refuse to take land enough: but this plow "lands" the same as all land-side plows. The land-side or upright edge of the share is thrown past the centre of the beam, as the plow is turned to the right or left; therefore it becomes necessary, when a cutter is used, to move it from right to left, and *vice versa*, as the plow is changed, so that it shall be, as nearly as possible, in a line with the land-side of the share. This is provided for by a movable cutter, which may be quickly changed as the plow is reversed.

Thus this Turn-Wrest or Swivel Plow possesses a combination of advantages, which commends it to universal adoption. Heretofore the Swivel Plow has been chiefly used on side-hill land, not being adapted to a level surface, owing to the defects mentioned. As this plow, however, effects the complete inversion and pulverization of the soil on level land, as well as uneven surfaces, it will be a relief to the eye, tired of the unsightly, oblong "lands" and dead furrows made in ordinary plowing, to see the uniform, pulverized seed-bed left by this plow, as it turns to the right and left in its easy, graceful progress over the field.

It possesses symmetry, durability, and simplicity, giving a full-width furrow, completely inverted and pulverized, and as porous as any implement can leave the soil. It works equally well in rocky, or smooth, or wet clay land, the peculiar form of the mould-board preventing it from clogging, or holding on to the soil.

SCOTCH-AMERICAN PLOW.

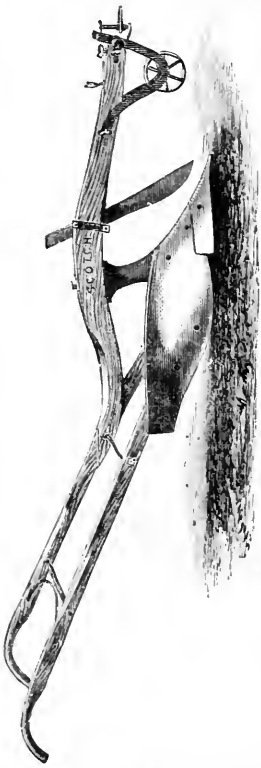

Fig. 11.— Scotch-American Plow WB 2.

The Scotch-American Plow WB 2, represented by Fig. 11, is made in the most substantial manner of patent hard steel, the outer surface being hardened to the extreme degree of hardness, while the centre remains flexible. This imparts a toughness which obviates all liability to breakage, and a smooth surface which enables it to glide through the soil easily, thus reducing the draught, and increasing the durability.

The peculiarities of the Scotch Plow — its long handles and extended bearings — give it a steadiness in the furrow not possessed by any other plow. It is particularly adapted to large fields and long bouts, and it is difficult to persuade a genuine Scotchman that so thorough a tillage can be accomplished by any rival implement. For turning greensward and handsome lap-furrows it has no superior; the draught is light, and the plow is handled by the workman with ease. On large fields free from boulders and stumps, where there is full sweep for the long handles, the popularity of this plow increases in proportion to its use.

It will be noticed that this plow has a screw clevis, which, for convenience and accuracy, greatly excels the common clevis, and its general introduction would save much annoyance to plowmen.

PROUTY & MEARS'

CENTRE-DRAUGHT PLOWS.

These plows are of easy draught, turning the sod most perfectly, and in a clear, free soil preserve the furrow without a holder; and, if the ground is in good condition for plowing, will nearly prepare it for seed. By their peculiar shape and turn of mould-board, they will pulverize and disintegrate the particles of the furrow-slice, and consequently aid in the proper aeration of the soil and decomposition of organic matter, and thus liberate food for plants from the soil. In results they are nearly equal to spade husbandry, which has been termed "the perfection of good culture."

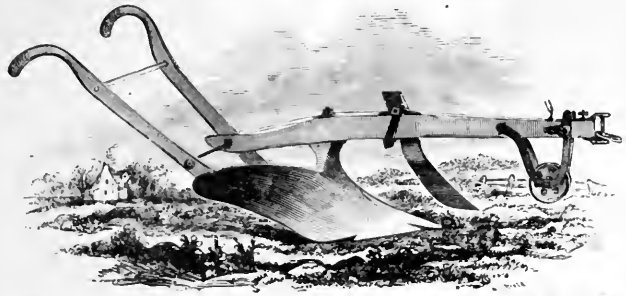

Fig. 34.— Prouty & Mears' Improved Centre-Draught, No. 155.

Improved Deep-Tilling Centre-Draught Plow, No. 155, represented by Fig. 34, is deservedly popular among farmers. The admirable principle of *Centre-Draught*, the result of careful experiment suggested by extensive and scientific investigation, renders it a most valuable implement for every kind of service to which it can be applied.

By receiving the resistance of the furrow-slice equally on both sides, the line of draught being in the centre, the plow "lands" properly, and is drawn straight forward with a regular and steady motion, and naturally keeps its true position. It is managed with such ease and comfort to man and team that one man and a yoke of oxen are quite equal to the task of breaking up new land in a common soil — a saving of labor which will soon amount to the *first cost* of the plow.

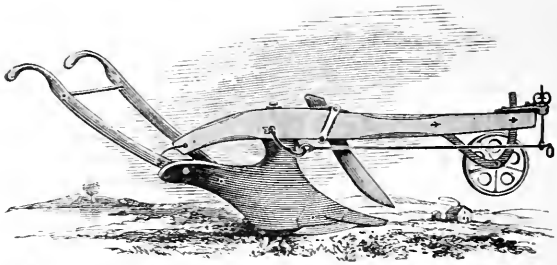

Fig. 35. — Prouty & Mears' Improved Centre-Draught, No. 5 1-2.

The Centre-Draught Plow, No. 5 1-2, represented by Fig. 35. possesses an extraordinary combination of excellences. The point or share presents a gradual, easy rise of the furrow-slice to the mould-board, which is on a gentle spiral curve in its transverse and diagonal sections, and of such length as to insure a free and easy delivery of the furrow-slice at its after end, and not requiring the foot of the plowman to prevent its falling back, and having the cohesion of its particles so far disturbed as to admit of the genial influences of the sun and rain, those powerful agents of decomposition. It is of that peculiar structure which is so well adapted to the form, which the under side of the furrow-slice naturally assumes, in the process of being inverted, that after a few hours' service not an inch of the mould-board will remain unpolished.

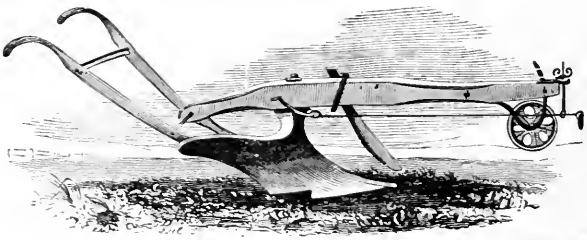

Fig. 36. — Prouty & Mears' Improved Centre-Draught, No. 25.

The Centre-Draught Plow, No. 25, represented by Fig. 36. is one of a series of Centre-Draught Sward or Grass Plows, which were intended to carry out and demonstrate that well-known principle "that spade labor is the perfection of husbandry." The peculiar structure of the mould-board or ground-wrest being such, that while the furrow-slice is detached from the land in the best form (the rhomboid) it is carried over its winding surface with only a moderate exertion of power on the part of the team: having the arrangement of its particles disturbed, their cohesion

destroyed, and the mass, in a light and friable condition, inverted and laid off by the side of the last furrow-slice, completely covering all loose and vegetable matter found on the surface, thereby bringing about the desired result in a most satisfactory manner.

The Improved Midland Plow, No. 6, represented by Fig. 37, is a double mould-board plow of the largest size, calculated for the gathering and distributing of ridges, in the cultivation of root-crops, and harvesting potatoes, but especially designed for the forming of back-furrow ridges on grass or sward land, where manure has been spread upon the surface; this is done by throwing two furrow-slices nearly together, and enclosing the manure and vegetable matter in such a manner as to form a seed-bed most desirable for corn and other crops — a practice successfully introduced into some sections of the country.

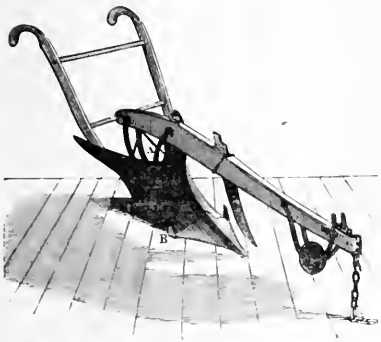

Fig. 37. — Prouty & Mears' Improved Centre-Draught, No. 6.

This plow is furnished with a wheel at the fore end of the beam; it has a larger wheel under the after end of the beam, as seen at A, which serves as a land-side, on which it is supported while in action, and by means of which it is with ease carried round the ends of the land, and from place to place; the coulter, suspended from the beam, dividing the furrow-slice from the surface downward into two parts. The cutters seen at BB, near the tip of each wing of the share, and extending upwards some three inches, separate the divided and ascending furrow slices from the solid land on either side, and enable the plow, by the peculiar form of its mould-board, to place the furrow-slice thereon with ease and regularity.

The width of work may be varied or adjusted by the cutters from eighteen to twenty-four inches; in other words, two furrows may be laid off, from nine to twelve inches in width each, and from five to seven inches in depth.

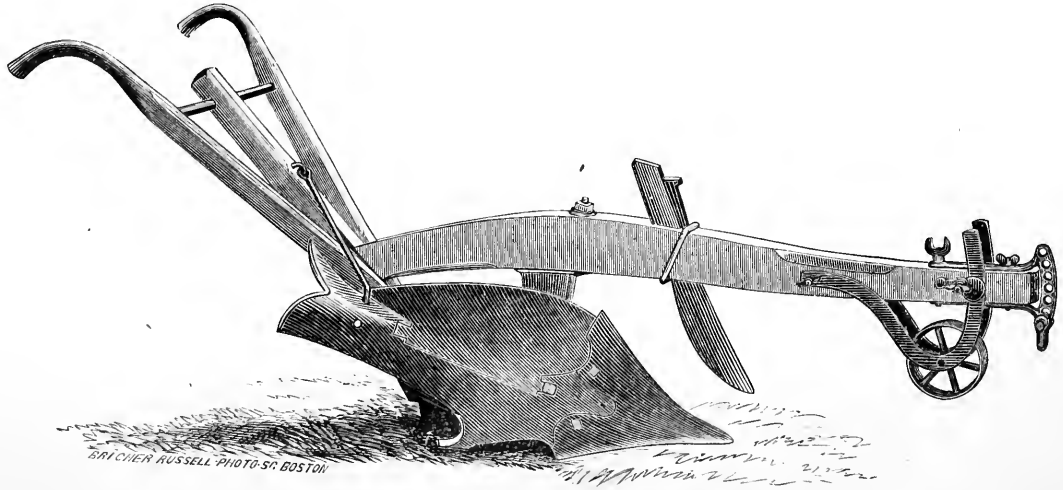

Fig. 38.—Sanborn's Improved Turn-Wrest (Swivel) Plow. Side Hill or Level Land.

SANBORN'S

TURN-WREST (SWIVEL) PLOW.

Sanborn's Improved Turn-Wrest (Swivel) Plow, represented by Fig. 38, has an adjustable wing to prevent the furrow-slice from running over the mould-board.

No. 1.—Intended for plowing greensward, turning a flat furrow, and working from five to seven inches deep, and nine to twelve inches wide—drawn by two cattle.

No. 2.—One size larger, for three cattle.

THE SKINNER GANG PLOW.

The Skinner Gang Plow, represented by Fig. 39, is a perfect and complete Gang Plow, adapted to any soil. Three or four horses can be worked abreast, one in the furrow and the others on the land; the point of draught can be placed wherever necessary to accommodate the team. There is no side or down draught on the pole. The Plow can be run deep or shallow, and changed in an instant, without stopping the team, clearing itself in any ground. The out-end of the axle can be quickly raised or lowered at pleasure, according to the depth of the furrow.

Every farmer who runs two common plows will find, except in rough, stony land, that this Gang Plow soon pays for itself in the saving of wages.

This Plow is made with the Patent Castor or Adjustable Circular Coulter, which always draws in line of draught and never gets out of place: with this coulter it is the best Corn-stalk Cutter in use, for by bending the stalks down with a pole and crossing them with the Gang Plow, they are cut, and from five to six acres per day plowed, covering the stalks completely.

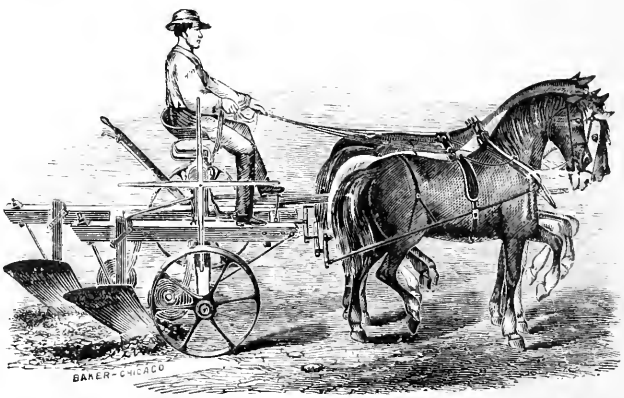

Fig. 39.—The Skinner Gang Plow, with Castor Coulter.

CUTS AND EXPLANATIONS

OF THE

VARIOUS PLOW TRIMMINGS.

The Wheel. — Several advantages are realized by the use of the wheel attached to the plow, particularly in turning sod; the plow is drawn at a convenient distance from the team; its movements are steady and regular, and of uniform depth, promoting the ease of both plowman and team.

Fig. 40. — Wheel, side of beam.

Fig. 41. — Wheel, under beam.

The wheel is placed on the side of the plow-beam, as shown in **Fig. 40**; or under the beam, as shown in **Fig. 41.**

In either case the wheel-frame is secured to the beam in a manner that readily admits of raising or lowering the wheel to give the plow any desired depth of work; and, when adjusted to a given point, and there made fast by tightening the clasp, the plowing will be of uniform depth throughout.

The Cutter. — This is an important appendage to the plow in turning the sod. It separates the furrow-slice from the main land by an easy, smooth cut, securing a true edge and uniform width to the slice, and a highly finished style of plowing, with a saving of draught to the team. Without a cutter the furrow-slice would be torn off the land by the breast of the plow, its edges would be bristling and ragged, its width irregular, and its inversion by the mould-board would not be at all times so sure. A vessel is directed and controlled by its rudder, and so is a sod plow by its cutter; hence the importance of its correct adjustment, for very much in proportion as it is improperly set will the plow work improperly, notwithstanding its capacity in other respects to do nice, finished work.

When a particular style of plowing is desired, such, for instance, as lapped or flat, the set of the cutter must be for that kind of plowing, or the desired work will not be accomplished. The following cuts will assist to illustrate this point: —

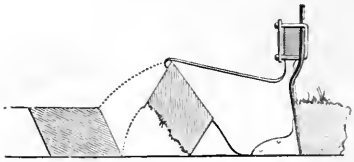

Fig. 42.— Cutter, inclined.

The Cutter, *set for plowing flat furrow-slices*, is represented by Fig. 42. It should stand as much inclined towards the mould-board side as the land-side of the plow does, and it is generally best to incline it even a little more, in order to obtain that bevelled edge of the furrow-slices so essential to their sure and finished matching, side by side, as they come from the plow, and to do *perfectly flat* work.

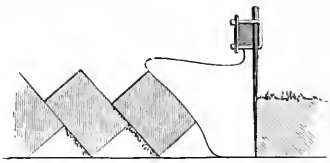

Fig. 43.— Cutter, straight.

The Cutter, *set for plowing lapped furrow-slices*, is represented by Fig. 43. It should be set to cut rectangular furrow-slices, and a perpendicular edge of the unplowed land, thus insuring high-crested lapped work.

The cutters are made either of a flat bar of wrought iron, steel-edged, or of thin circular plates of steel, and are variously adjusted to the plow-beam as follows: —

Fig. 44.— Cutter (Flat Bar) side of beam.

Fig. 45.— Cutter (Flat Bar) through beam.

These Cutters made of a flat bar, and clasped to the side of the beam, are shown by Fig. 44; those passing through the beam, and fastened by a gripe and key, are shown by Fig, 45; those made of a thin, circular plate, revolving on its own axis, with the stem or shank clasped to the beam, are shown by Fig. 46.

Fig. 46.—Circular Cutter.

Fig. 47.—Lock Coulter.

The forward inclination of the **Cutter** may be greater or less at pleasure; though, in some conditions of the soil and sod, it is best quite raking, for the edge will thereby the better free itself of the loose roots and stems that may double over and remain upon it. The adjustment of the cutter to the beam is such as readily to admit of its being raised or lowered, set more or less raking forward, or its edge turned to or from the land at pleasure.

The Lock Coulter, represented by Fig. 47, is made of wrought iron, steel-edged. It passes through the plow-beam, and is made fast on top with a key, and locks through the share and mould-board where they join together. The adjustment is a very strong one, both for the coulter and plow, and adapts the implement for work among stones, stumps and roots, as the coulter cannot be turned out of place, or broken by such obstacles.

Fig. 48.—Skim Coulter.

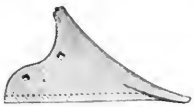

Fig. 49.—Share.

The Skim Coulter, represented by Fig. 48, is usually placed a few inches forward of the cutter, and the stem or shank is attached to the beam by an iron clasp with nuts and screws to make it fast. The Skim-Coulter promotes highly finished plowing, particularly that of lapped sod. It shaves off the grass edge of the furrow-slice, and the turf, thus taken off, is carried over on the turning slice till it drops into the furrow-channel and is buried. The edges of the lapped slices are thus freed of the sod; consequently no grass springs up, and as they are jointed to an equal thickness they are laid with great precision.

The Share, represented by Fig. 49, is made of cast iron or wrought iron steel-edged, or wholly of steel; if of cast iron, the entire cutting edge and the point is hardened in casting by a process of chilling, which forms a

very hard surface, the effect of which is constantly to produce a sharp, thin, cutting edge, of great advantage in plowing, and to insure three times the service in the share that would otherwise be obtained. The extent of the case hardening is indicated by the dotted line back of the edge of the share.

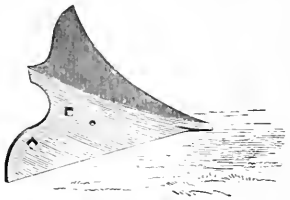

Fig. 50.—Fin Share.

The Fin Share, represented by Fig. 50, is useful for plowing sod lands infested with roots and stumps or stones, where the sward cutter cannot be used without danger of being bent or misplaced. It is also very useful when plowing-in stubble or coarse manure, serving to keep the plow from clogging at the standard. It separates the furrow-slice from the unplowed land easier and smoother than it could be done by the breast of the plow.

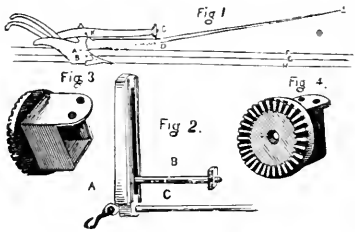

Fig. 51.—Dial Clevis.

The Dial Clevis, represented (in detached parts) by Fig. 51, is used to vary the point of attaching the chain or motive power, thereby obtaining a steady, easy and uniform motion of the plow, running at different depths of furrow. With the *Common Clevis* sufficient variation cannot be obtained; for instance, if properly attached to work six inches deep, the chain at the end of the beam must be raised considerably to work well at 12 inches deep, and carried to the right in order to acquire more width of furrow-slice. But the *Dial Clevis* can be instantly adjusted to any degree of nicety, and is capable of greater variation than any other kind, without in the least endangering the strength of itself or the other parts of the plow.

In explanation of the detached parts shown in Fig. 51:—

Fig. 1 shows the Dial Clevis and rod attached to plow, the position of the plow in operation, and the line of draught.

A, Fig. 2, shows the guide or movable plate which is confined across the end of the beam. B, Fig. 2, shows the joint bolt and nut which hold the guide to the end of the beam.

C, Fig. 2, shows a section of the draught-rod passing through the guide, and to which the power is applied. Figs. 3 and 4 show the cast-iron cap fitting the end of the beam, and through which the bolt passes, and to which the guide is confined by means of a bolt, and the cogs or teeth on it fitting into ribs upon the guide.

Fig. 52. — Quadrant Clevis.

Fig. 53. — Common Clevis.

The Quadrant Clevis, represented by Fig. 52, affords a wide range to the earthing or landing of the plow, and is generally used in connection with the draught-rod on subsoil and other plows where extra deep, heavy work is to be done. By loosening the nuts of the screw bolt of the clevis, through which the draught-rod passes, the line of draught may be raised or lowered, turned on or off the land, and more or less depth or width of furrow may be given the plow to any desirable extent.

The Common Clevis, represented by Fig. 53, is of wrought iron.

STYLE OF FURROW-SLICE.

We give illustrations of the appearance of the different furrow-slices, as turned by the most approved plows, which are represented in the preceding pages.

The Flat Furrow-slice is represented by Fig. 55.

The long, easy flexure and gradual twist of the furrow-slice, turned by the Improved Flat Furrow, Greensward Plows, secures lightness of draught, and promotes highly finished plowing in smooth land.

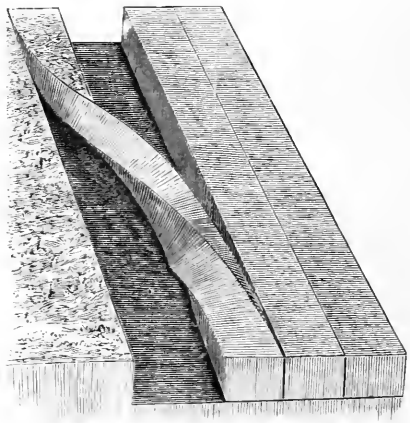

Fig. 55.— Greensward Flat Furrow-Slice.

The Lapped Furrow-slice is represented by Fig. 56.

The plows used for this work are specially adapted for stiff, clayey greensward, and lap the furrow-slices one upon another at an inclination of 45°. The projecting angles of the furrow-slices present the greatest possible surface of soil to atmospheric influences, and the spaces underneath serve as drains to relieve the surface of superfluous moisture.

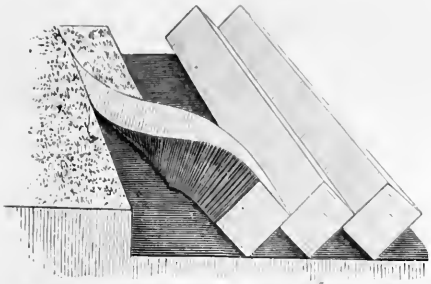

Fig. 56. — Greensward Lap Furrow-Slice.

The Stubble Furrow-slice, represented by Fig. 57, is obtained by the use of the Stubble Plow; the elevating and turning power of the mould-board is quite apparent in the sudden and high twist of the furrow-slice; and its capacity for breaking up and pulverizing the soil is remarkable.

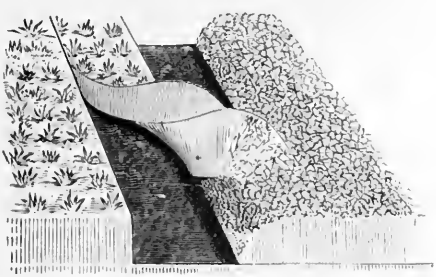

Fig. 57. — Old Land or Stubble Furrow-Slice.

HARROWS.

A well-constructed harrow is an important and effective implement in fitting the soil for the reception of seed, by breaking up clods, disengaging roots, and pulverizing the earth.

Great improvements have been made within a comparatively recent period in the construction of the harrow, by which a more perfect pulverization of the ground and a great saving of time and labor are secured; so that no one need use the old clumsy and coarse harrow of former days, when the latest improved styles can be obtained.

The following are of ascertained utility: —

The A Harrow consists of three frame pieces of wood, with teeth attached, joined together in the form of the letter A, and is the cheapest and simplest we make. It is made of five sizes, adapted to light or heavy work, and is in very general use.

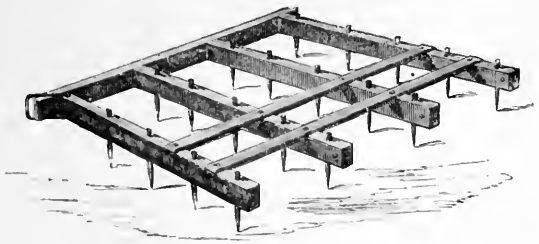

Fig. 108. — Common Square Harrow.

The Common Square Harrow is represented by Fig. 108. The teeth are fastened to the frame by nuts, and the bars are bolted together in such a manner as to secure ample strength. There are two sizes, eleven and fifteen teeth.

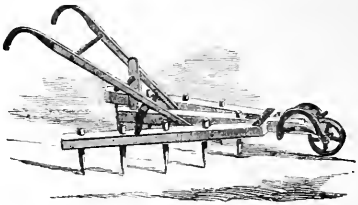

Fig. 109.— Cultivator Harrow.

The Cultivator Harrow, represented by Fig. 109, is made with handles, and the frame is so arranged that the width can be easily varied; it is furnished with a wheel by which the depth of working can be regulated. It is used in cultivating between rows of potatoes or cotton, or for light harrowing.

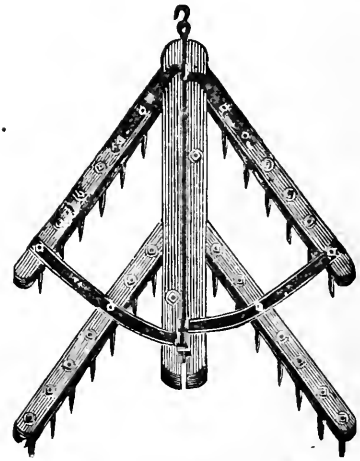

Fig. 59.— Geddes Harrow.

The Geddes Harrow, represented by Fig. 59, is made of two pieces of frame-work, joined by hinges in the centre, so that it adapts itself to an uneven surface, and either side may be conveniently elevated to free it from stones or sods, while the harrow is moving, without disturbing the operation of the other half, and one part may be folded upon the other in passing stones, or between stumps and trees.

The arrangement of the teeth in the frame-work is such, that each one operates distinctly from others, and the number of impressions made on the soil will be equal to the number of teeth and at equal distances.

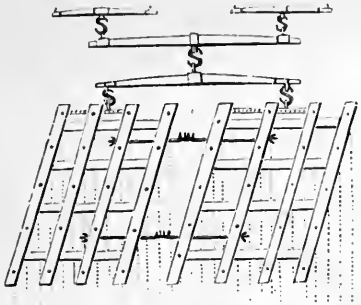

Fig. 60.—Scotch Harrow.

The Scotch Harrow, represented by Fig. 60, is a modification of the common square harrow; it is made with 32 or 40 teeth, inserted in such manner that each tooth forms a separate track, as shown by the dotted lines. The hinges, as in all square harrows, enable it to fit a rolling or uneven surface.

For the fine pulverization of a smooth surface this harrow is very desirable, and is used particularly for seeding or for light lands.

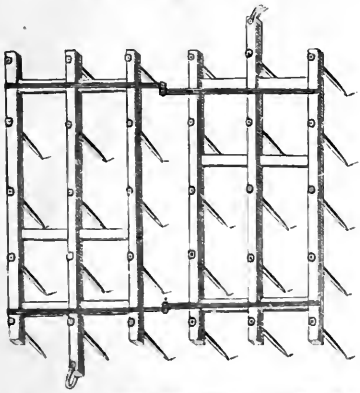

Fig. 61.—Improved Hinge Harrow.

The Improved Hinge Harrow, represented by Fig. 61, may be folded or separated into two parts for convenience of transportation, or other

purposes. Either half may be lifted while the implement is in motion, and the easy and independent play of the parts up and down upon the hinges enables the instrument to adapt itself to the surface of the ground in all places, so that, whether going through hollows or over knolls and ridges, it is always at work, and every tooth has a hold upon the soil. The teeth stand equi-distant, and wide apart, so that, while from their number and arrangement the ground is worked fine, they are not liable to clog. The teeth, when dull, may be sharpened by hitching the team to the opposite end.

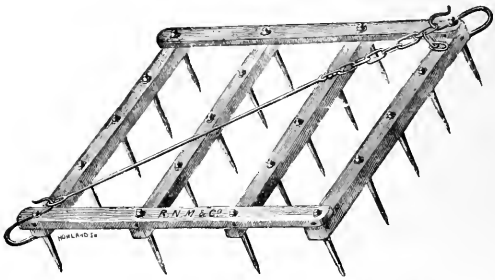

Fig. 62.—Expanding and Reversible Harrow.

The Expanding and Reversible Harrow, represented by Fig. 62, is so constructed as to admit of being widened or narrowed to do coarse or fine work. The two bars, on top of the frame-work, are connected with the four under bars by the outside teeth, the upper parts of which are rounded and shouldered, with nuts and screws on the top, and on which the entire frame swivels or turns in expanding and contracting, which is done simply by shortening or lengthening the chain on top. Thus the harrow is made any desirable width, and to work the soil to any degree of fineness.

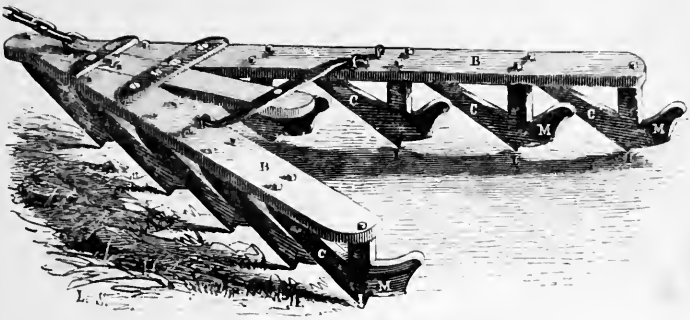

Fig. 63.—Shares' Harrow.

Shares' Harrow represented by Fig. 63, is the most perfect of all implements for pulverizing the freshly inverted surface of sward land to a depth two or three times as great as the common harrow can effect. The teeth, being sharp, flat blades, cut with great efficiency; and as they slope like a sled runner, they pass over the sod, and instead of tearing up like the common harrow or gang plow, they tend to keep it down and in its place, while the upper surface of the sod is sliced up and torn into a fine, mellow soil.

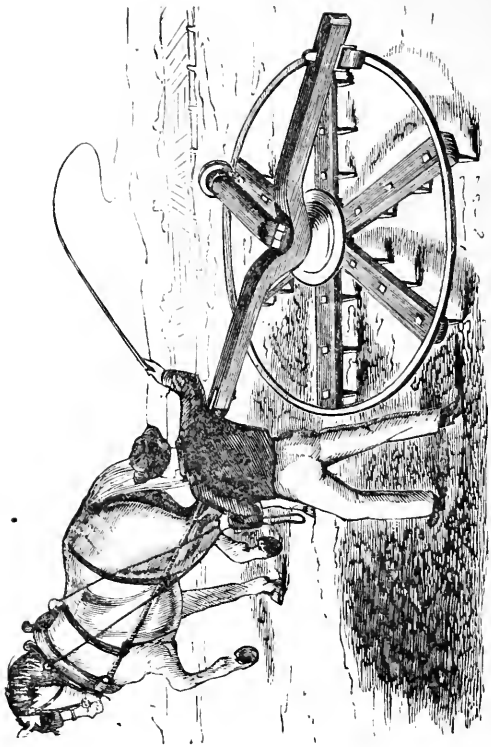

Fig. 64.—Monroe's Rotary Harrow.

Munroe's Rotary Harrow, represented by Fig. 64, is so constructed, that the rise and fall is independent of the beam; it inclines upward in passing over a ridge, and downward in passing down, not only doing the work much better, but lessening the strain.

The teeth in this harrow are attached by an improved method, the shank of each tooth, or the part resting in the wood, being provided with a set of adjusting notches, through any one of which a transverse bolt passes, secured by a head and nut. This allows the projection of the teeth to be increased or diminished at pleasure, as may be required for different grounds. This harrow readily clears itself from stones and sods.

SEED SOWERS.

SEED SOWERS.

The importance of proper implements for sowing seed and planting should not be undervalued. When we consider the great labor of sowing seed in drills by hand, together with the unsatisfactory result or irregularity in line and in depth, the seed sower is indeed a time and labor-saving machine.

Its economy is not dependent upon these alone; for as every seed will be planted at the proper depth and in the proper place, less seed is required than for hand-sowing, while the labor and expense of their after culture is materially lessened.

There will be found several kinds adapted to the different varieties of seeds.

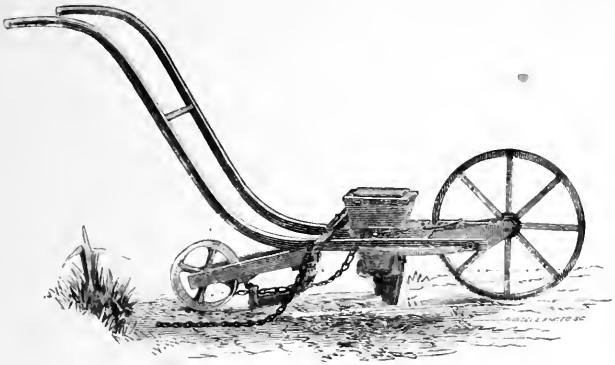

Fig. 68.— Harrington Seed Sower.

The Harrington Seed Sower, represented by Fig. 68, sows all kinds of seeds, and is the best in the market for carrot, onion, sorghum and turnip seed, also for pease and beans; it is the only one that will sow beets and parsnips with regularity. It makes the drill, drops and covers the seed evenly, and at the same time the chain marks the next row at the required distance. It has no slides, reeds or brushes to get out of order, but the dropping of the seed is regulated by means of the dial plate, which can be moved to make the holes larger or smaller, adapted to the size and quantity of seed to be sown.

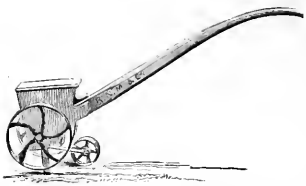

Fig. 69.—Seed Sower, No. 0.

Seed Sower No. 0, represented by Fig. 69, is a small hand drill, designed for the garden; it is a cheap, light sower, well adapted to the wants of those who cultivate root and vegetable crops on a limited scale, and will sow all such crops except pease and beans. It opens the ground, sows the seed, covers and rolls it at one operation.

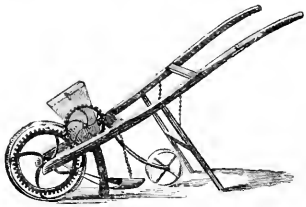

Fig. 70.—Seed Sower, No. 1.

Seed Sower No. 1, or **English Drill,** represented by Fig. 70, is a size larger than No. 0, though designed for sowing the same kind of seeds in the garden and field. The brush cylinder within the hopper is worked by gearing, and thus is always sure to operate.

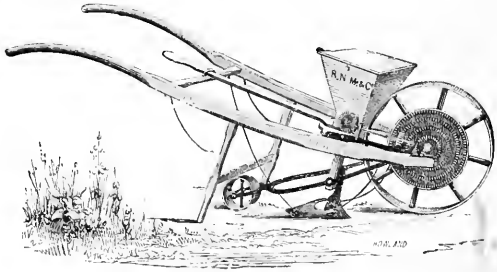

Fig. 71.—Seed Sower, No. 2.

Seed Sower No. 2, represented by Fig. 71, combines several important improvements upon the English drill, particularly in those additions

which fit it for sowing large seeds. The brush and cylinder (shown at D and C, Fig. 72) which distribute the seeds, are worked by graduated rows of iron cogs or gearings, which operate simply and uniformly, are durable, and not liable to get out of order. The brush is used for small seeds, and the cylinder for corn and beans.

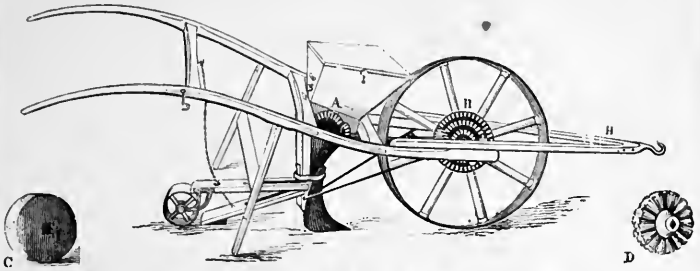

Fig. 72. — Seed Sower, No. 3.

Seed Sower No. 3, represented by Fig. 72, is adapted to hand or horse power, and to sowing seeds continuously in drills, or planting them in hills. By change of cylinders (shown at C and D) it sows or plants large or small seeds. The gearings, for the purpose of producing a rapid or slow motion, in order to adapt the machine to different kinds of seed, are simple, yet excellent; made of iron, they are durable, and work with regularity and precision.

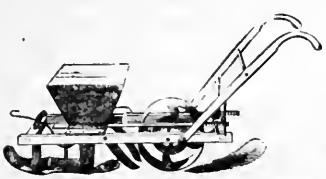

Fig. 73. — Billings' Corn Planter.

The Billings Planter, with Fertilizing Attachment, represented by Fig. 73, is made to be drawn by one horse for planting corn, beans, and other seeds, and dropping fertilizer at the same time. It is of durable and simple construction, not liable to get out of order, and easily operated; it is adapted to work with certain and good effect on stony and sward land, as well as on mellow interval or other smooth land. The hopper above the beams is made with two apartments, one for the seed, and the other for the fertilizer. By a very simple but sure arrangement of the working parts, it may be gauged to drop any desired quantity of seed

and of fertilizer with it, at any distance apart, in hills or in drills, of equal depth: the seed being dropped in the furrow opened by the share below, falling through the rear or hollow standard of the share to the bottom of the furrow, and the fertilizer, at the same instant, being dropped through the same hollow standard, and deposited with the seed; the curved iron blades, directly in the rear of the share, cover the seed and fertilizer to the desired and a uniform depth; and the broad wheel, by which the machine is moved, rolls or presses the soil down upon the seed much more uniformly than is ever done by the hand hoe.

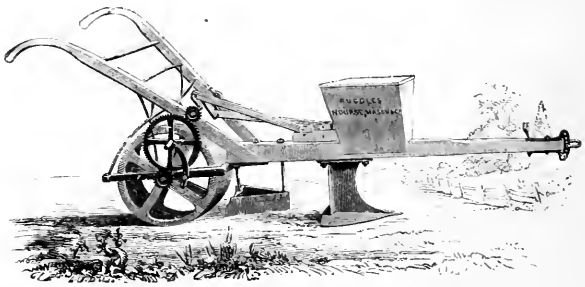

Fig. 74.—Batchelder's Corn Planter.

Bachelder's Corn Planter, represented by Fig. 74, is one of the best machines for planting corn. The seed is put into the hopper above the beam, and as the horse moves along, the share below opens the furrow; the corn is then dropped by arms moving horizontally; these arms have holes that can be altered to a proper size for receiving any required number of grains, and as they pass in and out of the hopper, the holes are filled with seed, which is dropped into a tube conducting it to the bottom of the drill made by the share. A triangular iron follows to remove all lumps and stones, and a roller to compress the earth over the seed. The dropping of the seed is always visible to the operator, and the arms are made to drop the corn nearer or further apart by using the different-sized wheels; it will plant from eight to ten acres per day.

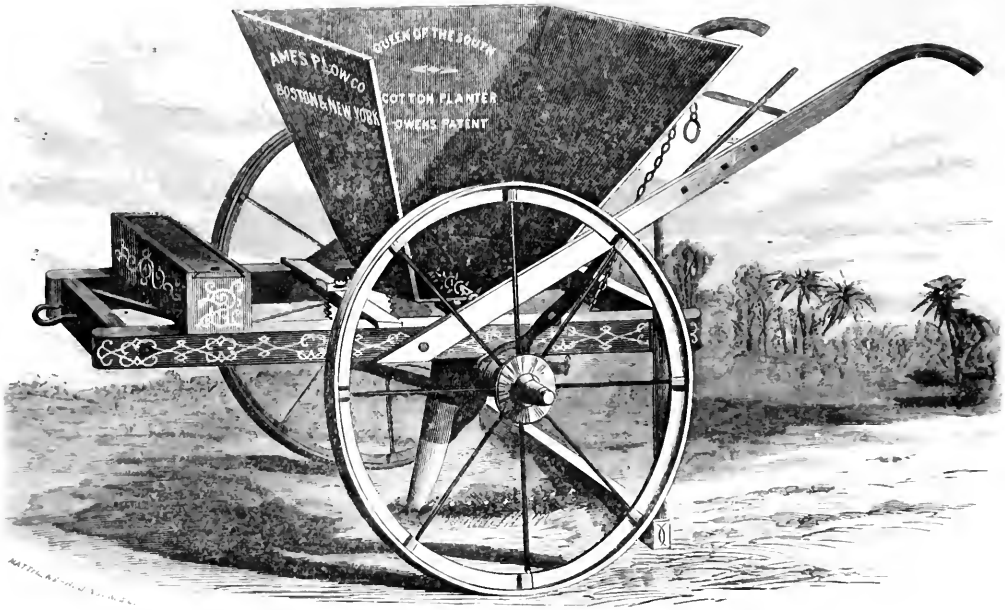

Fig. 81.— Queen of the South Cotton-Seed Planter.

Queen of the South Cotton-seed Planter is represented by Fig. 81. The difficulties encountered in attempts to plant cotton seed by machinery arise from the peculiar nature of the seed, which always has adhering to it a portion of short cotton fibre, which causes the seed to form a more compact mass when a quantity is brought together, than wheat or other kinds of grain.

The principles embraced in this machine render its operation practical, as the revolving tooth cylinders in the bottom of the seed-hopper, moving in opposite directions, prevent the seed from compacting in the hopper; consequently it is planted with perfect regularity.

Fig. 82.— Wells' Seed Sower.

The Wells Broadcast Grass Seed Sower, represented by Fig. 82, is of such simple construction that any person of ordinary tact can at once operate it perfectly, sowing any desired quantity of seed to the acre, and distributing it very much more evenly and rapidly than is possible to do by hand in the common way. In early spring, more or less wind frequently interferes with the proper broadcast sowing of seeds; but by using this sower, and carrying it low on the body, the seed may be put on the ground quite evenly, as the seed will reach the ground so directly as not to be much diverted, if any, from its proper resting-place.

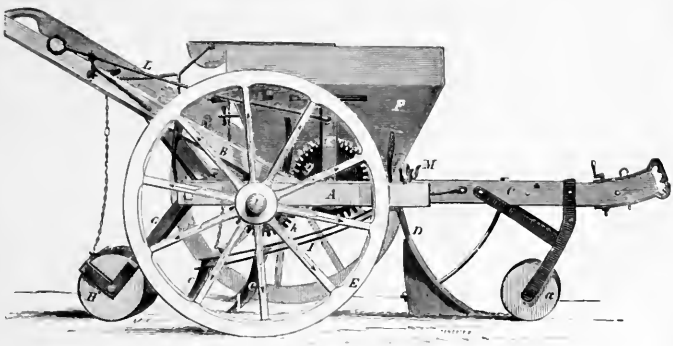

Fig. 83.— Garrett's Alabama Cotton and Corn Planter.

Garrett's Alabama Cotton and Corn Planter, represented by Fig. 83, is a very desirable machine, and with one hand and a horse or mule will do the work usually requiring four hands and two horses. Owing to the earth being pressed close to the seed, which greatly facilitates its germination, a stand of either cotton or corn is secured much earlier than by the ordinary mode of planting.

It is so arranged that the seed can be distributed in the quantity desired, and the cotton seed can be used in planting, as it comes from the gin without preparation. The machine can be readily altered to plant corn or pease. The arrangement for covering is very perfect and the machine is constructed in a strong manner.

ROLLERS.

FIELD ROLLERS.

The Field Roller is used on plowed land to level and smooth it after sowing down to grass, forcing sods and small stones into the soft ground, pressing the light, loose soil of the surface around the seeds of grain and grass, securing a sure and quick germination and growth of the seeds, and preparing a smooth, even surface for the reaper, mower, scythe and rake. In spring there is frequently great advantage in rolling lands recently sown to grass, as the land that has been uplifted by the frost, exposing the roots of plants, is replaced by the operation, with benefit to the growing crop.

The roller is particularly advantageous on light lands, composed of soil too loose and porous to retain moisture and protect the manure from the effects of drying winds and a scorching sun, and too light to allow the roots of plants a firm hold in the earth; for on such lands its compressing effect, especially in dry seasons, very much increases the product of crop, as well as preserves the manure from undue evaporation, thus saving a greater portion of its fertilizing properties for the benefit of the land and succeeding crops.

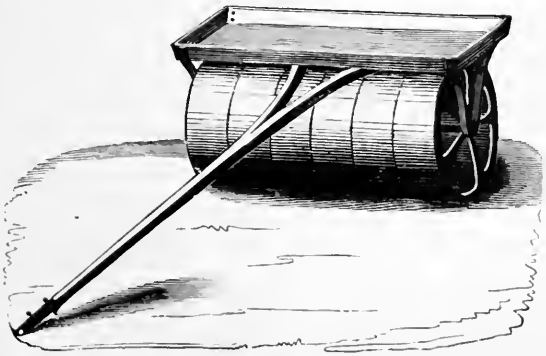

Fig. 84.—Iron Field Roller.

The Iron Field Roller, represented by Fig. 84, is a very strong, durable implement, constructed of iron, excepting the tongue and box, which are of wood. It is made in sections, each one foot long, and embracing any number from three to six, as may be desired. The sections are placed on a wrought-iron arbor or axletree, on which they each revolve independently, so that in turning the roller at the ends of the field the ground is not left uneven. If not more than four sections are required, shafts may be substituted for the tongue, and the roller drawn easily by one horse. The tongue and shafts can both be furnished to be used as required. The box is attached to receive stones picked up on the field, and for giving extra weight to the roller when needed. For distant transportation, the iron sections and standards, to which the wood-work is attached, are furnished to order, either with or without the wrought-iron arbor, by weight, and the wood parts can be made and fitted by any wheelwright or carpenter.

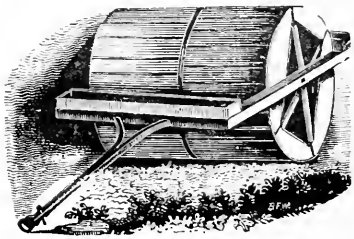

Fig. 85.— Wooden Field Roller.

The Wooden Field Roller, represented by Fig. 85, is made in two sections of about 2½ feet long, and larger in diameter than those made of iron. The box to receive stones rests on the frame-work in front.

The Garden Roller is represented by Fig. 86. The cylinder is cast in parts, 15, 20, 24 and 28 inches in diameter, and 7½ to 20 inches long. To the arbor, inside the cylinder, is attached a counter-balance, which adds weight to the instrument, and causes the handle to stand perpendicular when not in use.

Fig. 86.—Garden Roller.

Crosskill's Clod Crusher, represented by Fig. 87, an English machine, is made like an ordinary roller in sections, with the following differences: Each section is but three inches wide, and they are kept from touching each other by a washer on the main shaft; each alternate section has an opening or hole in the centre fitting the shaft, while those between are of increased diameter, and have openings an inch larger than the shaft; these latter revolve eccentrically, instead of concentrically as the former, and any lumps or clods received between the rollers are sure to be rubbed to pieces, for the rollers are not only toothed on their face, but at their sides. It may, with propriety, be called a pulverizer and presser.

Fig. 87.—Crosskill's Clod Crusher.

In England it is claimed that, by its use, larger crops of wheat are obtained; that the ruffled edges of these wheels compress the earth in vertical masses toward the seed, and at the same time divide all lumps so as to prepare the soil for the free circulation of the atmosphere, as well as compressing it in vertical portions against the seed.

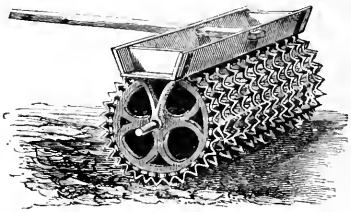

Fig. 88.—American Clod Crusher.

The American Clod Crusher, represented by Fig. 88, is modified from the English machine. It is used where heavy clay soils prevail.

CULTIVATORS.

CULTIVATORS.

Cultivators are of various kinds, but all partaking of the same general principles, being intended to be drawn by one horse, or some for use by hand for garden culture. The cultivator is used between the rows of crops, such as corn, potatoes, root crops and cotton, though it is frequently employed to pulverize the ground preparatory to seeding, and for this purpose is every way superior to the harrow as to results. It is also used for covering the seeds of grain.

When intended to work between rows, it is constructed to expand or contract according to the width. In its various modifications, the cultivator exterminates grass and weeds much more effectually than the hand hoe, leaving them on the surface to be wilted by the sun, and at the same time pulverizing the surface soil, rendering it light and friable, fully prepared to admit dews and rains, and to be acted upon by atmospheric influences, promoting the growth of plants, and saving hand labor.

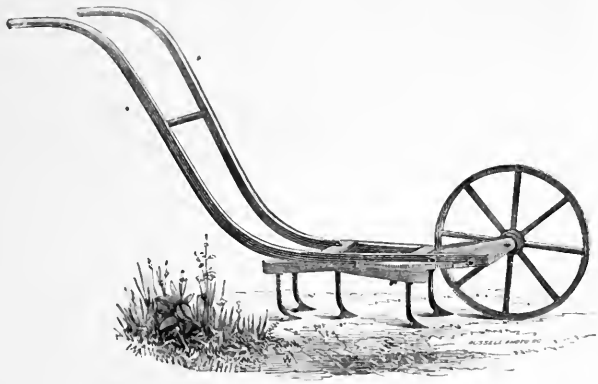

Fig. 89.—Harrington's Hand Cultivator.

Harrington's Hand Cultivator, represented by Fig. 89, destroys weeds between the rows, and mellows the soil; it can be easily expanded, and dispenses with wheel and hand hoes. It is a very useful implement in garden culture, and is often used in fields, among rows of carrots, beets and onions, where there is not sufficient width to use a horse, and performs the work better and faster than many men with hoes, leaving the ground well pulverized, and the weeds cut up. By removing the frame with teeth it is quickly changed to the Seed Sower.

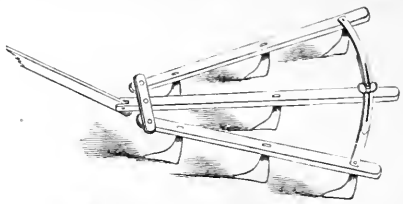

Fig. 90. — Hand Cultivator.

The Hand Cultivator, represented by Fig. 90, is made entirely of iron, except the handle, and expands from ten to eighteen inches.

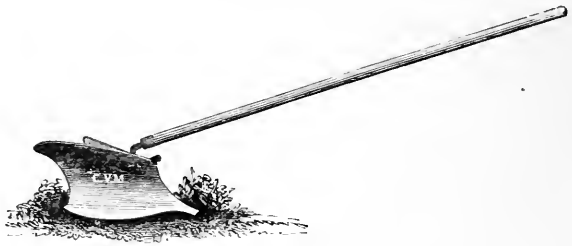

Fig. 91. — Hand Plow.

The Hand Plow, represented by Fig. 91, is very useful in small gardens, and is preferred by many for the hand cultivation of onions and other crops in rows. It is made of cast iron, highly polished; the share and mould are fitted in such a manner that the depth of furrow can be easily regulated.

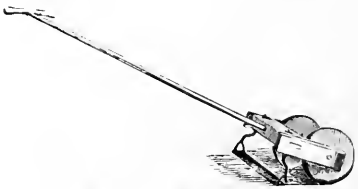

Fig. 92. — Wheel Hoe.

The Wheel Hoe, represented by Fig. 92, consists of a pair of light small wheels, to the axle of which the tongue or handle is attached. The blade or hoe is attached to the handle, and is made to work the earth, to a greater or less depth, by raising or lowering the handle; it is extensively used in some sections in the cultivation of onions and various root crops, and saves the farmer and gardener the unpleasant labor of weeding in a stooping position.

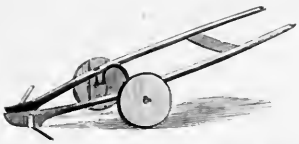

Fig. 93.— Goodwin's Onion Weeder.

Goodwin's Onion Weeder is represented by Fig. 93. Every gardener knows the importance of weeding as closely as possible to the rows of vegetables, in order to lessen the cost of hand-weeding. Many implements, made for this purpose, are very high priced; this is furnished at a low price. This weeder has one decided advantage over others: it not only cuts each side of the row, but also half way across between the rows.

Fig. 94.— Improved Expanding Cultivator.

The Improved Expanding Cultivator, represented by Fig. 94, is made of the same form and size as the ordinary cultivator, but the teeth are of an improved form, which gives greater effect than those of the common expanding cultivator in thoroughly pulverizing the soil.

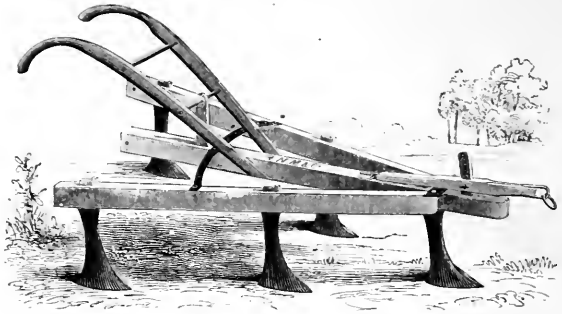

Fig. 95.—Common Expanding Cultivator.

The Common Expanding Cultivator, represented by Fig. 95, is the ordinary form, with teeth of cast iron, made with or without the front wheel. The wheel, however, is found to be a great improvement, as it causes the implement to move more steadily and at even depth, and assists the operator to turn at the ends of the rows, and to avoid obstructions.

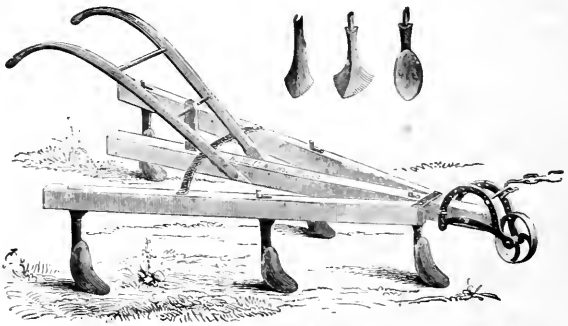

Fig. 96.—Expanding and Reversible-Tooth Cultivator.

The Expanding and Reversible-Tooth Cultivator, represented by Fig. 96, is a highly approved implement: the points or shares of the teeth are made of steel or cast iron, fastened to the shank or standard by bolts or nuts, so that either kind of shares may be used on the same standard, cheaply replaced when worn, and one substituted for the other. The shares being also reversible, are thereby very enduring, for when one end is too much worn to be effective, they may be changed to the other end down, and a double amount of service obtained. The different teeth used are represented and furnished separately.

Fig. 97.—Parallel Expanding Cultivator (three teeth).

The Parallel Expanding Cultivator, Three Teeth, represented by Fig. 97, is made with the teeth standing in the same relative position to the line of draught, whether the frame is expanded or contracted, and always works in a direct line forward. Both cast-iron and steel shares are made to fit the standards, and are fastened, by bolts and nuts, so that new ones can be substituted. The teeth have high standards, elevating the frame-work so far from the ground as to prevent the instrument from clogging with sods.

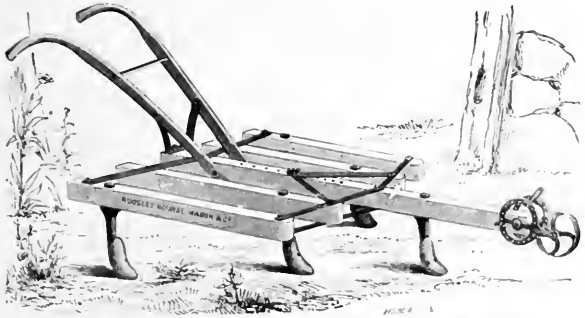

Fig. 98.—Parallel Expanding Cultivator (five teeth).

The Parallel Expanding Cultivator, Five Teeth, represented by Fig. 98, is of construction similar to the preceding one, except that the frame is longer and wider, to receive five teeth and take a greater breadth of surface in working. It is rigged with teeth like those in the preceding, or with steel reversible teeth as represented.

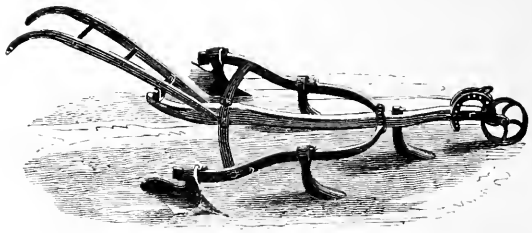

Fig. 99. — Universal Cultivator.

The Universal Cultivator, represented by Fig. 99, is made long, and all of iron, except the centre beam and handles; the side beams are of wrought iron, so curved that, as they are expanded or contracted by loosening the iron keys that confine the teeth in their places, the latter are moved forward or back to a point, that will again cause them to work parallel with the centre beam, and at equal distances from the others.

There is also one pair of moulds calculated to work in the rear, in form like small plows, throwing the earth in opposite directions, and fitting alike both side beams; they may be placed to throw the earth to or from the centre, or rows of vegetables. If the forward teeth are used at the same time, they finely pulverize the soil, and if the plows are set to turn inwardly, a beautiful light bed is formed in which to plant any seed. It is furnished with three teeth and two moulds, or with five teeth.

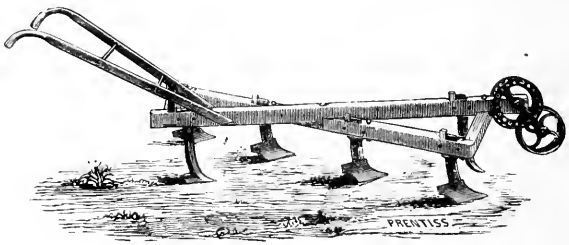

Fig. 100. — Knox's Gang Cultivator.

Knox's Gang Cultivator, represented by Fig. 100, is a combination of the Horse Hoe and Gang Plow. The beam, to which the team and the handles are attached, is placed in the line of draught of the instrument, and has the coulter or curved tooth of the horse hoe forward, and a tooth with a double share in the rear for the purpose of balancing the cultivator.

Another beam, placed diagonally to the draught or to the first-named beam, contains a row of small steel plows, each cutting and covering a breadth of earth of about seven inches, inverting and pulverizing the soil to the depth of one, two, or four inches, and raising a fine tilth.

The instrument is perfectly balanced, so as to run straightly and steadily, and is easily managed in passing trees and stumps, and over rocks or large stones. For covering grain or preparing surface soil for crops of any kind, and covering compost manure, it is often preferable to the harrow. For one horse it is made with four small plows; for two horses it is made with six plows, and corresponding increase in length of beams.

HORSE HOES.

HORSE HOES.

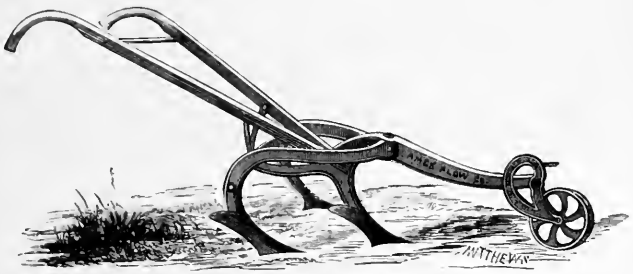

Fig. 101.—Boston Horse Hoe.

The Boston Horse Hoe, represented by Fig. 101, designed for market gardens, and the culture of corn and root crops, is a complete pulverizer, and mellows the surface of plowed land preparatory to putting in crops. It mixes manure with the soil, and cannot be clogged or choked with weeds, stubble or sods; it works well on hard and compact, rough or stony land, and is very effective in destroying twitch grass. It does the work of a cross-plow or harrow in preparing land for grass, without turning up the old sward. It is constructed with a strong, light iron frame and improved plows or moulds; the rear plows are reversible, so as to throw the earth to or from the plants. It can be contracted to fifteen inches in width, and expanded to thirty-six inches, and is ganged to work any depth from three to seven inches. A pair of larger rear plows for hilling are furnished when ordered.

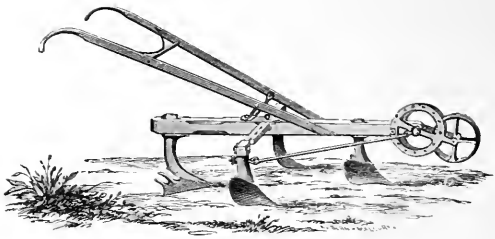

Fig. 102.—Howe's Expanding Horse Hoe.

Howe's Improved Expanding Horse Hoe, represented by Fig. 102, is light, easily managed, pulverizes and mixes the surface, and is consequently highly destructive to weeds and grass. The improvement consists in adding *parallel expanding bars*, so that it may be worked as wide or narrow as desired. The side teeth are also supported by a rod, connected with the front part of the hoe, thereby giving them permanency, and without any wearing of the socket that holds the tooth to the bar.

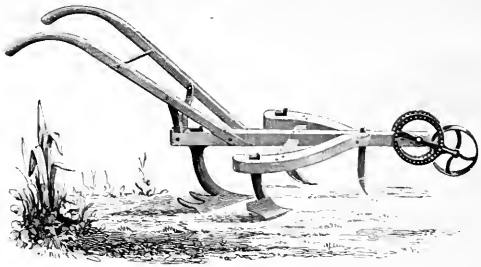

Fig. 103.—Knox's Horse Hoe.

The Knox Horse Hoe, represented by Fig. 103, designed for the hoeing or cultivation of corn, the various root crops, cotton, hops, young nurseries and hoed crops generally, is quite light, easily managed, and the small size of light draught for a horse or mule; it is a thorough pulverizer of the surface soil and exterminator of weeds and grass. The forward tooth is simply a coulter, to keep the implement steady, and in a straightforward direction: the two side or middle teeth are miniature plows, which may be changed from one side to the other, so as to turn the earth from the rows at first weeding, when the plants are small and tender, or towards them in later cultivation; the broad rear tooth effectually disposes of grasses and weeds, cutting off or rooting up all that come in its way, sifting the earth and weeds through its iron fingers in the rear, leaving the weeds on the

surface to wilt and die, and the ground level and mellow. There are three sizes, small, medium and large.

Knox's Carrot and Cotton Weeder, represented by Fig. 104, is an adaptation of the Horse Hoe, Fig. 103, for the cultivation of these crops. The forward tooth is simply a coulter to balance the hoe and keep it in a straight course. The rear tooth has a broad steel share, spreading in all to the width of twenty inches, or ten inches each way from the centre, — the cutting edge being on an easy angle backward and outward from the point, adapted to make a clean and easy cut.

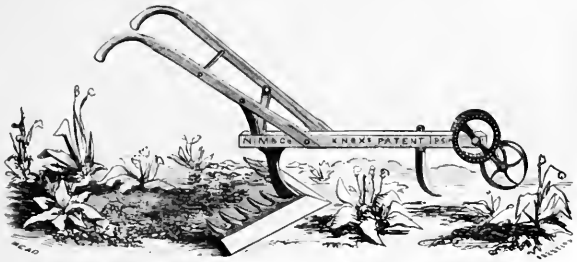

Fig. 104. — Knox's Carrot and Cotton Weeder.

The tooth has also prongs or fingers on each side, above and back of the steel share, which are of iron, formed on a gentle upward curve, so that the soil lifted by a broad share is combed or harrowed on the under side by the fingers, the weeds being sifted out and left on the surface to wilt and die, and the earth reduced to a mellow tilth. A broader or narrower rear tooth may be used on this instrument, according to the width of rows of the crop to be hoed.

Fig. 105. — Cotton Sweep.

The Cotton Sweep, represented by Fig. 105, is much approved in sections where it has been introduced; the forward or triangular share or sweep works the ground 14 or 18 inches wide; the next teeth are made of

flat bars of iron with the forward edge sharpened, and turned inward at the bottom and level with the share or sweep, in such manner as to cut to the point marked by the sweep, thus making a clean cut of 24 to 32 inches more or less deep, and the small-pointed harrow teeth follow, and more perfectly pulverize the soil and work the weeds to the top; the implement is readily expanded and contracted.

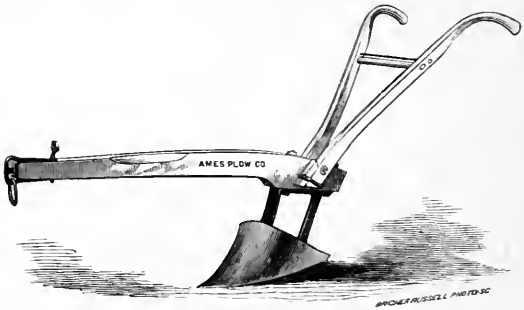

Fig. 106.—Steel-Mould Cotton Sweep.

The Steel-Mould Cotton Sweep, represented by Fig. 106, is much used in the South and West in cultivating various crops; it is made of steel, very light, and adapted to the cultivation in those sections. There are four sizes, from eighteen to twenty-four inches.

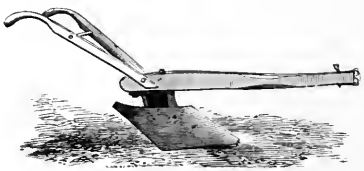

Fig. 107.—Cotton Scraper.

The Cotton Scraper, represented by Fig. 107, is an improved implement, the importance of which every cotton-planter understands and appreciates its advantages for the working of cotton. This implement has been introduced to a large number of planters who have expressed their satisfaction. It is made either of wrought or cast iron.

HAYING AND HARVESTING MACHINES.

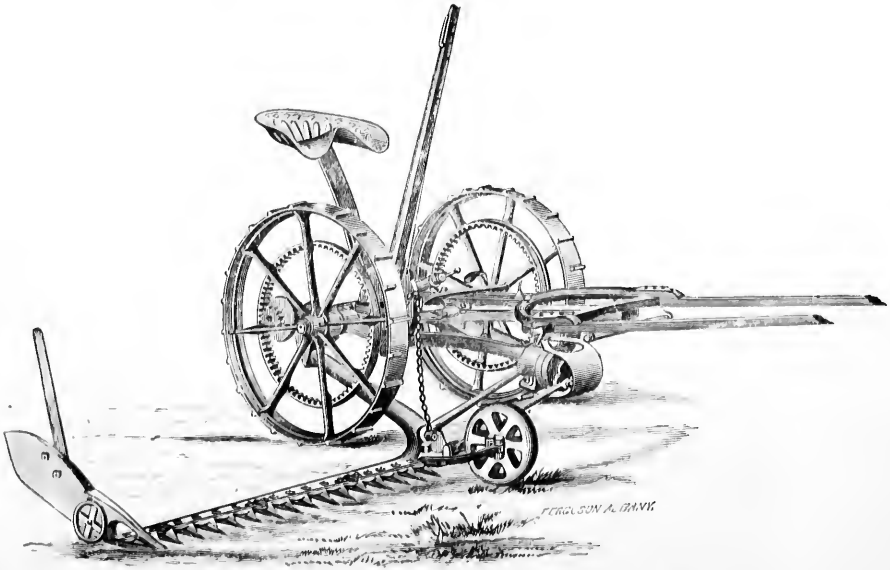

Fig. 109. — Wm. Anson Wood's Improved Eagle Mower.

HAYING AND HARVESTING MACHINES.

In no branch of agriculture has the advance in labor-saving machinery been so marked as in the application of power for the harvesting of the grain and hay crop. Every advance during the last quarter of a century has been in the line of a reduction of the cost in the preparation and ingathering of these crops, which form the true basis of national prosperity.

The introduction of the MOWER gave such a facility in cutting grass in large quantities, that the demand naturally arose for some implement by which it could be rapidly cured. To meet the demand, the TEDDER was invented, than which no implement was more gladly welcomed by the farmer, as it gave him the facility in curing by which he was enabled to keep pace with his increased facility in cutting grass, thus supplementing the gain acquired by the latter.

The remaining requirement, a substitute for *hand-raking*, was met by the HORSE HAY RAKE *on wheels*, by means of which the completion of the hitherto laborious task is accomplished; and the crop secure and ready for removal from the field, — thanks to the MOWER, TEDDER, and HORSE-RAKE, — awaits its disposal either for market or home use.

Wm. Anson Wood's Improved Eagle Mower, represented by Fig. 109, combines all the latest improvements; by its use the farmer is enabled to harvest his grass under all conditions of surface and crop, without the necessity of stoppages to remove tangled grass from the knives, or to repair broken or defective parts. The practical efficiency of this machine has been attained only after years of labor expended in inventing and perfecting the details.

We name some of the principal points of excellence: —

Simplicity. Its great simplicity of construction has done much to give it prominence and to establish its reputation in this respect. It has but few bolts and pieces, and no useless parts to get out of order.

Durability. The frame is of iron, shaped so as to give great symmetry, and a strength that will stand any test. The gearing is in the wheels. The boxes are of iron, cast in the frame.

Draught. The machine is perfectly balanced by the weight of the driver, and the main shoe is hinged at a point below and behind the axle, thus relieving the cutter bar and shoe from all friction, and rendering the draught *imperceptible*. This arrangement adapts the finger bar to the variation in the surface of the ground.

Fig. 110.—The American Hay Tedder.

THE AMERICAN

HAY TEDDER.

The American Hay Tedder is represented by Fig. 110. The introduction of this new and important invention marks a new era in the operation of hay-making, effecting, as it does, such an immense saving of time and labor, and at a season when they are of such value, as to establish itself at once as one of the most valuable and effective labor-saving machines ever offered to agriculturists. The real practical value of the machine cannot be fully appreciated except by those who have seen its operation; but its perfectly simple and mechanical arrangement renders it apparent, at first sight, that it must prove an effective machine for turning or tedding hay, and well worthy the attention of all interested in hay-making.

Grass, when cut by the Mowing Machine, is evenly distributed over the surface of the ground; a non-conducting layer exposed to the scorching rays of the sun on the upper side, but liable to remain wet underneath until evening. The labor of turning this properly is even greater than shaking out the swaths when grass has been cut with a scythe; and again, since the use of the mower has become so general, the farmer is enabled to cut far more grass than formerly, which, in many cases, involves the necessity of hiring additional help to properly take care of it, while in others he hesitates to mow down as large a quantity as he otherwise would, unless he has the adequate means of properly securing his crop without danger from storms.

By the use of the American Hay Tedder all extra help is dispensed with, and he is enabled, in ordinary haying weather, to properly cure all the grass he may see fit to cut, and get it into the barn on the *same day*, thereby not only effecting a great saving in labor, but avoiding all risk from changes of the weather, to which hay is subjected when allowed to remain two or more days after it is mown.

The hay is not only *quickly* dried, but it is done in a most *thorough manner*, for the arrangement and operation of the forks is such as to not merely *turn* the hay, but also to *open* it thoroughly and shake out *every wisp*, without loss by too rough handling, leaving it turned up, its fibres crossed in

every direction, and in the very best condition for the admission of the air and the rays of the sun. Its action is so rapid, and the effect so thorough, that it is fully capable of curing, ready for the barn, any given amount of grass *in less time than twenty* men can do it with hand forks, while the draught upon the horse is very light.

On large farms, the tedder is often put into the field immediately after the grass is mown, and kept in operation until the hay is evenly and perfectly dried, giving the farmer ample time to rake, load and cart it to the barn in the afternoon, and at the close of the day he has the satisfaction of seeing his hay safely stored in the barn, and cured much more perfectly than is possible where the common hand fork is used. The even and perfect manner in which the hay is cured has the effect to *very much improve its quality;* while it is in a better condition for being quickly and easily raked.

The American Hay Tedder is constructed upon entirely new principles. While combining all the features requisite to make a successful tedder, it avoids the many objections that are so apparent in others, and it has peculiarities which render it far superior to anything heretofore in use for the purpose. The machine is mounted on drive wheels, and is furnished with sixteen spring forks, attached to a light reel in a very ingenious manner. The forks are made to revolve very rapidly, and will thus do great execution even while the horse is walking slowly.

It is impossible to clog the machine — it can be backed at all times — runs without noise — and readily passes over any obstruction that a rake will, without damage to it, and without any effort on the part of the driver, who has no levers to operate or treadles to play upon, and has merely to drive his team. In fact no skill or labor is required in operating the machine, and a boy ten years old answers the purpose as well as a man, the operator having nothing to do, under any circumstances, except to sit in his seat and drive the team, having *both* hands free to handle the reins. The movements in operation being rotary, continuous and uniform, the farmer will never complain that it shakes itself to pieces before it is half worn out; while it runs so very light in all its parts the wear is very slight, and the machine will last for years.

The light draught of the American Hay Tedder is one very important feature, and being composed of but few pieces, and those not liable to get out of order, it may be worked for whole seasons without requiring repairs. The admirable manner in which the work is performed, together with the novelty, simplicity, and ease of draught, clearly demonstrates the perfection of the American Hay Tedder, and that it is the only *reliable* machine for the purpose ever invented. It has been thoroughly tested, and a very large number have been sold since its first introduction, and are now in use in different parts of the hay-producing sections of the country, and every farmer and mechanic who has seen these machines in the field will

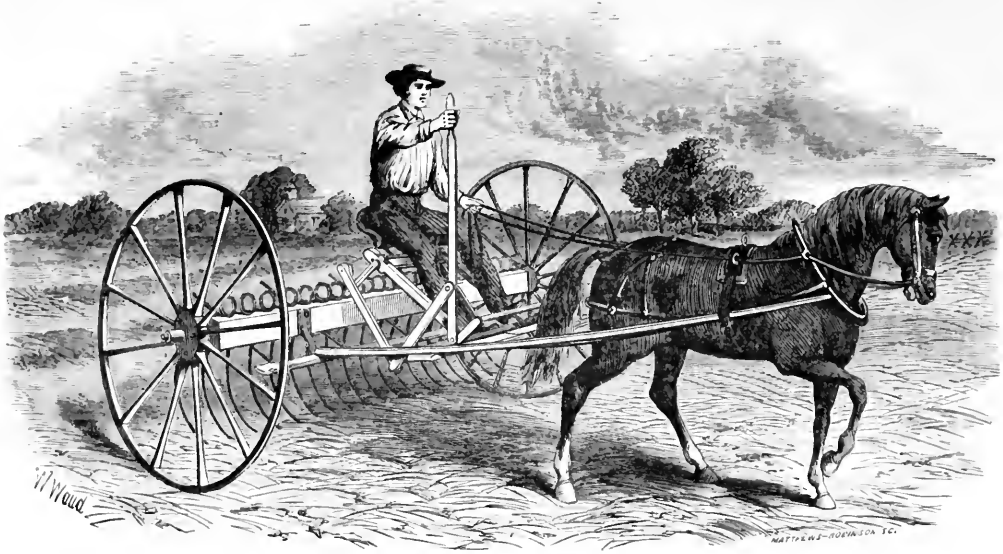

Fig. 111.—Burt's Self-adjusting Horse Hay Rake.

testify to their successful operation in any place where the mower and the horse-rake can be used to advantage.

The machines sold and put in operation have been so perfect, and given such entire satisfaction, that we do not find it necessary to make any alterations. As heretofore, they will be made and finished in the best manner and of the best materials that can be obtained, every part warranted sound and perfect. We continue making them with the attachment for raising and lowering the reel, having learned, by experience, that the forks in action should be higher from the ground in heavy grass than when the crop is light. They are furnished with shafts for one horse, or with pole for two horses, as may best suit the convenience of purchasers.

Burt's Self-Adjusting Horse Hay Rake, represented by Fig. 111, is recommended to all who wish to avail themselves of the best machinery for saving time and labor in making and securing hay. It has great and decided advantages over any machine for the same purpose now in use, and upon trial will be found to do its work cleaner and better, quicker and with less labor to the operator, than any other rake in the market.

These advantages are obtained by a combination of mechanical principles, *which causes the draught of the horse to hold the rake to its place*, just in proportion to the accumulation of the hay in front of the teeth, without any effort or attention on the part of the driver. By this arrangement a proper downward pressure upon the teeth, just sufficient to rake the hay without scratching the ground, is always maintained, and the driver is relieved from the severe labor of maintaining a constantly changing pressure of the foot or hand upon a lever, in order to keep the rake to its work on the surface of the ground. This peculiarity of construction, by which the labor of raking is taken from the operator, and placed upon the horse, enables a boy to manage the machine with the greatest ease, and although the weight of the driver is made available for giving tension to the teeth, and also for discharging the hay, the arrangement is such, that it can be instantly adapted to the weights of different operators, so as to work equally well with a light or heavy person upon the driver's seat.

The simplicity of its parts, the ease with which it is operated, and the facility with which its use is learned, even by those unskilled in the management of farm machinery, seems to commend it to the favor of all. In addition to its great utility in the hay field, this rake has been found admirably adapted for gleaning grain, as the teeth may be elevated any distance from the ground, and kept in the required position; they are also particularly well suited for raking rowen or second crop.

These rakes are made from selected material, and put together in the most workmanlike manner, with a special view to durability. They are *well made and handsomely finished*, and are placed at such a price as to compare favorably in that respect with any first-class horse-rake in the market.

Fig. 112.—Revolving Horse Hay Rake.

The Revolving Horse Rake, represented by Fig. 112, possesses the great advantage of unloading without lifting the rake or stopping the horse. It has a double row of teeth, pointing each way, which are brought alternately into use as the rake makes a semi-revolution at each forming windrow, in its onward progress. They are kept flat upon the ground by the pressure of the square frame on their points beneath the handles; but as soon as a load of hay is collected the handles are slightly raised, throwing this frame backwards, off the points and raising them enough for the forward row to catch the earth. The continued motion of the horse causes the teeth to rise and revolve, throwing the backward teeth foremost over the windrow. In this way each set of teeth is alternately brought into operation.

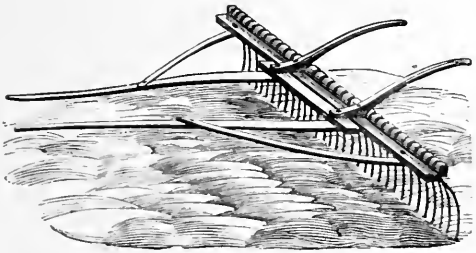

Fig. 113.—Spring-Tooth Horse Hay Rake.

The Wire Spring-Tooth Horse Rake, represented by Fig. 113, is very desirable for use on new, rough grounds, where it has some advantages over those with wooden teeth. The teeth are made of stiff, elastic wire, on the points of which the rake runs; they bend in passing an obstruction, and spring back into their place again. The rake is unloaded by simply lifting by the lower handles, the upper ones being intended for holding and guiding; the rake is light, and about one-half the weight sustained by the horse.

CORN SHELLERS.

CORN SHELLERS.

With the immense corn crop annually raised in this country, it is a question of first importance to have proper machinery for expeditiously preparing the product for market.

To effect the saving of labor, by which the cost is materially reduced, corn shellers of different forms and capacity have been invented.

The following kinds of hand and power shellers embrace the most popular and approved varieties, adapted for the growers of either large or small quantities.

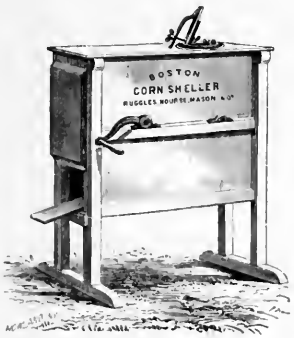

Fig. 114. — Boston and Yankee Corn Shellers.

The Boston and Yankee Corn Shellers are both represented by Fig. 114, the only difference being in size; the former is the smaller size, adapted to the small corn of the New England States; while the latter is larger and adapted to the large corn of the Northern and Western States.

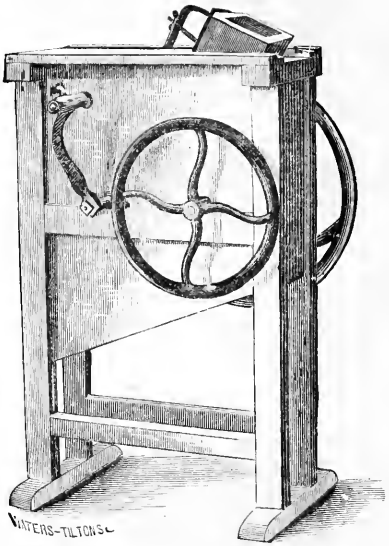

Fig. 115. — Clinton Corn Sheller.

The Clinton Corn Sheller, represented by Fig. 115, is used for shelling the small and medium-sized varieties of Indian corn. It is made with either one or two balance wheels. By the use of two wheels it runs more steadily and with greater ease to the workman. From ten to fifteen bushels of shelled corn per hour is its usual capacity, when operated by a man with a boy to put in the ears.

Fig. 116.—Southern Corn Sheller.

The Southern Corn Sheller, represented by Fig. 116, is made expressly for the large farms and plantations of the West and South, where the corn is larger in the ear than in the Eastern and Middle States.

Fig. 117.—Southern Corn Sheller (with pulley).

The Southern Corn Sheller is represented by Fig. 117, with a pulley and extra balance wheel on the outside to be operated by hand or horse power. It is made both single and double.

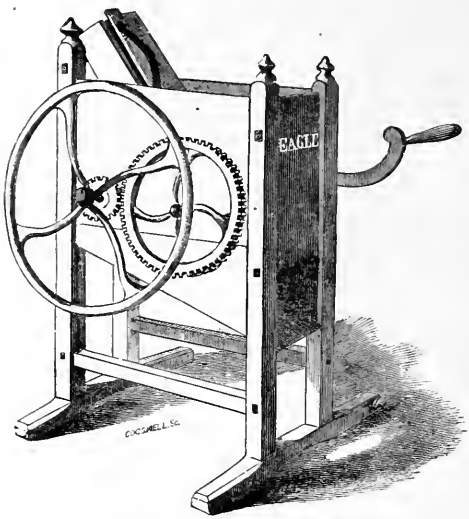

Fig. 118.—Eagle Corn Sheller.

The Eagle Corn Sheller, represented by Fig. 118, is made in same style as the Clinton, but with heavier frame and irons, and finished in a superior manner. It is made with single or double hopper, the former to be worked by hand, and the latter by hand or horse power; the extra weight adds much to its durability and the ease of operating it.

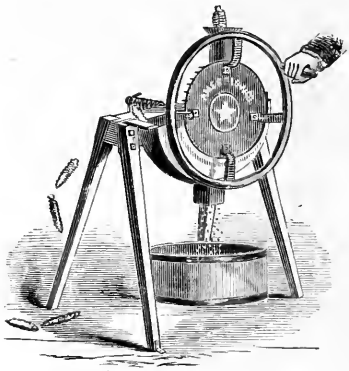

Fig. 119.—Prairie Corn Sheller.

The Prairie Corn Sheller, represented by Fig. 119, is a model of compactness and simplicity; it has the merit of cheapness combined with

durability, and is thus within the reach of every farmer; and it is economy for even the smallest raiser of corn to use it. It is adapted to all sections, shelling equally well the smallest Northern and the largest Western and Southern corn.

Its capacity is nearly equal to the larger and more expensive hand shellers, performing its work rapidly, shelling perfectly clean, and separating the corn from the cob. The corn is prevented from scattering, and is conducted into a receptacle under the machine, the cob passing over the frame to the left of the hopper. A spiral steel spring, regulated by two thumb screws, is around the shaft or projection of the disk or face of the plate, which gives the disk a yielding capacity, sufficient to shell ears of any size.

The tension or strain on the spring is regulated by means of the thumb screws, and when the proper tension is secured for the particular sized ears to be shelled, so that the ears are not broken, the thumb screws are locked, and the tension remains unchanged. Within the hopper is a piece of casting, also secured by a thumb screw, which can be removed when large ears are to be shelled, giving more room for them to descend in the hopper.

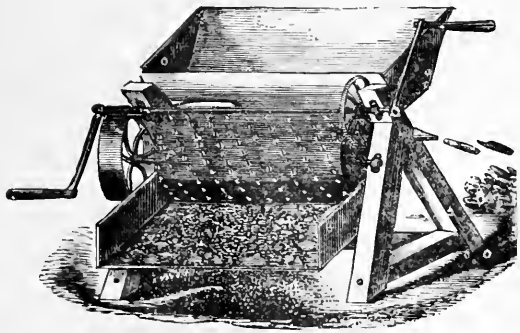

Fig. 120.— Virginia Corn Sheller.

The Virginia Corn Sheller, represented by Fig. 120, has been in use many years in the Southern States and foreign countries; it may be worked by one or two men, or by power, shelling by hand about three hundred bushels per day, and by power about six hundred.

HAY, FEED AND VEGETABLE

CUTTERS.

HAY, FEED AND VEGETABLE CUTTERS.

So great is the utility of cut food for stock, that machines for this purpose are now in general use. The advantages are that a less amount of hay will sustain an animal; that there is less waste of material; that it is better than in a crude state, particularly for animals of labor, as it is sooner eaten, giving more time for rest.

The following are the most approved kinds: —

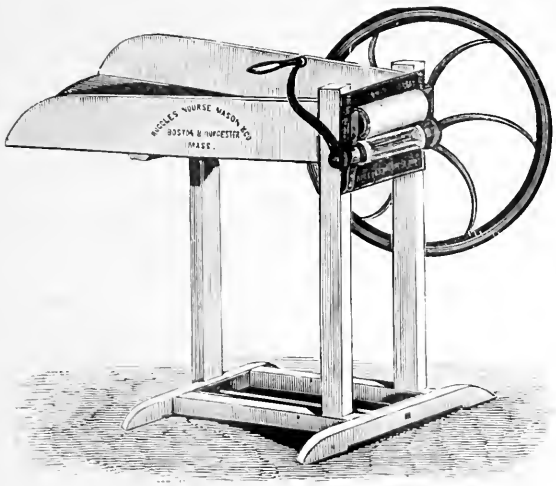

Fig. 121. — Hide Roller Hay Cutter (straight knives).

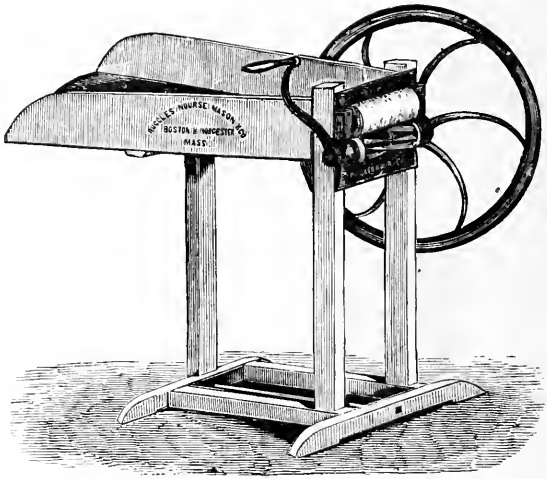

Fig. 122.— Hide Roller Hay Cutter (spiral knives).

The Hide Roller Hay Cutter is represented by Figs. 121 and 122 as made with either straight or spiral knives, which are set in the circumference of a cylinder or arbor and cut against a hide roller. This cutter has been in use for many years, and has given general satisfaction. There are various sizes, the largest to be run with power. Any part can be replaced when worn out.

These machines can be taken apart and boxed for shipment, and readily put together.

Fig. 123.—Green Mountain Feed Cutter.

The Green Mountain Feed Cutter, represented by Fig. 123. is constructed on the direct lever principle; the guard of the knife striking, in cutting, a steel spring, by which the action of the knife is regulated. the hay is readily pushed forward with the hand and the length of cut controlled. This is a very popular cutter, of light weight and easily handled.

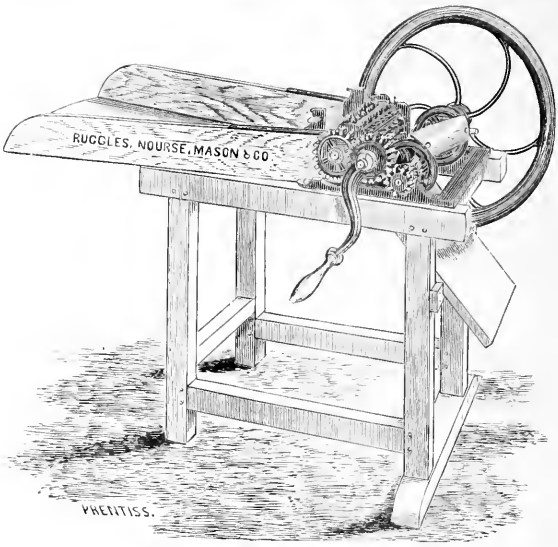

Fig. 124.—Cylindrical Cutter.

The Cylindrical Straw and Stalk Cutter, represented by Fig. 124, is a new machine for cutting coarse forage, is very strongly made, the smaller sizes being operated by one man and the larger by horse-power.

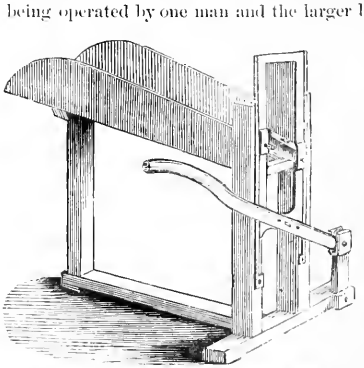

Fig. 125.—Iron Gate Hay Cutter.

The Iron Gate Hay Cutter, represented by Fig. 125, operates by a lever; the knife and plate in which it is secured run in grooves holding them firmly, so that a steady, clean cut is made of the hay or feed.

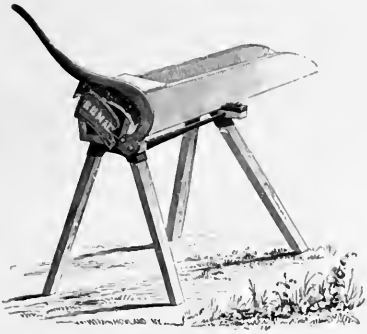

Fig. 126.—Patent Lever Hay Cutter.

The Patent Lever Hay Cutter, represented by Fig. 126, is strong and effectual, well calculated for the Southern States, and adapted to cutting corn-stalks. It is less liable to be injured by inexperienced hands and exposure to the weather than most machines. The parts are easily separated and packed for transportation, and readily put together again.

VEGETABLE CUTTERS.

There is a great advantage in feeding cattle and sheep during the winter months partly on vegetables, if properly cut, so as to prevent choking, and to make them easy of digestion. The vegetables, after passing through the cutter, may be mixed with straw, coarse hay, or other cheap forage, which one would like to dispose of economically, and the mixture, after lying a little time, so that the forage may become impregnated with the juices and scent of the sliced roots, will be greedily and wholly consumed by the stock.

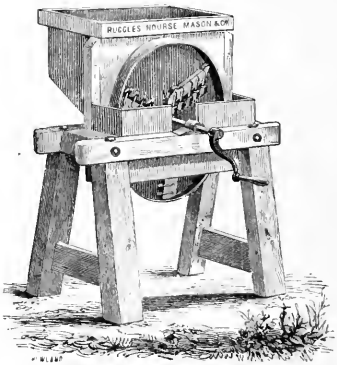

Fig. 127.—N. M. & Co. Vegetable Cutter.

The N. M. & Co. Vegetable Cutter, represented by Fig. 127, has the cutting wheel made of cast iron, through which are inserted three knives similar to plane irons; these cut the vegetables into thin slices with great rapidity, and the cross knives operate to cut and break them into irregular pieces, of convenient form and size for cattle or sheep to eat without danger of choking. The machine is made in a permanent and durable manner.

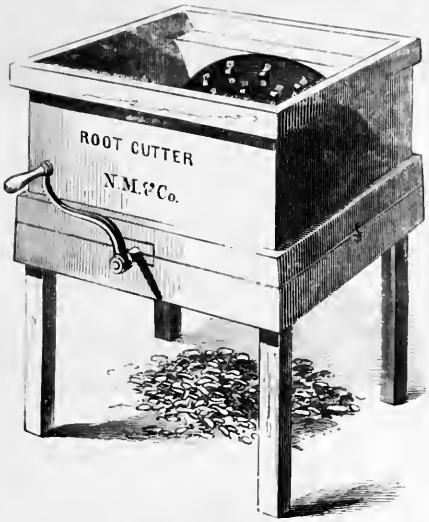

Fig. 128.— Willard's Vegetable Cutter.

Willard's Patent Root Cutter, represented by Fig. 128, cuts vegetables very rapidly and in thin slices, fine enough for sheep, lambs and calves. It is very easily operated, so that a boy can turn the crank without much exertion. The arrangement inside is such as to prevent all liability of clogging the cutter while at work, and the knives are easily repaired. Pumpkins are readily cut with this machine for cooking for swine.

The Ross Improved Root Cutter differs from the N. M. & Co. in the knives having scalloped edges, by which the slices are cut in an irregular form, thus more readily broken in eating, which makes it very desirable for sheep and young stock.

HORSE-POWERS

AND

MILLS.

HORSE-POWERS

AND

MILLS.

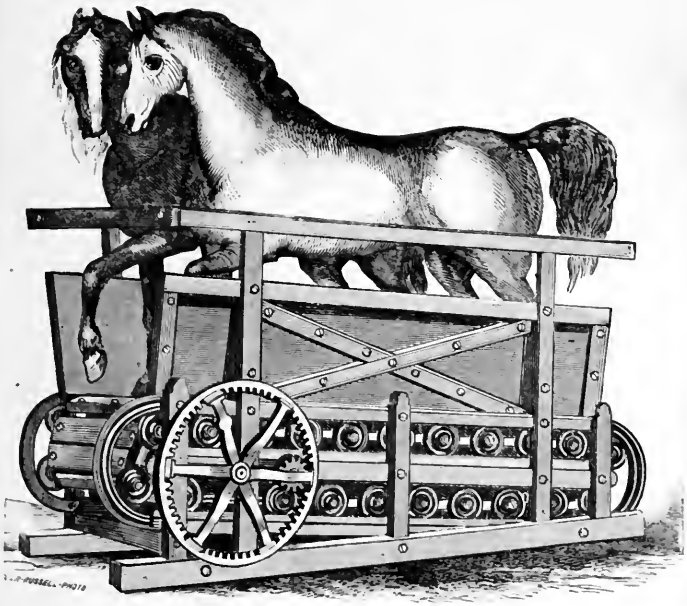

Fig. 129. — Union Horse-Power.

The Union Horse-Power, represented by Fig. 129, has the wood frame-work constructed similar to most of the Tread or Endless Chain Powers in use, but the arrangement of the iron work or running gear is almost entirely new. The links are made with cogs, and the driving gear wheel is placed back from the end, and directly under the horse, and is of

sufficient diameter to cog into the chain links, both at top and bottom of the gear wheel. By this device the propelling power of the horse is always acting directly on the top of the driving gear on the same plane, and consequently there is no loss of power or increase of friction; the returning sections of the chain on the bottom track are acted upon in the same manner as the top portion. The power thus acts directly on the chain to propel it up the incline plane (and not indirectly around the end of the track as with machines constructed with spiders or rolls on the end) thus the connecting pivots of the chain are relieved of all strain and friction usually caused by passing the end track.

By this cogging into both top and bottom a *perfectly smooth* and regular motion is given to the chain, and all the trembling, jerking motion, usually caused by the sections of the chain passing the ends from the top to the bottom track, is entirely avoided, and the difference in the *tension* of the chain passing the ends is so entirely overcome that the powers may be constructed with any desired length of link or section. We are thereby enabled to dispense with half the number of axles and wheels, thus saving a large portion of the expense for repairs, lessening the friction, and reducing the cost of lubricating. By this device we can construct the wheels of large diameter, without making the machine cumbersome. All the connections or pivots, the axles and wearing surfaces, are *chill hardened and very durable;* the gears and band wheel are readily changed from one shaft to the other, and from one side of the machine to the other.

The links and treads are so constructed that the tread holds the link and axle that supports the horse, and dispenses with the supporting rods or axles extending across the chain as commonly used in horse-powers; thus avoiding the useless heavy weight of cross rods and the liability of their getting bent by the horse stepping on them when the treads become worn. The treads are so simple in construction that any one of common ingenuity can make them without the aid of machinery, and they can be removed and replaced without disturbing any part of the machine; it has been thoroughly tested and found to be durable, giving a large per cent. of power, and will run at a slight elevation. The following advantages over other horse-powers give these satisfactory results: —

1st. The wheels are larger in diameter and less in number than is usually employed in horse-powers.

2d. The platform chain moves with a perfectly smooth and free motion.

3d. All the pivots, boxes, and axles are hardened and smooth, thus causing less friction.

4th. The power is applied at the top and bottom of driving gear; by this means *the weight and power of the horse acts directly to propel* the machine with great force.

5th. There is no strain on the chain in passing the end tracks.

It is made for both one and two horses.

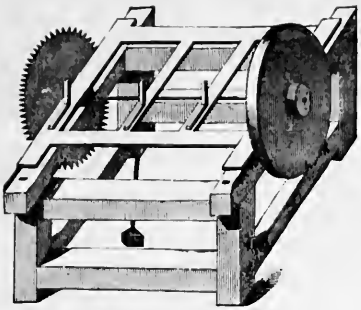

Fig. 130.—Saw Mill.

The Saw Mill, represented by Fig. 130, is made strong with joint bolts, patent metallic boxes, and large, long shaft. It has a heavy fly-wheel, and may be run with single or double horse-power; a twenty-four-inch circular saw is used. With a one-horse-power ten to fifteen cords of hard wood per day can be cut twice by two men, and as much soft wood as can be handled.

THRESHER AND SEPARATOR.

The Overshot Thresher, with Separator Attachment, represented by Fig. 131, threshes the grain, and simply separates the straw and delivers it ready for stacking from the end of the separator, the grain and fine chaff falling through the openings upon the floor or ground under the same. The grain and chaff is often removed by an attendant to an ordinary fan mill, and cleaned at the same time, the fan mill being driven by hand, or by a band from the horse-power.

The separators are simply large wooden riddles, about three feet wide, and ten feet long, with thin, light wood bottoms, perforated full of holes,

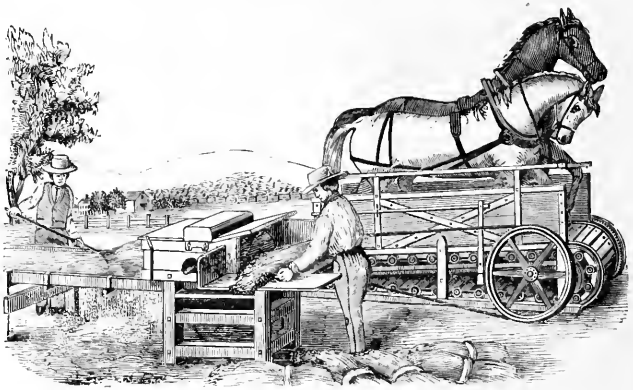

Fig. 131.— Thresher and Separator.

about one inch in diameter, made strong and light. When made for exportation, or very changeable climates, with extremes of heat, moisture, and dryness, perforated and corrugated sheet iron is used for the separator bottoms, in place of light wood, which would soon become rickety and fall to pieces.

They are suspended about two feet from the floor by means of two straps or chains at the corners next the thresher, and to hooks for that purpose in the thresher, as seen in the figure; the other end being upon swing legs,

which stand upon the floor, and connected to them by an iron rod running through them and the end of the separator.

The thresher, for this connection, has a shaft with a crank on it attached crosswise, and under the feeder's table; the shaft extending outside, and receiving a pulley which engages the horse-power band precisely as in the case of the fan shaft and pulley. From this crank a pitman extends midway under the thresher to the under side of the separator, by which it is agitated, and does its work better than three or four men could do it by hand. This crank and pulley is changeable to either side, to operate right or left handed.

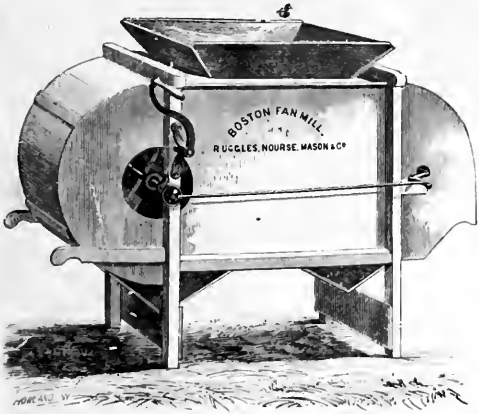

Fig. 132.—Boston Fan Mill.

The Boston Fan Mill, represented by Fig. 132, is cheap, light and portable, but strong and durable; it works with efficiency, cleaning grain and small seeds, with much despatch, at a single operation. The small sizes are more particularly adapted to the wants of the farmers in the New England States. Six sizes are made. They can be taken apart, and boxed for shipment.

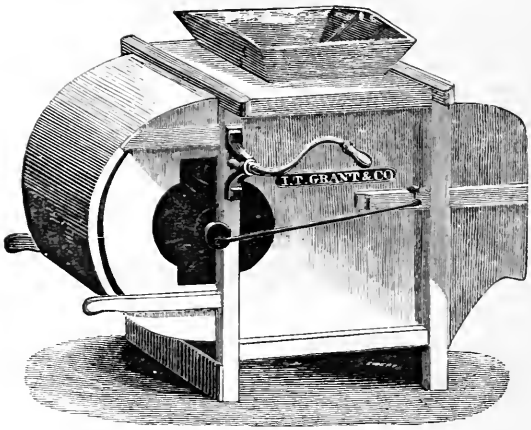

Fig. 133.—Grant's Fan Mill.

The Grant Fan Mill, represented by Fig. 133, is believed to be the most effective for perfectly cleaning every kind of grain, rice, grass and other seeds at one operation. It is made in the most substantial manner, of the best material; seven sieves accompany each mill, with printed directions for placing them, and the slides for the cleaning of the different seeds. Six sizes are made.

These and the other fan mills are constructed so that they may be taken apart for transportation. As joint bolts and screws are used, they may be set up without difficulty or fear of want of adjustment.

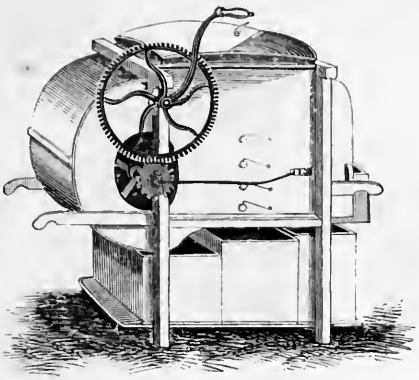

Fig. 134.— Yankee Fan Mill.

The Yankee Fan Mill, represented by Fig. 134, is a very convenient small mill for use in the store, as it is designed for cleaning coffee, spices, rice and grass seeds, having a variety of sieves, slides and boxes adapted to these various articles.

It is so adjusted that in operating, more or less wind can be let on the sieves, thus regulating the force to the particular article to be winnowed. It occupies very little space, is light and portable, and a perfect fan mill for the purpose intended.

The Improved Worcester Fan Mill is of similar construction to the Boston, except that the frame for the sieves to rest on is wider, and the slides are attached to the sides of the mill, which are divided so that a portion moves, thus giving a greater surface, and consequently larger capacity, for the same size.

The Horizontal Fan Mill is an old style; the round house, or wind box, is placed on the side, and the fans revolve on an upright shaft, the sieves moving in a long, narrow box, forward and back, instead of from side to side, as in the recent patterns.

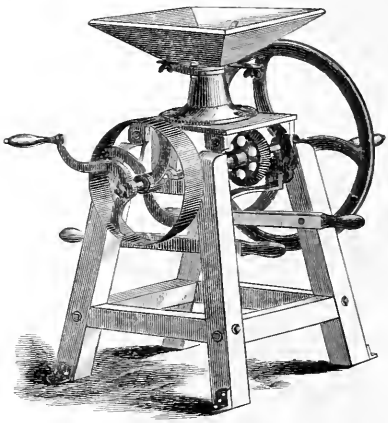

Fig. 135.— Horse and Hand Grain Mill.

The Hand and Horse Grain Mill, represented by Fig. 135, is made of iron, and can be run either by hand or horse power; by the latter it will grind four bushels of grain fine per hour, and a greater quantity if coarse.

It is of simple construction, very efficient and durable, not liable to need repairs. When the plates or grinding surfaces are worn, they can be replaced at a small cost.

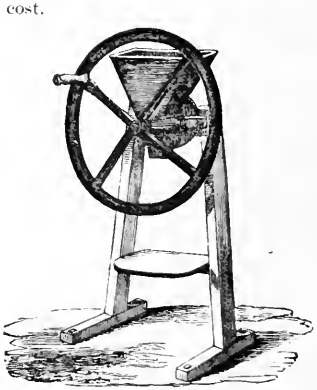

Fig. 136.— Hand Grain Mill.

The Hand Grain Mill, represented by Fig. 136, is used for grinding grain, or coffee and spices if desired; its capacity is from one to two bushels per hour.

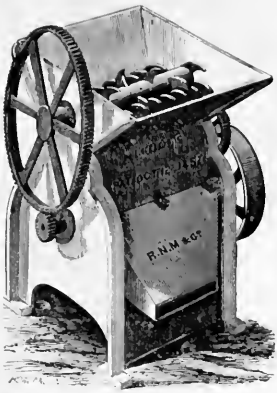

Fig. 137. — Nichols' Corn and Cob Crusher.

Nichols' Corn and Cob Crusher and Pulverizer, represented by Fig. 137, has been in extensive use for many years, and, for a rapid, easy and perfect crusher, it is unequalled.

It will crush double the amount of any machine before it requires repairs — it will crush four times as fine as any other crusher — it is operated with one-third less power than any other mill.

This machine can be run with horse, steam or water power, and to accomplish its full work the cylinder should perform six hundred revolutions per minute; it is regulated to grind coarse or fine by a set screw over the front concave. Patent dated Oct. 12, 1852.

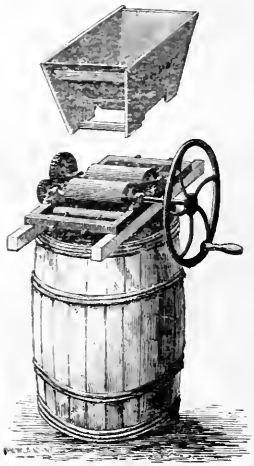

Fig. 138. — Barrel Sugar Mill.

The Barrel Sugar Mill, represented by Fig. 138, is intended to be placed over a barrel, saving the room occupied by the Box Mill. It answers the same purpose, the capacity being less.

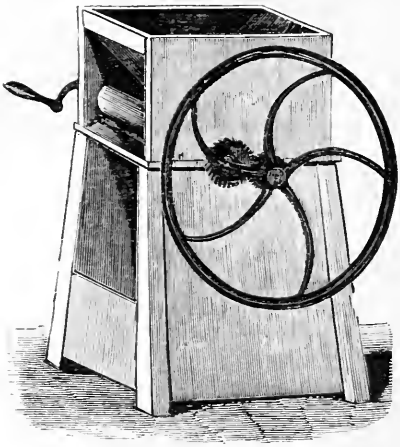

Fig. 139. — Box Sugar Mill.

The Box Sugar Mill, represented by Fig. 139, is used by grocers for crushing sugar as it is taken from the hogshead. The dampness of the

bottom and sides is thus equalized, and the appearance of the sugar thereby improved. It is simple, and easily kept in order, and will crush from six to twelve hogsheads per day.

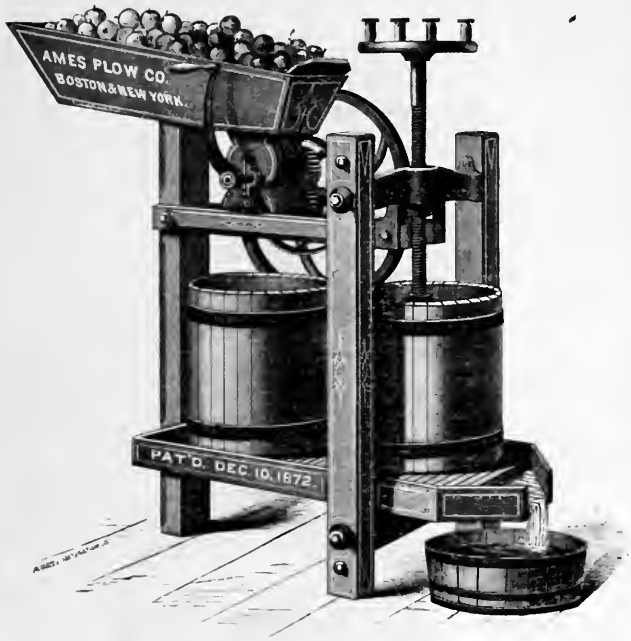

Fig. 140.—National Farmer's Cider Mill.

The National Farmer's Cider and Wine Mill, represented by Fig. 140, is constructed upon new principles out from the beaten track of previous inventions, avoiding the defects existing in all other mills, for the purpose, now before the public. No other mill so completely breaks down the structure of the apple, and so well prepares its pomace for producing the largest possible percentage of cider. The peculiar construction and arrangement of the rollers in this are such that the best qualities of both crushing and grating mills are combined.

The grinding arrangement is very simple, consisting of two rollers, arranged to work together in such manner that the cells of the fruit are broken, a very fine pomace produced, and by this, under the pressure of

the screw, a larger percentage of juice is obtained, making more cider from a given quantity of apples than can be made with any other mill. This feature should not be overlooked by those intending to purchase, as the increase in product by the use of this mill will soon pay its cost.

It is very strong and durable, and requires but little power to operate it. It is provided with a convenient hopper, and is so arranged that the feeding is done easily and without any waste of time. By means of a simple arrangement, the grinding parts can readily be adjusted for coarse and fine work, adapting the mill to various purposes. The superior form and combination of the different parts enables the operator to do more work with this mill, with less labor, and with a greater saving in results, than with any other mill.

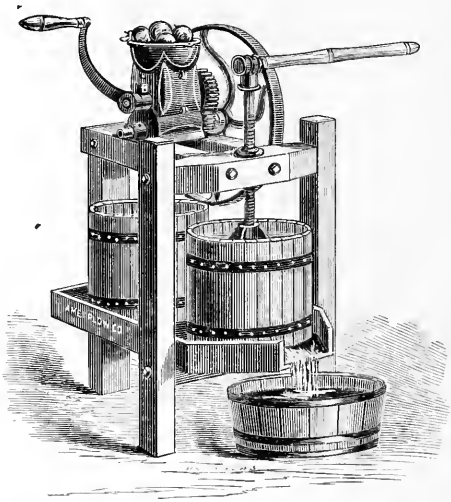

Fig. 141. — National Family Cider Mill.

The National Family Cider Mill, represented by Fig. 141, is the same in principle and operation as the Farmer's, but of smaller size, adapted to family use. It is light, strong, and convenient, easily operated, and sold at a price that brings it within the means of any one wishing to make cider and wine for family use.

The frame-work is strong and compact. There are two curbs, by the use of which is obviated the necessity of handling the pomace after crushing the fruit, or of stopping to press the pomace, as is the case with other mills of this class having only one curb. The work is thoroughly and

effectively performed. The use of two curbs allows the operation of grinding and pressing both at the same time, thus greatly facilitating the work, increasing the capacity of the mill, and giving more time for the juice to drain from the pomace.

Fig. 142.— Lard, Cider and Wine Press.

The Lard, Cider and Wine Press, represented by Fig. 142, is made in six sizes, light and portable, yet strong and well adapted for family use.

CHURNS.

CHURNS.

The Davis Self-adjusting Churn and Butter-Worker, represented by Fig. 143, possesses the *best qualities* for the successful making of butter. It is furnished with a dash made with movable floats, thus securing the thorough agitation of the entire mass of cream, and after the butter comes, the reverse motion of the dash closes the floats thus expressing the buttermilk; by the same motion the salt is thoroughly and evenly worked in.

Starting with simply cream in the churn, we have the result — butter perfectly prepared, ready for shaping for the table or packing for market —

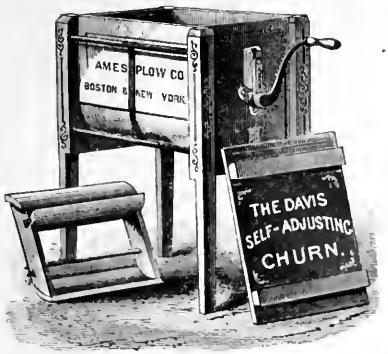

Fig. 143. — The Davis Self-Adjusting Churn.

fully establishing the claim for "The Davis" not only as a self-adjusting churn, but a butter-worker.

We make five sizes, the capacity varying from two to eighteen gallons of cream: packed for shipment in racks of two.

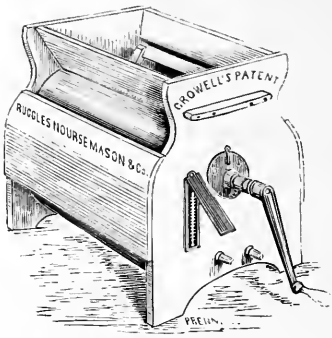

Fig. 144.—Thermometer Churn.

The Thermometer Churn, represented by Fig. 144, the result of a series of careful scientific experiments, is offered confidently to butter-makers. In churning, the milk or cream should be of a suitable temperature, for if warm or cold water is added to produce the desired temperature the butter is then invariably poor in quality and limited in quantity.

To arrive at the exact necessary temperature was, however, always very difficult, and in fact never practically accomplished until now. One advantage of this churn consists in having a thermometer placed in one end, entirely secure from breakage or accident, and always visible, so that the operator may know with certainty when the milk or cream is brought to the proper temperature. The thermometer is marked at 62 degrees, the temperature necessary to produce the most perfect separation.

Another advantage consists in its having a place in which to readily produce the requisite temperature by hot or cold water, without the water being mixed with the milk or cream. For this purpose the inner part of the churn, or that in which the milk or cream is placed, is made of strong sheet zinc, of a semi-circular form. A short distance outside of this is another sheet of zinc, also of a semi-circular form, and attached to or backed up by the body of the churn so as to leave an intervening chamber surrounding that in which the milk or cream is placed, and into which cold or warm water may be introduced as required to increase or diminish the temperature. If the milk or cream is too warm, the mercury will rise above 62°, and cold water should be placed in the chamber; if too cold, the mercury will fall below the mark, and warm water must be used. The milk or cream should be agitated by turning the crank while the water is being introduced, to give an even temperature throughout.

In regulating the temperature, the water may, when desired, be easily removed by taking out the plug. When the thermometer indicates that the milk or cream is of the proper temperature, the churning may be performed by giving the crank about forty revolutions per minute. The double zinc bottom, and other durable properties of this churn, remove all liability to warp or shrink, and adapt it to use in all countries, especially those with a hot or dry climate. It is light, simple, easy to operate, and readily cleaned. It is made in eight sizes, from 2½ to 28 gallons. Packed in racks for shipment.

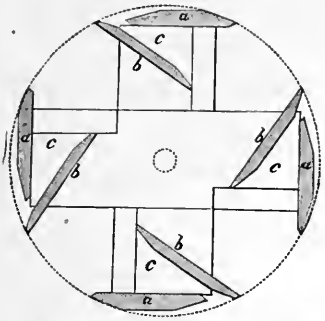

Fig. 145.—Robbins' Patent Churn Dash.

The Robbins Patent Centripetal and Centrifugal Dash, represented by Fig. 145, is furnished with the thermometer churn when desired. This dash consists of four sets of floats, of two each, and each set placed at right angles with the other. One float in each set is placed at a short distance from the other one, and each innermost one has its near edge so near the edge of the next, and its front edge so distant, as to leave an angle of about twenty degrees between them, and so located as to sit diagonally with the line of motion. By forcing the milk or cream through an angular opening between the floats, much more available churning friction is obtained by this dash than by others, and very little more power is required to work it.

The same line of motion is continued until the butter forms, or separation takes place, after which a reverse action must be given. The reverse action changes the relation of the inner floats, and collects the butter to the centre of the churn in a solid roll. The dash is held in high estimation by those who have used it.

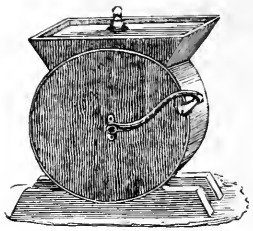

Fig. 146.—Cylinder Churn.

The Cylinder Churn, represented by Fig. 146, is one of the most simple rotary churns, and combines most of the advantages of all other churns of a cylindrical character. It is a light and portable style of churn, and may be placed on a bench or table and operated by a child.

There are two kinds made: blue painted, and varnished, alike in all practical respects, except the varnished are made of a better quality of stock. Both kinds are now made with metallic bearings, and with improved cranks. There are five sizes, from $2\frac{3}{4}$ to 20 gallons. Packed in racks for shipment.

Fig. 147.—Dash Churn.

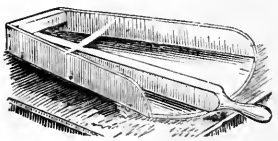

Fig. 148.—Lever Butter Worker.

The Dash Churn, represented by Fig. 147, is the old-fashioned style, still preferred by some. It is made of two kinds of materials, pine and white cedar; the former painted blue, and the latter unpainted.

The Lever Butter-Worker, represented by Fig. 148, should be more generally used in butter-making. Its advantages are, that the butter can be kept cool in working, and the necessity of using the hands avoided; the buttermilk may be more thoroughly worked from the butter, and the salt worked in more evenly. It is easily cleaned, and takes but little room. The lever is round and fluted.

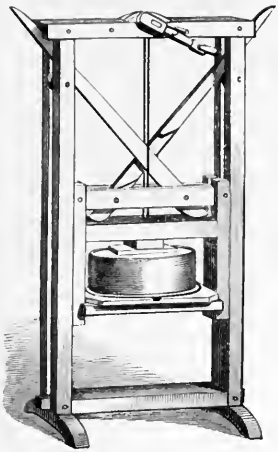

Fig. 149.—Self-Acting Cheese Press.

The Self-Acting Cheese Press, represented by Fig. 149, is light and portable, and a great convenience in the dairy. The cheese is placed in the press, and its own weight presses it by a moderate pressure at first, as it should be, but gradually increases as the inside frame moves down, until the cheese is perfectly pressed. Light or heavy pressure may be applied to cheese of the same weight, by simply raising or lowering the inside frame by sliding blocks between the two followers; indeed, the press may be regulated to any degree of pressure that may be desired. The cheese is not removed until the pressing is completed.

MEAT CUTTERS

AND

SAUSAGE STUFFERS.

MEAT CUTTERS

AND

SAUSAGE STUFFERS.

Perry's Patent Meat Cutters, made entirely of iron, with cutting knives of best cast steel, are simple, compact, very efficient and easily kept in order. The bearings are fitted accurately, and all parts well-finished.

The shell, in two parts, held together by hinges and a clasp, is easily opened, and when closed is secured firmly in position for work. Every part of the machine is instantly accessible; for cleaning, the cylinder only needs to be lifted out after the machine is opened, and the inside of the shell being smooth the whole can be kept sweet and in perfect order with but little trouble to the operator.

The knives are placed in two rows, one row or section each side of the machine, each section of knives being held in position securely by one or two screws, and by removing these, each knife, or the whole section, may be taken out for grinding or to be replaced by new ones whenever occasion may require. All the machines, except the smallest sizes, are furnished with a slide, by moving which it can be regulated to cut coarse or fine.

We manufacture five sizes.

Fig. 150. — Meat Cutter No. 1.

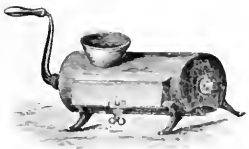

Fig. 151. — Meat Cutter No. 3.

Meat Cutters Nos. 1 and 2, represented by Fig. 150, are the smallest sizes, adapted to family use, cutting the meat in a manner equal to the larger machines, but not as rapidly.

Meat Cutter No. 3, represented by Fig. 151, is intended for hotels.

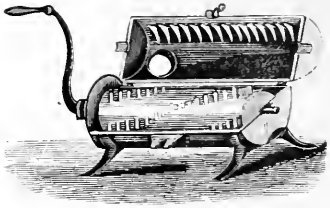

Fig. 152.—Meat Cutter No. 4 (open).

Meat Cutter No. 4, without gearing, represented open and shut by Figs. 152 and 153, for butchers' use; operated by one or two men it will cut one hundred and fifty pounds of meat per hour, fine enough for sausages, and even more, if the knives are kept sharp and in good condition for work.

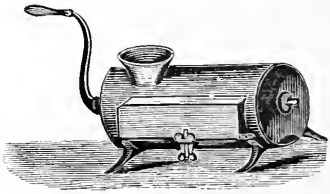

Fig. 153.—Meat Cutter No. 4 (shut).

Meat Cutter No. 4, geared, is easily operated by one man, and, of course, does less work per hour than the other without gear.

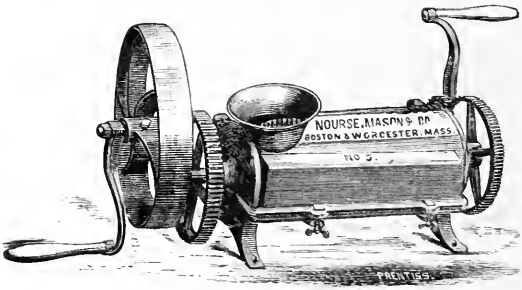

Fig. 154.—Meat Cutter No. 5 (double geared).

Meat Cutter No. 5, represented by Fig. 154, is the largest rotary cutter in the market. This machine is double geared, and furnished with a driving pulley and two cranks, thus making it convenient for operation by hand or power, and capable of cutting five to seven hundred pounds per hour.

Sausage Stuffers. The machines are simple and easily kept in order. The hoppers, made of heavy best quality tin, are strengthened with hoops and bonds to keep them perfect in shape, thus allowing the plunger to pass back and forth smoothly without waste of power by friction, thereby avoiding unnecessary strain upon the hoppers. Six sizes are made: —

Sausage Stuffer No. 0 is light, yet durable and efficient, intended for family use.

Fig. 155.—Sausage Stuffer No. 1.

Sausage Stuffers Nos. 1, 2 and 3, represented by Fig. 155, are suitable for hotels and butchers' use.

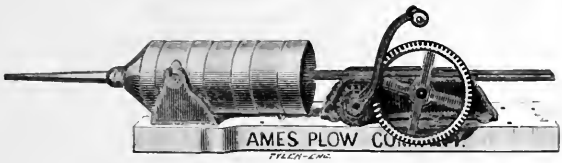

Fig. 156.—Sausage Stuffer No. 4 (geared).

Sausage Stuffer No. 4, represented by Fig. 156, is geared, and does the work rapidly, but is easily operated. One or two tubes, fitting large or small skins, are furnished with all, except the smallest, when required.

CARTS AND WAGONS.

STORE, RAILROAD & BAGGAGE TRUCKS.

WHEELBARROWS.

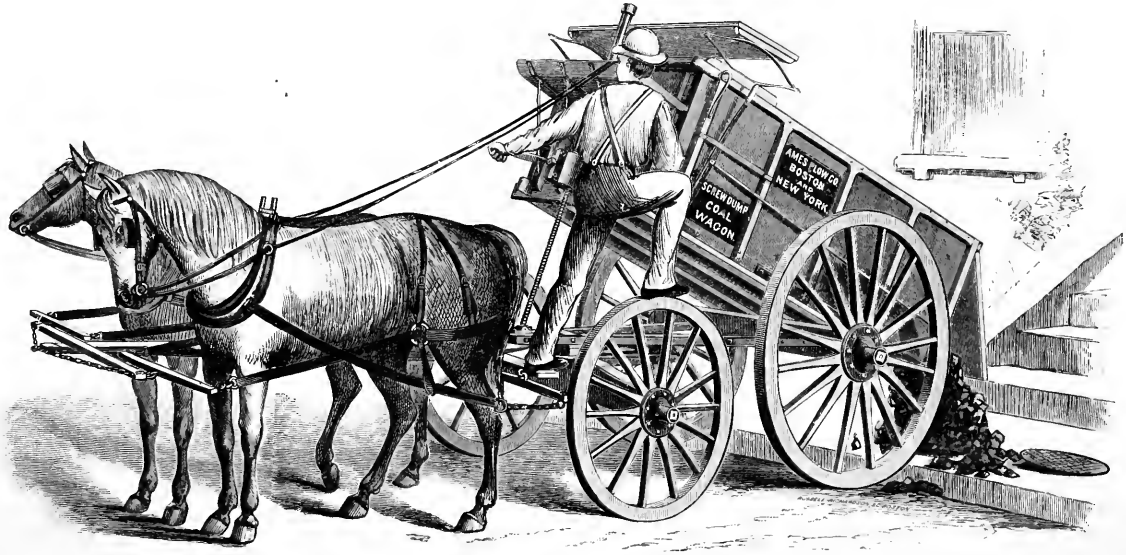

Fig. 157.—Patent Screw Dump Coal Wagon.

CARTS AND WAGONS.
STORE, RAILROAD & BAGGAGE TRUCKS.
WHEELBARROWS.

We give illustration and description of the various carts and wagons we manufacture; we can, however, furnish any particular style ordered, and are prepared to fill such orders at short notice. The materials used are of the best selected quality, and the workmanship is such as to render them durable and of thorough finish.

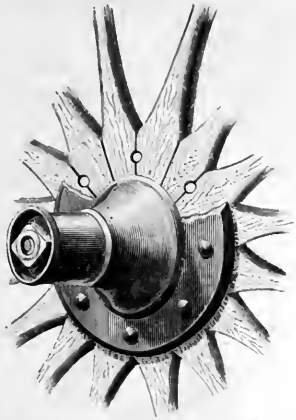

Fig. 158. — The Iron Hub Wheel.

The Iron Hub Wheel is represented by Fig. 158. This gives a perfect showing of the manner in which the spokes are fitted to the Iron Hub, rendering the wheel solid and firm by the bolts fastened through the flanges, which hold the spokes securely in their places, so that it is impossible for them to move or work. Our Wheels are made with this hub.

The Patent Screw Dump Coal Wagon is represented by Fig. 157. The advantage of the use of this screw is clearly shown in the representation. We apply the screw to wagons of the capacity of one to five tons. Many dealers have all their wagons of this kind.

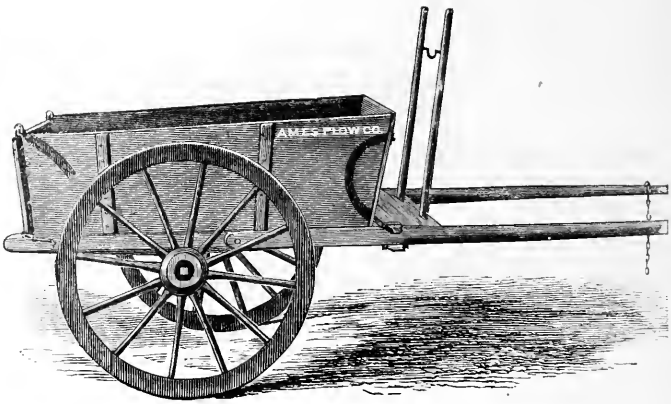

Fig. 159. — Coal Cart.

The Coal Cart, represented by Fig. 159, is the ordinary style for city use; the capacity is increased by making the sides higher.

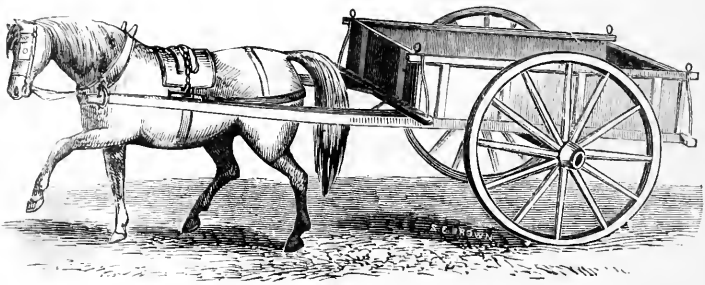

Fig. 160. — Medium Horse Cart.

The Medium Horse Cart, represented by Fig. 160, is the size we keep in stock; we also make Mule Carts, Light Horse Carts, Extra Horse Carts, and Railroad or Contractors' Carts.

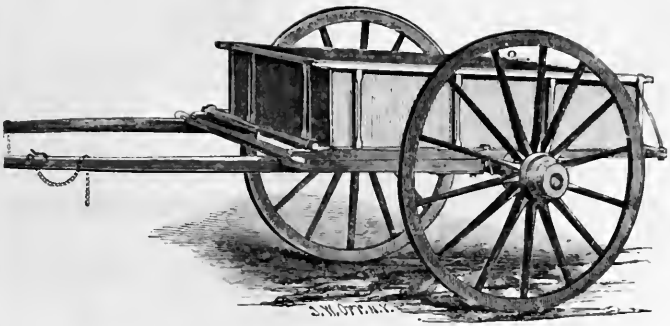

Fig. 161. — Brick Yard or Clay Cart.

Brick Yard or Clay Cart is represented by Fig. 161.

We also make brick carts with bodies to detach from running gear so that they can be placed ready loaded on platform cars.

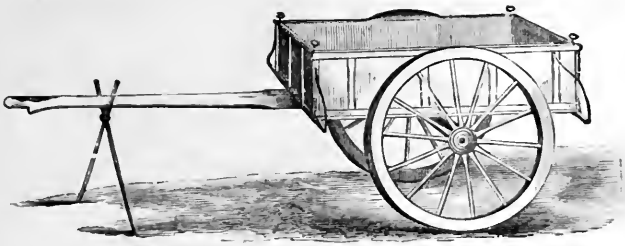

Fig. 162. — Light Ox Cart.

Light Ox Cart is represented by Fig. 162.

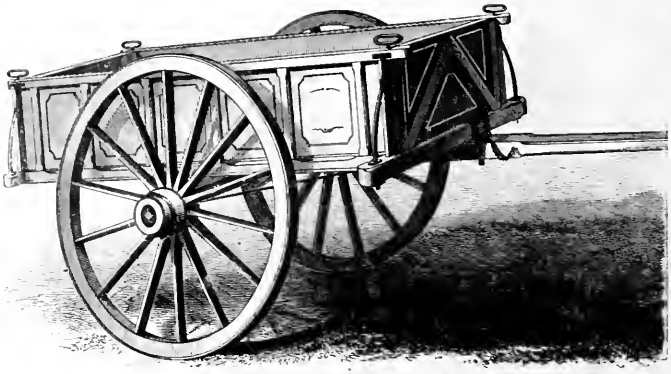

Fig. 163.—Heavy Ox Cart.

Heavy Ox Cart, represented by Fig. 163, is of larger capacity than the preceding, and is made stronger and heavier, intended for any requirement of farm or road work.

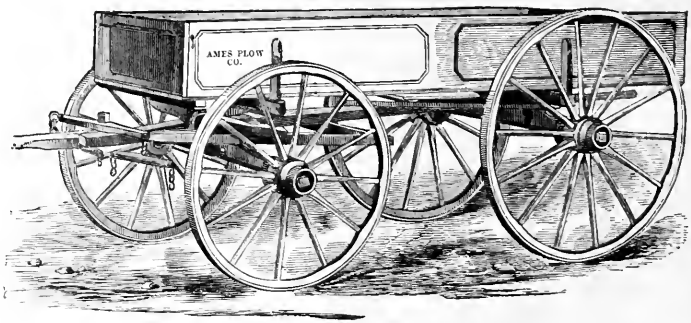

Fig. 164.—Farm or Plantation Wagon.

Farm or Plantation Wagon, represented by Fig. 164, is of the ordinary form for farm use. It can be furnished with light or heavy body to adapt it to the use intended.

The Four-Wheel Farm Cart, represented by Fig. 165, is intended for use on the farm. The advantage of this form is that it prevents the weight of the load pressing upon the back of the horse, and allows the load to be easily dumped. It can be readily fitted to carry hay by the addition of ladders and stakes. It can be used with shafts or poles.

Fig. 165.—Four-Wheel Farm Cart.

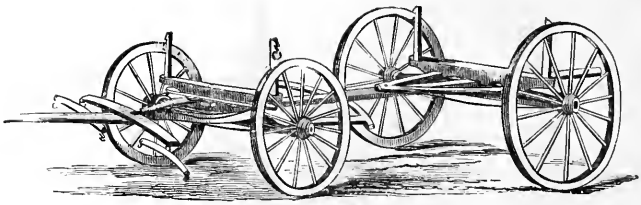

Fig. 166.—Running Gear.

The Running Gear, represented by Fig. 166, is intended for use in transporting lumber; the size and strength can be varied to adapt it to the load to be carried, or a body can be fitted to it making an excellent farm wagon.

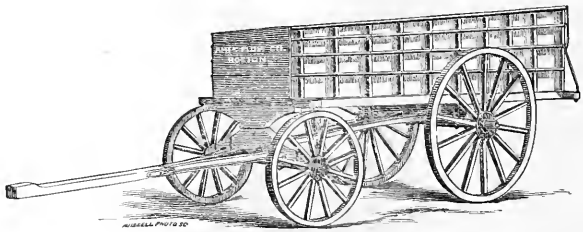

Fig. 167.—Tip Cane Wagon.

The Four-Wheel Tip Cane Wagon, represented by Fig. 167, is used to transport the cane from the field to the mill; it is built strong and can be used either with oxen or mules.

The Cotton or Log Truck, represented by Fig. 168, is well adapted for the purpose indicated. It can be furnished either for light or heavy work.

Fig. 168. — Cotton and Log Truck.

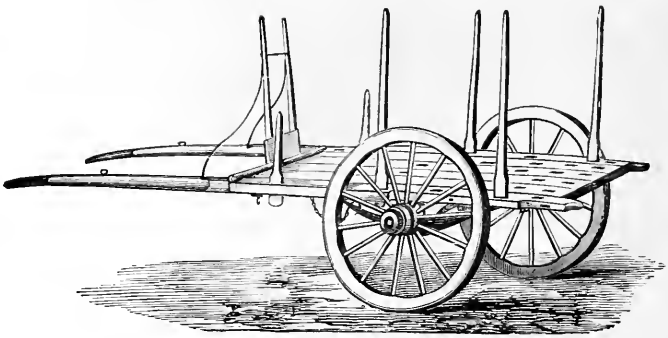

Fig. 169.—Cart for City use.

The Cart for City use, represented by Fig. 169, is intended for transporting merchandise; the mortised holes into which the stakes fit, adapt it for carrying *securely* large or small loads.

Fig. 170. — Hand Cart.

The Hand Cart, represented by Fig. 170, is very useful for light work.

We manufacture three kinds: —

Boston hand cart, iron hubs.
Philadelphia hand cart, wood hubs.
Heavy hand cart, iron hubs.

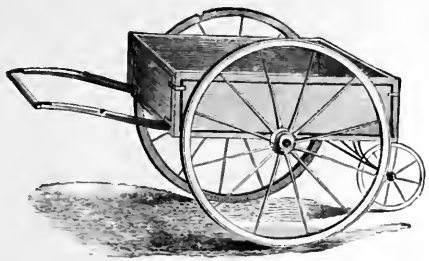

Fig. 171. — Three-Wheel Hand Cart.

Three-Wheel Hand Cart, represented by Fig. 171, is made especially for city use; it is particularly adapted for printers, paper dealers, booksellers, and grocers.

When ordered, we make it with springs.

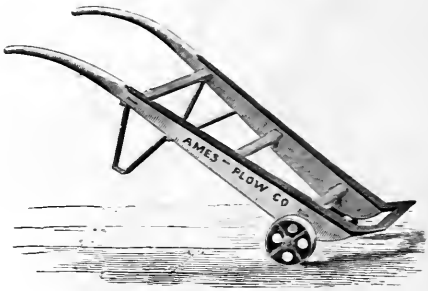

Fig. 172.—Store Truck.

The Store Truck is represented by Fig. 172. the dark lines showing the iron work. These trucks are made of the best materials. Eight sizes are made: the five smallest are furnished either with wheels inside or outside.

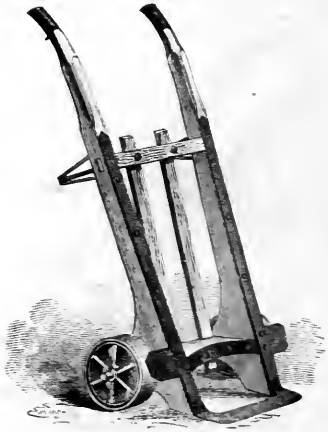

Fig. 173.—Heavy Truck.

The Heavy Truck, represented by Fig. 173. is made very strong, and intended for use in handling boxes of metal and articles of a heavy nature, packed in small cases or casks.

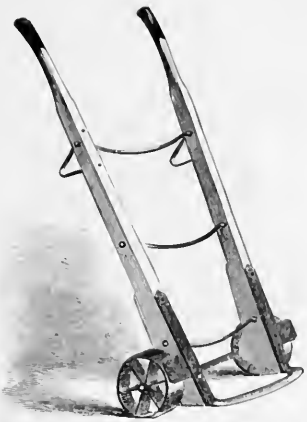

Fig. 174.—Bent Iron-Rod Truck.

The Bent Iron-Rod Truck, represented by Fig. 174, especially adapted for moving barrels and bales, is intended for use in large warehouses, on wharves, and in freight depots.

Fig. 175.—Cotton Truck.

The Cotton Truck is represented by Fig. 175. The wheels are of larger size than those of the store truck, and the lower end is finished, in place of a bar, with flattened points, which, being placed under the bale, allow the handles to be used as a lever, and thus it is easily raised in place.

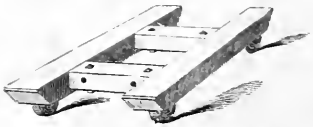

Fig. 176.— Block Truck.

The Block Truck, represented by Fig. 176, is a solid framework placed on low wheels, intended for moving, for short distances, heavy cases.

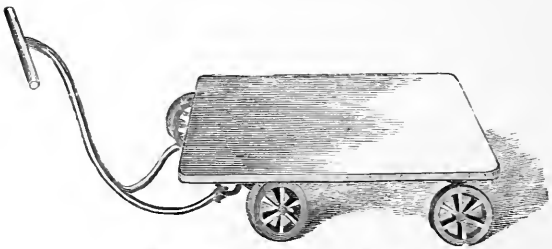

Fig. 177.— Platform Truck.

The Platform Truck, represented by Fig. 177, is used for small boxes of heavy weight, sheet iron, lead, and other metals, also for sides of leather. The handles are detachable, so that the platform can be placed upon an elevator.

We make six sizes.

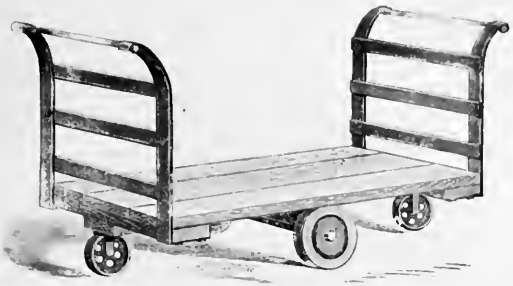

Fig. 178.—Patent Castor-Wheel Truck.

The Patent Castor-Wheel Truck is represented by Fig. 178. The invention is in attaching the swivel wheels to the ends of the platform, and by this means the truck when loaded can be *easily* and *quickly* turned upon its own centre.

The above representation is of the *ordinary size for store use*, but we make them to order of any dimensions, applying the same principles.

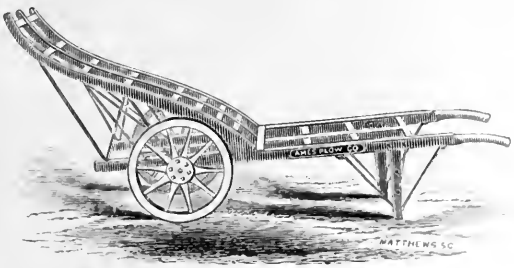

Fig. 179.—Railroad Baggage Barrow.

The Railroad Baggage Barrow is represented by Fig. 179.

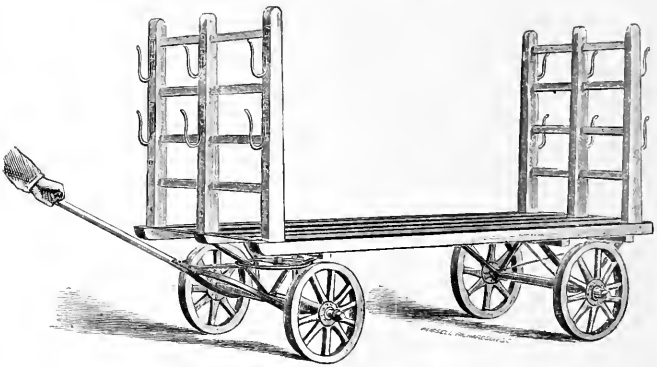

Fig. 180.—Four-Wheel Express Barrow.

The Four-Wheel Express Barrow, represented by Fig. 180, has been adopted by some of the leading Express Companies throughout the country, and has given perfect satisfaction. The materials used are of the best quality.

We make three sizes, 7, 8 and 9 feet long, and uprights 4 feet, handsomely painted and lettered as directed.

The Common Baggage Barrow, represented by Fig. 181, is the ordinary style in general use in railroad depots. It is made strong and thoroughly ironed and braced.

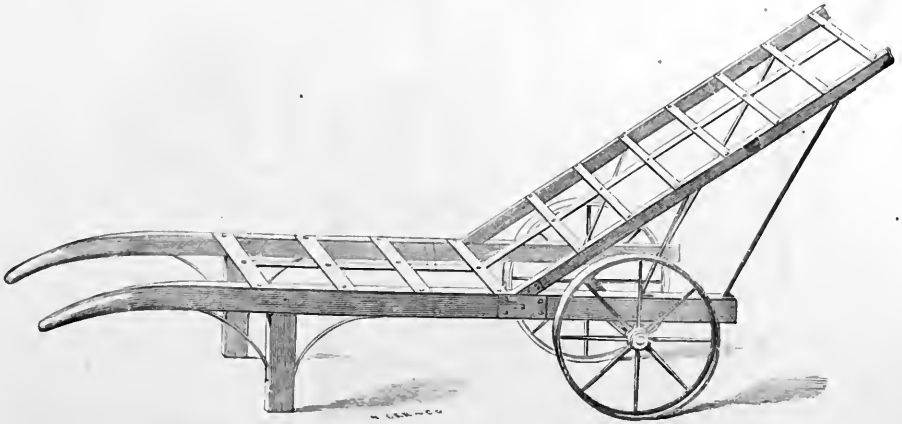

Fig. 181.— Common Baggage Barrow.

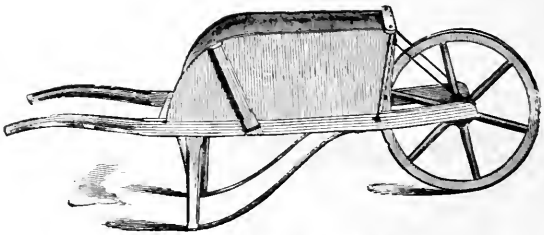

Fig. 182.— Garden Wheelbarrow.

The Garden Wheelbarrow, represented by Fig. 182, is made strong and well braced. We make five sizes, the smallest for boys' use.

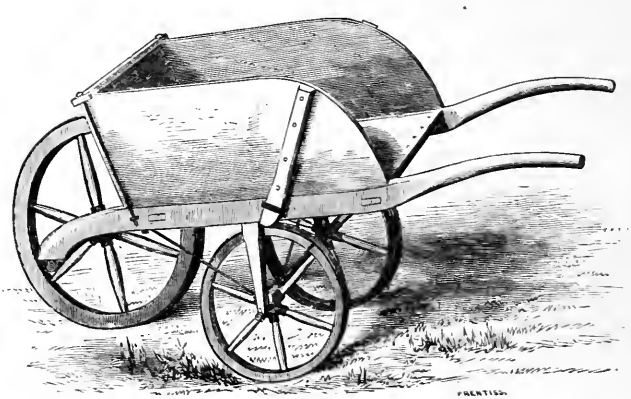

Fig. 183.— Three-Wheel Wheelbarrow.

The Three-Wheel Wheelbarrow, represented by Fig. 183, when heavily loaded can be moved with more ease than the common wheelbarrow, and by bearing down on the handles obstructions can be readily passed.

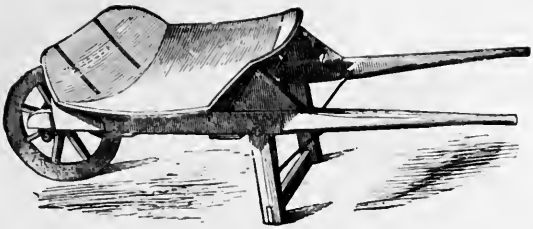

Fig. 184.—Canal Barrow.

The Canal Barrow, represented by Fig. 184, is a cheap barrow intended for use in building railroads and canals. The body is of bent timber, thoroughly braced by iron hoops. They can be taken apart and packed in small compass for shipment.

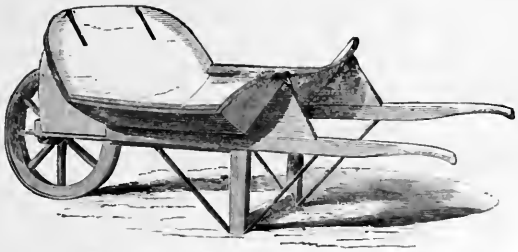

Fig. 185.—Wood-Tray Coal Barrow.

The Wood-Tray Coal Barrow, represented by Fig. 185, is of the same style as the canal barrow, but with larger tray and made very strong. They are for use by railroads and steamboats.

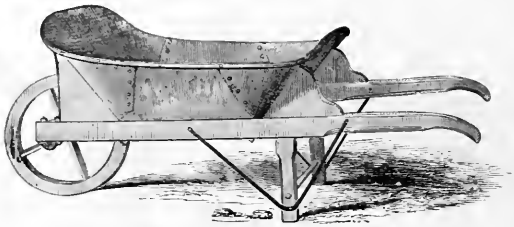

Fig. 186.— Iron-Tray Coal Barrow.

The Iron-Tray Coal Barrow, represented by Fig. 186, is for the same uses as the preceding, but will last much longer; it is made very strong, yet is light and readily handled. It is used in coal yards.

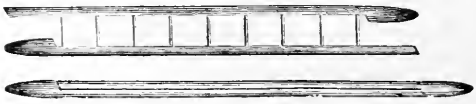

Fig. 187.— Folding Ladder.

The Folding Ladder, represented by Fig. 187, is shown both open and shut. It is very convenient for use in orchards, it is made of various lengths. While shut it may be set up among the branches of the trees, and then opened for use. It is very strong, light and portable.

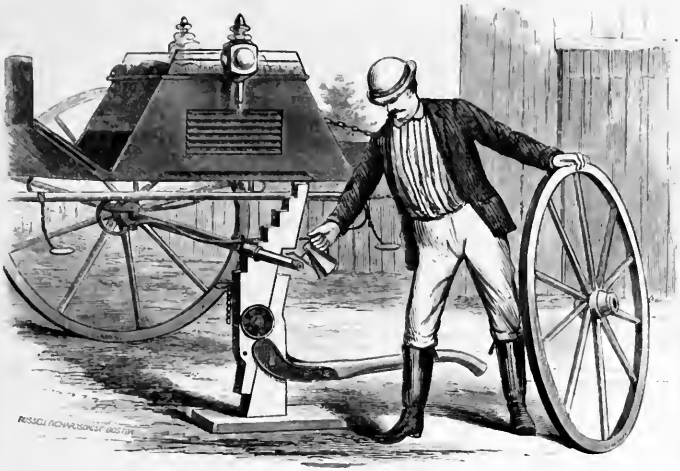

Fig. 188.— The Little Giant Wheeljack.

The Little Giant Wheeljack, represented *in operation* by Fig. 188, has acquired a great popularity. The ease with which it can be operated, its compactness, lightness, and strength have given it a reputation above other implements for the same purpose.

We make four sizes; the three smallest are made either with notches iron-plated or plain; the largest size, for heavy vehicles, always iron-plated.

Fig. 189.— The Road Scraper.

The Road Scraper is represented *in operation* by Fig. 189. The advantages of the use of this implement are not fully understood. If in making roads the plow and scraper were used together in breaking up and removing the soft top-soil, and then with the scraper the hard subsoil was formed into a slightly rounded carriage-way, a hard and firm foundation would be secured.

For use in digging cellars and for the general purpose of removing earth expeditiously this implement is indispensable.

We make six sizes. They can be advantageously packed for shipment.

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