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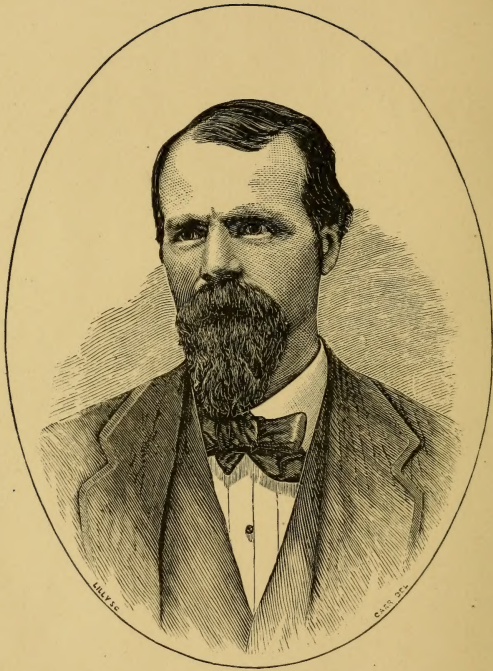
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Yours Truly
William Russell.

RUSSELL

ON

SCIENTIFIC HORSESHOEING

FOR THE

DIFFERENT DISEASES OF THE FOOT.

WITH ILLUSTRATIONS.

BY

WILLIAM RUSSELL,

PRACTICAL HORSESHOER.

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CINCINNATI:
ROBERT CLARKE & CO.

1879.

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INTERNATIONAL EXHIBITION
 1876
 DIPLOME D'HONNEUR
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WILLIAM RUSSELL

CINCINNATI OHIO

HORSESHOES, HAND AND MACHINE MADE; ALSO HORSESHOE IRON.
 NO 192 GROUP XV
 UNITED STATES CENTENNIAL COMMISSION

*In accordance with the Act of Congress,
 of March 3rd 1875, for the purpose of
 exhibiting the products of the various
 States and Territories of the United States,
 and of the other countries of the world,
 at the Centennial Exhibition to be held
 at Philadelphia, Pennsylvania, in 1876.*

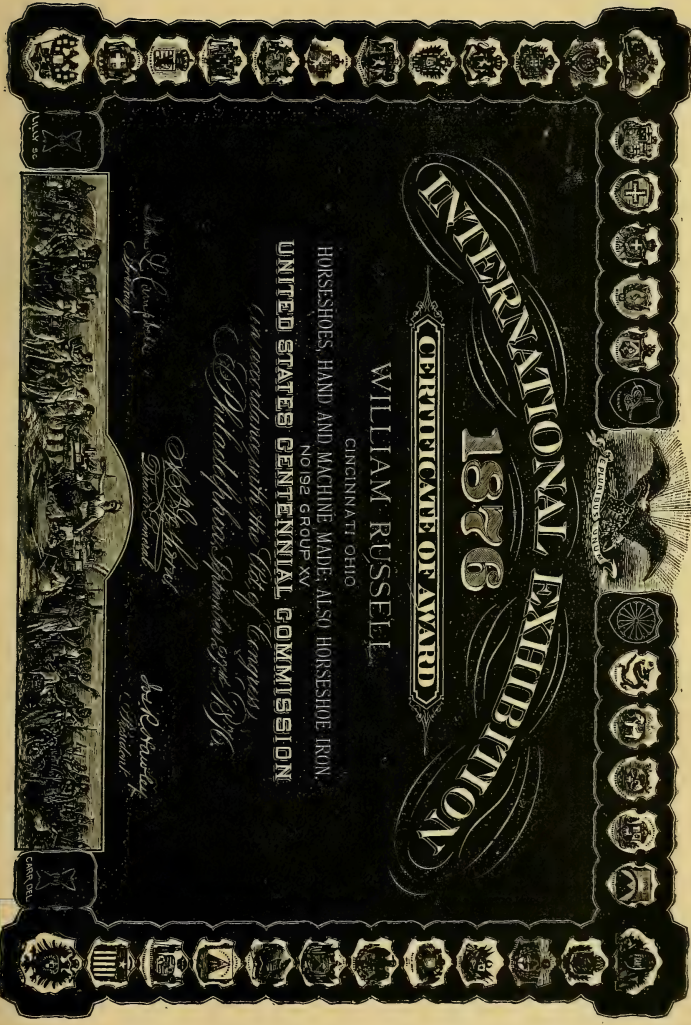
*Wm. Russell
 Cincinnati*

*Wm. Russell
 Cincinnati*



GRAND CENTRAL

MAY 20





INTERNATIONAL EXHIBITION,
PHILADELPHIA, 1876.

The United States Centennial Commission has examined the report of the Judges, and accepted the following reasons, and decreed an award in conformity therewith.

Philadelphia, December 14th, 1876.

REPORT ON AWARDS.

Product: HORSESHOES (Hand and Machine Made); also, HORSESHOE IRON.

Name and Address of Exhibitor: WILLIAM RUSSELL, CINCINNATI, OHIO.

The undersigned, having examined the product herein described, respectfully recommends the same to the United States Centennial Commission, for Award, for the following reasons, viz.,

A variety of shoes remedyng defects in hoofs; also, patented rolled iron, for hand shoe making. All highly meritorious.

J. D. IMBODEN,

[Signature of the Judge].

Approval of Group Judges.

DANIEL STEINMETZ, CHAS. STAPLES, JULIUS DIEFENBACH,
G. L. REED, DAV. McHARDY, J. BAIN.

A true copy of the record.

FRANCIS A. WALKER, Chief of the Bureau of Awards.

Given by authority of the United States Centennial Commission.

A. T. GOSHORN,
Director-General.

J. L. CAMPBELL,
Secretary.

J. R. HAWLEY,
President.



Cincinnati Industrial Exposition.

THE FIRST PREMIUM

AWARDED TO

WILLIAM RUSSELL & SONS,

FOR

Hand-made Horse Shoes

*For remedying defects in horses' feet, and for improvement
in Horse Shoe Iron.*

CHAS. F. WILSTACH, *President.*

CINCINNATI, Oct. 22, 1870.

ABNER L. FRAZER, *Secretary.*

The Medals and Certificates of the Cincinnati Expositions have
been awarded as above for the successive years of
1870, 1871, 1872, 1873, 1874, and 1875.

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PREFACE.

THE present work is the result of very extensive and careful observations, as well as of a practical working experience, extending over a period of more than forty years.

The aim of the work is one and simple. It is to present in the shortest possible space, and in the plainest possible manner, what every man should know of the *Practice and Art of Horseshoeing*.

The experience and success of the author as a practicing farrier, his knowledge of the errors existing in the common mode of shoeing, and the evils which result from them—his careful and earnest investigation of this subject, together with the large series of anatomical parts of the horse's foot which he has amassed in the preparation of this book—have rendered him peculiarly suited to the task he has undertaken, and it is believed that he has produced a compendium of the highest practical value to all who look into it, prompt to avail themselves of the plans herein laid down.

There is the want of a more diffused knowledge on this subject, and it is becoming more and more a necessity of the time that the man "who arrogates to himself the title of farrier" be *qualified* to practice that which he engages to perform.

“It can not require much penetration to discover that *some* study in the nature of anatomy and pathology must be absolutely requisite to constitute a good farrier; but, if conclusions were to be drawn from the basis on which the veterinary system has hitherto rested, it would seem that the science of farriery has been considered a natural gift, and not in the least dependent on the tedious process of medical inquiry and investigation; for every blacksmith, groom and stable-boy, not only conceives *himself* to be, but is likewise regarded by his employer to be, fully competent to the important task of curing diseases of the nature of which he is totally ignorant,” says the ingenious Richard Lawrence.

This book aims to facilitate the understanding of the structure and functions of the horse's foot in all its parts, explains the proper management of it, and points out the sort of shoes which the author's own experience has found to be the best for any given purpose.

One reason why the scientific investigation of these points appears so obscured and bewildered is, because authors have treated the subject in an abstract, technical manner, while very few have been found to agree in the details for carrying into effect a general system.

In this work everything that would tend to confuse the subject has been avoided, the author insisting upon the preservation of his familiar methods of expression.

Those who have a fondness for the *abstruse*, and who would penetrate to the core and go through all the mathematical intricacies of those who have brought *such*

parts of the subject to a high state of perfection, have abundant opportunities of doing it in the many elaborate works which, on alleged rational and scientific principles, have from time to time been pressed forward under the notice of the trade and the public.

All that is claimed for this work is a simple touching up of the facts in the case in a plain, straightforward way; and in this respect the volume now offered to the public occupies a place by itself.

It is proper to add that the author is indebted to Mr. H. A. Carr for his assistance in its preparation, as also for the excellent illustrations which he has contributed to it. The description of the anatomical parts of the work has been carefully corrected by Dr. G. W. Bowler, the distinguished veterinary surgeon, of Cincinnati, and whose labors may justly be considered to have increased their value.

Some observations have been added as an Appendix which may prove of service in this connection. For the statements of law and the notes it contains, I am indebted to the courtesy of Florien Giauque, Esq., of the Cincinnati bar.

The selection of specimens of feet, etc., which, for a long period, have been gathered in contemplation of these illustrations, has been made available to the author through the kindness of Mr. E. A. Thompson, of the Cincinnati Fertilizing Company. They have been of much service in the preparation of this book.

INTRODUCTION.

HAVING carefully perused the manuscript of the work entitled RUSSELL ON SCIENTIFIC HORSESHOEING, for the different diseases of the feet, I can not refrain from congratulating the author on his success in producing so deserving a work and which must eventually bring satisfactory results. It is a work which shows that "theory without practice is comparatively useless."

The author has been steadily engaged in the manufacture of horseshoes for upward of forty years, in which field his opportunities for investigation and improvement in this useful art, have been unlimited, and he has not failed to take advantage of his extensive experience by showing to the world that of all the diseases to which horses are liable, there are none more difficult of cure or of such frequent occurrence as those which attack the foot—that nearly half of the horses that become unserviceable, are rendered so by some defect in the feet, and such defects are most commonly attributed to bad shoeing. The art of shoeing is no longer in its infancy.

Many years ago it was found necessary to protect the feet of horses by means of artificial coverings, but it is a matter of surprise that the method of shoeing most com-

monly practiced in this age of ours should prove so slight an advance upon its most primitive state. There are still cultivated and perpetuated in our midst certain injurious and unmeaning principles in the science of farriery, which have had their origin in the dead past, and which it is a shame to imitate or even allow to exist.

Our author endeavors to bring together and lay before the public, in a plain but comprehensive manner, the results of his extensive experience in modeling shoes and adapting them to the various styles of action to be found among trotting and work horses, and to point out the morbid conditions which may arise from the continued use of an improperly-constructed and irregularly-fitting shoe, together with a suggestion of how to preserve the feet in their natural healthy form, and how to restore them when lost. The work in question will not only be found of considerable value to every horse owner, but will be of incalculable service to the vast body of men engaged in the making and fitting of horseshoes. There are few classes of mechanics who are more disposed to act for themselves than farriers; it is, consequently, above all things needful that they should proceed under safe guidance.

The follies and errors of presuming, but unqualified and incompetent men, both as teachers and practitioners, have hitherto been a serious obstacle to advancement in the art of shoeing; so much so, that with regard to the science of farriery, we have fallen behind the age in

which we live. Duty and justice require that as the horse increases in powers of usefulness to all the purposes of life, he deserves wiser and better means of "protection" than those which doom him to a life of painful labor or constant lameness. We complain of our farriers, but the fault rests not solely with them; it is rather shared by the great body of proprietors, whose interest it is, no less than their duty, to acquire such a knowledge of the nature of the animal economy, the seat of lameness, its causes and cures, as may enable them to preserve this most estimable contributor to our pleasures and comforts from the ravages of a set of unskillful pretenders, whom a little of the pressure from without, as it is termed, would stimulate to wiser and more humane courses of action.

The many works published of late years on this important subject have been little more than a rehash of previous publications on the same subject.

But the abundant material for study and consideration which a *practical* man has brought to the task and adopted in the present work, is an advance out of which good must come, and can not fail to be practically useful as well to the public as to the trade. The author is indeed well qualified for the duty he has undertaken; his work has evidently been a labor of love, and these qualifications, so happily combined, will render the work a valuable acquisition to any library, and an indispensable companion to all who practice farriery, or desire to know

as much of the subject as may enable him to preserve the horse from the unnecessary suffering which so frequently waits upon his footsteps.

GEORGE W. BOWLER, V. S.

140 W. Ninth Street,
Cincinnati, Ohio.

SCIENTIFIC HORSESHOEING.

CHAPTER I.

ANATOMY.

At its commencement, where the true skin begins to produce it, the crust is extremely soft, thin, and white. Its inner surface bears the shape of a hollow ring in this part, and receives the coronary substance or cushion from which the crust is developed. An immense number of foramina, or small pores, are arranged in this groove, and into each of them is inserted the villi, or minute blood-vessels, which secrete the plasma, or horny matter, of which the hoof is formed. This thin extenuation of the crust is called the coronary band, which, being of intermediate density, effects, between the hard, unyielding structure of the outer wall and the pliable texture of the skin which envelopes the lower limbs, a natural and efficient jointure. It acts also as a covering or protection to the wall at its upper part, and before it has acquired sufficient resistance to withstand exposure to the weather. The crust, we perceive, becomes harder and thicker toward the extremities, where it first comes in contact with the ground. It descends obliquely outward, whereby it becomes considerably broader at its

basis than at the coronet. It is of a solid, fibrous kind of horn, much resembling whalebone. In the interior parts of the hoof, these fibers become a laminated substance, which possess great strength and are interwoven with similar membranes, covering the internal parts. The wall, from the coronet to the base of the hoof, diminishes in height as it comes to the heel. In front, it is termed the toe; the sides are the quarters, and the quarters terminate in the heel. The entire interior face of the crust, except the groove mentioned, is lined by a beautiful laminated covering, in the form of thin, horny leaves, which range from the coronary ring to the extreme edge of the inner sole. These leaves or plates vary between six and seven hundred in number, and, being broadest at their base, and terminating in a delicate expansion of horn, may be said to resemble the under surface of a mushroom. They are united, as I have said, with corresponding laminæ on the sensible foot, and these laminæ form so secure a union between the crust and the parts within, that the horse's weight is, in great measure, supported by them. Nor are these membranes possessed merely of great strength; they are also endowed with a considerable degree of elasticity, constituting, as it were, a series of most curious springs, which nature has provided to carry off concussion when the animal is in motion.

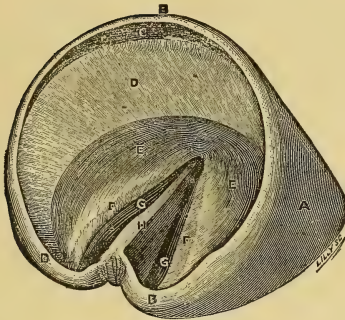


Fig. 1.

VIEW OF A PERFECT HOOF.

- A. Outside crust or wall.
 B, B, B. Coronary band at toe and heel.
 C. Ring or groove for the reception of the coronary cushion.
 D. Sheaths or plates of horny laminae.
 E, E. Upper surface of horny sole.
 F, F. Bars or binders.
 G, G. Fissures between the bars, in which the sensitive frog is imbedded.
 H. Inner spur, corresponding with cleft of horny frog.

As the extremities of the human fingers are the organs of touch, the skin which covers them is very thin and sensitive; but the foot of a horse being required to sustain weight, as well as to have the necessary feeling, is adapted with a better guard, that he may go with confidence and safety, and not be injured from contact with the varied inequalities. It has, therefore, a skin-like covering of a denser nature, being that part of the hoof called the horny sole. The sole is firmly attached to the under side of the coffin bone, and is con-

nected to the wall at the extreme edges of that bone. The sole is concave or hollow, like the surface of the coffin bone immediately above it, consisting of a loose, scaly, and elastic kind of horn, which, like the wall, lies in parallel fibers, and, like them, developed by innumerable vascular and sensitive tufts dependent from the living surface within. The sole scales off after a certain growth, and, by renewing itself constantly, is enabled soon to recover from accidents to which it is liable.

At the posterior part of the hoof the wall is suddenly folded back, as a covering to the cartilages of the foot bone, and terminates nearly in a point, when they have formed a complete covering, at the apex of the frog. These returns take the name of the bars or binders. The inside of the bars, like the inside of the wall, presents a continuation of the horny leaves, thus showing them to be a part of the same substance, and likewise performing the same office. The arch, which they form on either side, admirably fits the bars to admit and limit, to a proper extent, the expansion of the foot, as well as to powerfully oppose any disposition there may be in the hoof to contract, by assisting the heels in retaining their usual form.

The coronet returns from the heel inward and forward like a dart, constituting the last outward covering of the inner sole, and, in this part, takes the name of the frog. It fills up the wide span intervening within the bars, and forms an isosceles triangle, its point being in the center of the sole, then divides into two branches, and runs toward the heel in the form of a fork. The

cleft forms a corresponding spur on its inner face, which imbeds itself into the fleshy frog, and serves the purpose of a fulcrum to the spring when the foot is violently exerted. The frog is united with the sole, but is composed of a tougher and more elastic kind of horn, of a consistency much resembling India rubber. The frog is less compact in its texture than the parts from which it proceeds, but, like other portions of the hoof, it is secreted by villi, which thickly protrude from the overlying membrane. Its fibers differ, however, from other bodies by having a wavy motion which gives it additional strength and elasticity. The frog serves as a cushion and support to the back sinews ; and, as the intervening space between them is filled with a fatty, elastic substance, it forms another of those curious springs with which nature prevents any painful concussion. The frog is enabled to yield to the expansion of the foot by having the cleft or opening that has been described, which expands and contracts upon violent exertion when the frog is permitted to touch the ground. It also yields to the bars in the expansion of the heels, and to the bones in their play upon one another. Like the sole, the frog grows from the internal surface to the external. This growth is perpetual, and is provided against excessive development by wearing off, in flakes, in the same manner as the sole, whenever the horn beneath has become sufficiently hard and dense to sustain contact with the ground.

Having given this short account of the hoof, it re-

mains for me to give a like description of the internal or sensitive foot.

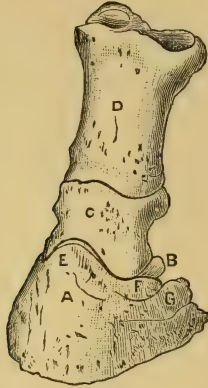


Fig. 2.

A FRONT VIEW OF THE BONES OF THE FORE FOOT OF A HORSE IN THEIR RELATIVE SITUATION.

- A. Foot bone.
- B. Nut bone.
- C. Coronary bone.
- D. Pastern bone.
- E. Point of insertion of the extensor tendon.
- F. Concavity to give attachment to the cartilage of the foot.
- G. Groove which receives a division of the blood-vessels coming round from behind.

The parts of which the internal foot is composed are replete with blood-vessels and nerves, and possessed of a high degree of sensitiveness, and so nicely do they adapt themselves to the cavity of the hoof that they completely fill it, without suffering in the least from pressure, unless the folly and obstinacy of man perverts or

destroys its beautiful structure. Three bones enter into the construction of the foot proper; these are the coffin or foot bone, the navicular or nut bone, and the coronary or lower pastern bone. The above drawing has been given with a view to render the description we are about to give more intelligible to those of my readers who are unacquainted with anatomy, than it would otherwise have been. The coffin bone is the model upon which the entire hoof is constructed. In form it is crescent shaped, with its under surface hollowed out into a perfect arch, whereby the horse is enabled to tread more firmly on the ground, and upon which form, as well as upon its substance and general structure, depends its stoutness and durability. At each of the lower sides of the coffin bone are extensions, denominated wings, which are continued toward the heel, and whose processes give attachment to the cartilages, as I shall hereafter describe.

The navicular or nut bone, is a small bone interposed transversely between the flexor tendon and the other bones, to remove the insertion of the tendon further from the center of motion, when that part of it which unites with the foot bone is forced downward by the violent pressure of the toe against the ground. As this bone projects somewhat, it serves as a pulley for the tendon to slide upon, and affords a considerable mechanical advantage for the action of the flexor muscles of the limb.

The coronary or lower pastern bone which rests partly on the navicular and partly on the coffin bone, is the

point of attachment between the ligaments and cartilages of the foot bone which come just within the hoof at the upper edge of the laminae, forming a kind of circle or crown here extending all round the coronet to the back part of the frog, and fitting into the corresponding groove of the crust already described. This projecting crown is termed the coronary cushion. Its surface is covered with the extremities of blood-vessels, which preside over the functions of secretion and of the repair of the hoof generally. This body in addition is highly elastic, and assists in the springy action ascribed to the laminae.



Fig. 3.

SECTION OF THE FOOT AND PASTERNS, SHOWING THE RELATIVE SITUATION OF THE BONES AND THE INTERNAL MECHANISM OF THE FOOT.

- A. Coffin or foot bone.
- B. Navicular or nut bone.
- C. Coronary or lower pastern bone.
- D. Upper pastern bone.
- E. One of the sesamoid bones.
- F. Cannon or shank bone.
- G. Horny frog.
- H. Sensitive frog.
- K. Sensitive sole.
- L. Horny or insensitive sole.
- M. Outer wall or crust.
- N. Laminated leaves or horny plates.
- O. Sensitive laminae.
- P, P. Tendon of the extensor muscle of the foot and coronary bones.
- R, R. Tendon of the flexor muscle of the coronary and foot bones.

The bottom of the internal foot is formed by the sensitive frog and sole. The sensitive sole lies between the coffin bone and horny sole which is its outward covering; it extends beyond the coffin bone but not under the fleshy frog, over the bars where it is covered with laminæ to unite with those that have been described as found on the bars. It is likewise thicker and more elastic. It is formed above of a ligamentous nature, and below of a skin-like substance plentifully supplied with blood-vessels and nerve fibers. Its office is plainly to supply a new growth for the sole, which it preserves in a proper degree of elasticity. From its position and yielding structure, it also aids in preventing concussion.

The sensitive frog is a duplicate resemblance of the horny frog, to the concavities of which it is nicely adjusted. It is fitted into a fissure formed by the inflection of the bars which prevents its being rendered too wide when it receives the horse's weight. It is attached in front to the sensitive sole, and at the back it adheres firmly to the lower part of the elastic cartilages. Thus formed and located, it is found to be a mass of considerable thickness of a partly tendinous nature, which serves to protect, as by a cushion, the flexor tendon from external violence. Another important function which it also performs, is the lubrication of the entire central portion of the hoof, which it does by straining off onto the surrounding surfaces the oil which is contained in it by capillary attraction.

I have before observed that there are two cartilages

attached to the coffin bone, one on each side. They are connected to the body of the bone by a firm union, being fixed in a broad groove of some depth close to the edge of its articulating surface with the pastern bone, and adhere laterally to the ligaments of the joint. These cartilages are continued upward as high as the upper end of the pastern bone, becoming gradually thinner, till they are insensibly lost and are every-where surrounded and penetrated by a number of blood-vessels. They are attached to the under surface of the wings of the coffin bone, and terminate in a thin edge. The upper and posterior part of this edge is united by strong ligamentous fibers to the under surface of the coffin bone. The cartilages are well adapted to ease shocks and produce that spring to the foot so necessary to the exertion of the horse, as well as to the rider, when the horse is required.

Three ligaments connect the navicular bone to the foot and pastern bones. One of these ligaments takes its rise from the whole length of the rough groove on the lower and back part of the navicular bone, and is fixed to an angular eminence of the foot bone immediately above the insertion of the flexor tendon into the bone last mentioned. This eminence prevents the projecting edge of the foot bone from bearing on the ligaments, even when the horse is in his utmost exertion, and the cavity is filled up by a portion of fatty elastic substance adhering to the upper surface of the ligament.

The two upper ligaments arise from one common or-

igin attached to the whole length of the rough surface of the nut bone, and pass on each side of the joint along lateral depressions in the pastern bone, and having arrived at its fore part, are continued on to the pastern bone, to which they are attached, just above its articulations with the coronary bone. Through their whole course they adhere firmly to the different bones. Where this ligament is united to the nut bone, it is thick and strong, but the upper part and lateral bands send off a very thin ligamentous expansion, covering the fatty substance which lies on the posterior part of the pastern bone and on the upper projecting surface of the navicular bone.

Directly in the front face of the coffin bone, and upon its superior edge, is inserted the large extensor tendon, whose office is to thrust forward the foot and limb in motion. In the center of its lower surface is the ending of the flexor tendon, the muscle that bends and lifts up the foot. Upon the attachments of these tendons depend principally the animal's movements; they are, so to speak, the motor engines of the limbs. An elastic net-work substance envelops them in close folds, for their security and retention in their proper places. This net-work is, in its turn, surrounded by a membranous coating, which is the immediate connection between the inner parts and the horny hoof without.



Fig. 4.

SIDE VIEW OF THE FOOT, TO SHOW THE ARTERIES AND VEINS.

- A. Plantar vein.
- B. Plantar artery.
- C. Membranous covering of the coffin bone.
- D. Plantar nerve.

The arteries and veins of the foot come last under consideration. One large artery, accompanied by one large vein, passes along the posterior concave surface of the cannon bone, covered by the flexor tendon, till they reach the lower surface of that bone. There they each divide into two, and proceed on each side of the flexor tendon, throwing out various ramifications till they come to the cartilages. At this point, on each side, the main trunk sends off two principal branches, one of which passes round the coronet and unites with a similar branch from the opposite side. The other runs along

the cartilage to the fleshy frog, while the trunk itself is continued down into the hollow of the foot, putting out a number of branches in its course, one of which, passing through the cartilages along a groove in the anterior surface of the foot bone, loses itself upon the soft parts which cover it. The main trunk on each side passes along a groove and through openings into the substance of the foot bone, dividing into several branches, which pass out through corresponding openings on the anterior surface of the foot bone, and anastomose with those from the opposite side and with the lateral branches. The veins upon the foot are in infinitely greater number than the arteries. Smaller ramifications, anastomosing universally with one another, form a kind of network over the whole under and anterior surface of the foot bone, while the branches which cover the cartilages are very numerous, and form common trunks of a considerable size, uniting over the anterior surface of the flexor tendon, and likewise again a little higher up under that tendon, finally forming one large venous trunk on each side of the flexor tendon. This appearance of the veins will be better understood by a reference to the plate (fig. 4).

The blood-vessels centering in the foot are accompanied by numerous sensory nerves, which, radiating throughout the entire foot, give to it the necessary powers of feeling, and render the horse sure and careful in his movements. The lower extremities of the plantar nerves are inclosed between the plantar veins and arte-

ries, and enter the foot just above the coronet, passing in a small channel on the inside of the wings of the coffin bone, and firmly united to the lower posterior surface of that bone at either side of the attachments of the flexor tendon.

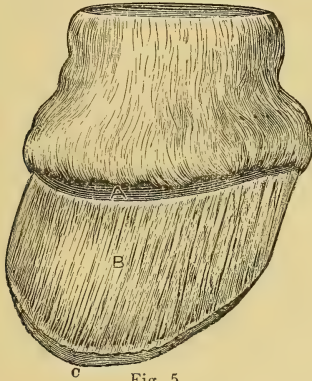


Fig. 5.

FRONT VIEW OF THE FOOT, SHOWING THE LAMINATED APPEARANCE OF THE INTERNAL SURFACE, ADAPTING IT TO THE FIBROUS STRUCTURE SHOWN IN FIG. 1.

A: Coronary substance or cushion.

B. Sensitive laminæ.

C. Fine villous surface, for the purpose of sensation.

A membranous skin surrounds the whole foot like a glove. The part of it which corresponds with the toe, the quarters, and the bars of the hoof is of a laminated texture. The other parts nearly resemble the common skin of the body. These laminæ are extremely vascular and sensitive, and terminate in a fine villous surface,

which forms the organ of touch. These tender, laminated substances differ from that which I have before described, as found on the crust, in possessing numerous blood-vessels, and in their sense of exquisite feeling, they are subject to acute fever and inflammation, through the effects of bad shoeing, hard pulling or traveling, and other like abuses. From their influence, moving, as they do, one in the other, the relations between the coffin bone and the other parts of the hoof are made pliant, easy, and consequently useful. This membrane also covers other portions of the foot, giving it a very high degree of vitality, as well as additional powers of secretion. The coronary and plantar cushions are overspread with it, as also is the sole of the foot bone. Villi, or tufts of blood-vessels, are numerous, and give to those parts the appearance of fine pile or velvet.

CHAPTER II.

THE PRACTICE OF SHOEING.

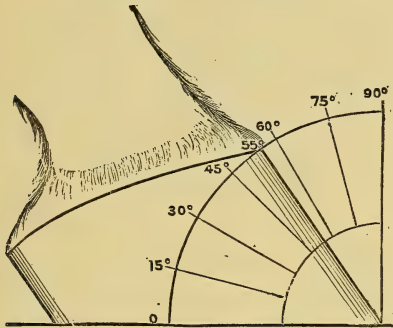


Fig. 6.

SIDE VIEW OF THE HOOF, WITH A SCALE FOR RECKONING ITS PROPER DEGREE OF OBLIQUITY.

N. B. The proper angle to which the hoof should approach is marked in this scale at about 45° or 55° .

THE judgment necessary to know and discriminate between what approaches the natural and the unnatural in the inclination of a horse's foot, is something that can not be too seriously considered by all those who have the management of horses; and especially is this the case with regard to the practicing farrier, since without it the horse has literally no protection from serious injury at his hands. Hence the infinite consequence of

particular care being paid to the due degree of that growth in which the foot ought to be kept, as well as the proper height, weight, width, and length of the shoe and the manner in which it ought to be put on so as to promote the two circumstances of expansion and contraction, which of all others are the most important. Unless these are duly preserved, numerous evils will follow, which I shall hereafter endeavor to explain. The above scale points out the degree of obliquity to which the hoof compares; though this will always be found to differ in different horses, the higher bred horses showing a tendency to a more upright line of hoof than do the other animals, and hence the impossibility of giving one rule to meet such diversified requirements. The foot must be taken and preserved as much as possible in its own natural position. Any foot, however, may be perverted or altered from its proper degree of obliquity, by the farrier paring the heels down and leaving long toes, or by having low toes and high heels. It remains, therefore, for me to point out the means for preserving the foot level and straight. For this purpose, the following diagram is resorted to:

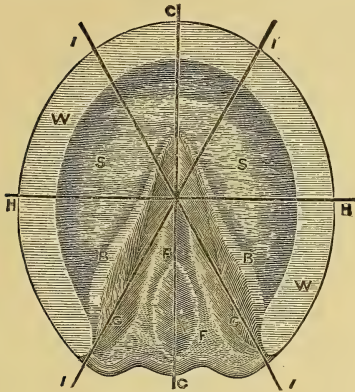


Fig. 7.

SHOWING A PERFECT HOOF PROPERLY PREPARED FOR THE SHOE, TOGETHER WITH A METHOD OF OBTAINING LEVELS.

- C, C. Line through center from toe to heel.
 H, H. Line through center of quarters.
 I, I, I, I. Intersecting lines marking the width of heel and sides of toe.
 B, B. Bars.
 F, F. Frog.
 G, G. Grooves, called commissures.
 S, S. Sole.
 W, W. Wall bearing surface.

Notwithstanding the many difficulties that are made out to be in keeping the shape and structure of the horse's foot sound and unimpaired by any mode of shoeing, I will venture to affirm, in the light of my experience, that it is a very simple process, and easily to be ac-

complished by any one who will attentively consider the principles I shall lay down. In order to be got into condition for shoeing, the first object of attention is to bring the foot to a *perfectly level bearing*. If this is properly managed, the secret of success in farriery is resolved ; for I am convinced that this is the most important qualification connected with the art of shoeing, and by keeping in view this single principle, I have done more for the improvement of the strength or perfection of the horse's foot than I could by learning all the mysteries of the veterinary school. In Fig. 7 is represented a perfect foot properly prepared for the shoe. This may be taken as a standard of perfection, from which the goodness of feet in general may be judged of. If we wish to examine a perfect foot, such as nature made it, it is generally necessary to find one that has never been shod, for the common mode of shoeing is so frequently destructive, that we seldom meet with a horse whose feet have not lost in some degree their original form, and this deviation from their natural shape is generally proportioned to the length of time he has worn shoes. From this circumstance, writers on farriery have been led to form various opinions respecting the most desirable form for a horse's foot, but had an ever provident nature been consulted this variety of opinion it seems to me would never have existed. They would have been convinced that the feet of all horses in a state of nature, or not improperly shod, are nearly of the same shape, and surely no one will dispute that this form, which the Creator has given them,

is the most perfect, and far better adapted to all the purposes for which the animal was designed, than any that can be given by the most ingenious farrier. If we examine the natural feet of many horses, it will be found that their essential shape is the same. Some may have grown more luxuriantly than others, it is true, whereby the crusts will be deeper and the bottom part may be broken, so as to give the foot a ragged and uneven appearance, but when this superfluous horn has been removed it will be found that the bottom of the foot will be like the accompanying figure, nearly circular; the sole concave; the bars distinct; the frog open, and the heel expanded.

In preparing the horse's foot for the shoe, it is necessary to be well acquainted with its natural form, in order to determine how far it has been altered or destroyed by any plan of shoeing. For example, take a horse that has a sound, well-formed foot, let it be improperly pared, and let bad shoes be applied, in all probability lameness will not be the immediate consequence. By a repetition, however, of this practice, it will be found that the original shape of the foot is gradually altered, and eventually it will be so far deformed as to produce, perhaps, incurable lameness; therefore, we ought not to be satisfied with a plan of shoeing merely because a horse is not immediately made lame by it, but should examine also the effect produced by it upon the shape and structure of the foot; and this rule may be invariably depended on, that any mode of shoeing and treating the foot which

has a tendency to alter the form given it by nature is highly absurd and destructive, while that practice which tends to preserve its original form is founded upon sound and rational principles. When, therefore, we undertake to get a horse's foot into condition, it is important to be very particular in bringing it to its best form, as there are many apparently trifling circumstances which have much to do with what is termed *good feet*, though generally little attended to.

It is on this ground that I think it necessary to recommend to every farrier the use of the compasses (see Fig. 8) in bringing the foot to its proportionate level.



Fig. 8.

SMALL HAND-COMPASSES, FIVE OR SIX INCHES IN THE BRANCH, FOR MEASURING THE FOOT.

I can truly assert, that I have seen many instances of the injurious effects of a want of care in properly balancing the foot, which, had a little judicious care been

exercised in respect to the method of leveling the foot, might have been entirely obviated.

It is my practice to first ascertain the height of the heels opposite the lines, I, I, by measuring with compasses from coronet to ground surface; then the quarters above the lines, H, H, and likewise the sides of the toe, opposite the lines, I, I. In the same manner, on the bottom, the foot is to be measured at the lines, H, H, where its diameter is the greatest from the middle of the frog to the outside rim of the hoof. By thus ascertaining the gradations of the foot, and duly proportioning it, before shoeing, to that degree of safety possible, there is no doubt that the strength and general condition of the foot will be brought to the highest state it is capable of attaining. In the foot prepared for the shoe (Fig. 7), the lower part is to be reduced when too full; that is, the superfluous horn is to be cut away, more particularly at the toe, and, by means of a buttress or rasp, a broad, even surface made for the shoe to bear upon; the loose, scaly parts of the sole are to be removed, so as to preserve its concavity; and if any ragged parts are observed in the frog, they are to be carefully removed with a knife. The junction of the bar and crust is a natural, firm bearing for the heel of the shoe, and is to be rasped perfectly flat and even, and so low as to be exactly on a level with the frog. Indeed, the whole bottom of the crust is to be made equally on a plain surface, at the same time, with the rasp, that the shoe may bear equally on every part of it.



Fig. 9.

REPRESENTING THE BACK OR SOLE BEARING PART OF A SHOE, WITH INSIDE EDGE CONCAVED, AND FLAT SURFACE FOR THE CRUST TO BEAR UPON.

Thus do we prepare a foot for the shoe, and to a foot of this description the shoe (Fig. 9) is to be applied. This shoe should ordinarily be perfectly flat on the ground-wearing part, but is to be worn concave on the surface next the foot, else it will be apt to produce lameness by pressing on the sole. I have shown that, in a sound foot, the sole is always concave, and it might be supposed that it can not possibly receive any pressure from a flat shoe. But when a horse is exerting himself, either in galloping or drawing burdens, the sudden action of the animal's weight causes the laminae to gradually lengthen and suffer the coffin bone to press on the sole, its concavity and elasticity allows it to descend and expand, and that gradual yielding must materially en-

danger the sole by a violent contact with the shoe, were it made otherwise than hollow; and it must be granted, too, when a foot is pared in the common way—that is, when the frog has been mutilated, the bars destroyed, and the sole weakened—the danger of injury is proportionately lessened with shoes concaved on the back.

The shoe should not be unduly wide. Narrow webbed shoes are eminently the best, as they allow the sole to exfoliate or scale off, according to its growth, which tends to preserve its strength and condition. The shoes vary, according to the necessities of the case—for a middle-sized horse, being about one-half inch in width and three-eighths in thickness.

The weight of the shoe is a consideration of such importance that I can not account for its having been generally overlooked. The constant pounding with iron-weighted feet on the hard roads and stones of cities, I am satisfied, serves to jam up more of our best animals than almost any other cause. It is not a little strange that so many farriers should fail to see all this, and set about remedying it. I am not prepared to believe that shoes weighing several pounds are necessary for even our heaviest horses, when an equal or greater advantage is to be found in shoes weighing only half as much. Common sense declares against it, and it is fair to assume that by wearing heavy shoes, as well as by leaving them on so long, the majority of our horses are at the decadence of their powers, when they should be at their prime. Calculating that a horse going a fair trot lifts

his feet all round sixty times a minute, and this with shoes weighing two pounds each, the reader will be able to realize how enormous the amount is that can be unnecessarily raised to the wear and tear of the living members.

It will probably be observed of the shoe which I have recommended, that it involves the principle which has been laid down respecting the necessity of the frog's receiving pressure. This I believe to be an incontrovertible fact, that, unless the frog receives a certain degree of pressure, it will become hard and dry, and incapable of affording sufficient protection to the sensitive frog, which it immediately covers, and that the heels will gradually contract, and the natural form of the foot be destroyed; for I have seen that the bars alone are not sufficient to *prevent* contraction, though they certainly oppose it with considerable force. It will be proper to observe, however, that when a horse, even with a sound foot, has worn shoes that are very thick or turned up at the heels, particularly if at the same time the crust at the heels has been suffered to grow so high that the frog is kept at a considerable distance from the ground, it would be very improper to reduce the heels suddenly, so as to allow the frog to receive pressure, since the back sinews would in this case be injured, and lameness might ensue. In feet of this description, it is necessary to remove from the toe all that can be done without exposing the part too much, and to lower the heels gradually. It may be observed that in the illustration (Fig. 9) the nail holes are not

brought near to the toe, but a considerable way round from it; place the nails in the quarters, by which the shoe is certainly rendered more secure than it would be had they been placed nearer the toe. In shoeing the hind feet the nails can be placed well back at the heels, as the quarters and heels are the strongest and thickest. The nail holes should be punched through the shoe straight, except in cases, as otherwise directed, that all danger of cramping the foot may be avoided when the nails are driven. A low, short, thick hold for the nail is better both for the ease of the foot, as well as for the greater security to the fastening of the shoe. By driving the nail in this manner, it will be perceived that they pass obliquely out of the hoof, and escape the tendency which commonly prevails in nailing to prick or wound the sensitive foot. It is reasonably objectionable against large bladed nails, that they not unfrequently break and weaken the wall. Small nails are preferable, and if there be a level bearing of the shoe upon the foot, they will serve the purpose as well or better than those of larger size.

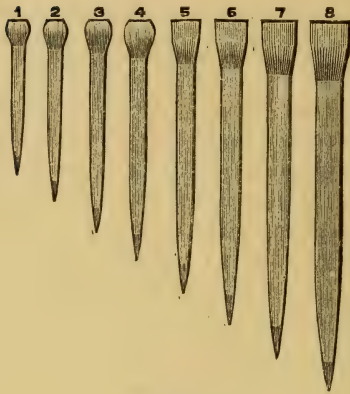


Fig. 10.

THE PATTERNS AND SIZES OF NAILS, WITH RECOMMENDATIONS FOR THEIR USES.

- No. 1. For plating running horses and colts.
- No. 2. For training shoes on running horses.
- No. 3. For the track horse.
- No. 4. For the roadster.
- No. 5. For general business and hack horse.
- No. 6. For omnibus and stage horses.
- No. 7. For light draught horses.
- No. 8. For heavy draught horses.

After the nails are driven, file or rasp the crust slightly underneath the clinches before laying them to the foot. In turning the clinches down, they should be put directly with the angle of the foot. In punching the nail holes, they must be straight; or, if any deviation made from this, the nail should incline outwardly.

CHAPTER III.

SHOEING OF DIFFERENT KINDS OF HORSES.

THE horse, in his animal organization and external characteristics, is strongly marked; but constant as are these general characters, the figure of the horse is as varied as the purposes for which man employs him. If he differs in different countries in form and in size, it is from influence of climate or cultivation, but otherwise from the war-horse in the grand description of Job, or as he is depicted in the friezes of ancient temples, to the fleet and beautiful Arabian or diminutive Shetlander, there is an evident similarity of form and destination which clearly stamps his common origin.

Although such variation in external form is particularly marked at the present day, when the horse is so universally employed, and when, as a rule, each description of work is performed by an animal having qualities especially adapted for it, such was not the case in the earlier ages of the world. Horses were then chiefly devoted to the purposes of war or pleasure, and there was little need for any great diversity. In early historic times the horse was rarely, if ever, used for draught or agricultural purposes. Oxen were then the only animals engaged in the laborious operations of husbandry. But the beauty and convenience of the horse, as well as his

strength and tractability, have now connected him with almost all the purposes of life, and his existence and services are most closely connected with the natural, social, and commercial advancement of the world.

The Draught Horse.

Having already shown the proper method of preparing the perfect foot for the shoe, and explained the conditions best adapted for preserving its vigor, it will be necessary now to give more particular consideration to the special purposes of shoeing. This is a subject of considerable importance and requires more attention than is commonly paid to it, as the safety, speed, and endurance of the animal greatly depend upon the adaptation of his shoeing to the nature of the work he has to perform, and at all times a careful application of it to the state of his foot. This, indeed, constitutes the most difficult part in the art of shoeing, for it will at once appear that all feet, differing as they do in conditions and uses, can not be alike operated upon, nor can one kind of shoe be supposed to answer the purposes of all. Thus it happens, in this pursuit, that a want of attention to the means employed, or a regard for the consequences, must lead to very serious defects, and render worthless shoes of the best form. When, therefore, we undertake to put a horse's foot in order, it is necessary first to inquire for what kind of labor he is designed, whether it be for the turf, for business, or the road.

In preparing for the shoe the foot of a draught horse,

it seems almost superfluous to observe that the most essential requisite for a horse of this description, is that he shall be strong and well-footed, as, when burdens are placed upon his back, and he is driven about upon hard roads, he is certainly circumstanced for hard and solid hoofs if ever horse was. Yet how frequently do we meet with horses that are weak and tender in the feet, and how subject are they to mishaps from this tenderness, which generally arises from the stupid opinion of some farrier and a neglect of these precautions. In respect to feet of this class, it is necessary to afford the crust a firm bearing for the shoe, that it may be adequate to the heavy burdens which it has to sustain. Let the bearing surface be good and broad, and prepared in the manner already described. Have particular care that the sole is not pared away or weakened, which would, of course, expose the foot to occasions of accident and lameness. The junction of the bar and crust affords a firm support for the heel of the shoe, and is to be rasped perfectly flat and leveled with the frog; but the connection between the bar and the crust is not to be impaired, and the frog and heels allowed to remain entire, and all the available strength of the foot will thus be obtained. The toe is to be shortened as much as can be conveniently done, but the external face of the hoof must be carefully preserved from tooth of file or rasp. The shoe for draught horses should be moderately heavy and as narrow in its covering as the nature of the case will allow. When the shoes for draught horses require calks at toe and heel, they

should be low and of equal height. The practice of hot-fitting and clipping is very destructive. Burning the sole will, in time, partially destroy the sensitive laminæ, and impairs the membranous lining underneath the coffin bone, as well as closing the pores of the horn, causing the hoof to become hard, dry, and brittle. It also impedes, to a certain extent, as a necessary consequence, the healthy growth of the hoof. The advocates of hot-fitting present many specious reasons for the furtherance of the practice. It is alleged that shoes can not be fitted so rapidly nor as closely by any means other than that of hot-fitting; and this is generally true, for, by this means, the hoof is burned to correspond with the inequalities which occur on the surface of the shoe, until the latter is thoroughly imbedded in the horn. On the other hand, however, this fusing of the horn is in opposition to its right growth and operation, and is the prolific source of many evils and abuses. Horn, being a non-conductor of heat, is slowly affected by it, and it is said that three minutes' burning of the lower face of the sole is necessary to produce any indication of increase of temperature on its upper surface. This is a fallacy, as I have proven many times, by operating upon green specimens, with soles of varied thickness, in which case, the soles of ordinary depth were penetrated by the heat, when heated shoes were applied for the time specified, and the sensitive sole was found to be scorched, as well as the laminæ, in its connections with the sole, burned and charred. In the living subject,

these effects would have wrought serious results. They have convinced me that the foot of a horse may in no sense be compared to an inanimate block of wood, which may be charred or carved as caprice may dictate. And because it is not, and because it is filled with life and feeling, the necessity which there is of thought, care, and skill being exercised in regard to it, is pointed out to us. The economy of labor attained in the process of hot-fitting, will, I am sure, never counterbalance its evil effects. While it is true that more shoes can be fitted in a given time by hot-fitting than by cold, that is no argument against the expediency of the latter, as much or more might be said of any other part of the work.

The Racking Horse.

The rack is altogether an acquired pace, being unnatural to the wild horse, and is performed by two legs of the same side moving in exact correspondence with each other. The action is a rapid one, and is very easy and pleasant for the horseman, but extremely tiring to the horse.

Much judgment is required in shoeing this class of horses, as there is great liability to pull off the front shoes, by an overreach of the hind feet.



Fig. 11.

ENGLISH SEATED SHOE.

For this horse, a shoe well concaved on its ground surface, as seen in Fig. 11, is required to insure a firm foothold, as well as to provide against the mischance of picking up stones. In dressing the foot, follow the instructions given in the previous article for that purpose. The hoofs of the fore feet must remain very strong, and if the action of the front quarters is found to be slow for that of the hind quarters, it will be necessary for a change to be made in the shoes. In such a case, a pattern, known as the scoop-toe rolling-motion shoe, and which is indicated in Fig. 46, should be adopted. The effect of this style of shoe will be to quicken the action of a horse in front, by means of the "roll" in the toe. This effect can also be accomplished by the use of the plain rolling-motion shoe. In addition, also, the hind

feet must be shod with a light concaved shoe, with small heel calkins. These shoes will render the horse sure-footed, and enable him to move with ease to himself, producing that graceful carriage so much desired by the pleasure rider.

The Pacing Horse.

Like the rack, this gait is performed by two legs of the same side moving at the same time. Thus half of the body is moved forward, while the weight of the whole is supported on the other. The pace is altogether an artificial movement to the horse, and is a very rapid gait.

In shoeing the pacer, as light a shoe is required as is consistent with safety. It should be so made as to be concave from the outer rim of the shoe to the sole of the foot. This will have the effect of giving the horse a firm foothold, and thus shod he is not so liable to twist his foot or slip while in motion, as he would otherwise be. The hind foot shoe should, in addition, have small heel calkins, so as to serve as a check when the foot lands upon the ground. The directions given elsewhere should be observed in this case, when dressing and paring the foot.

The Track Horse and Roadster

will require more skill and judgment in shoeing than any of the preceding. The feet should be pared down level and straight, as well as evenly balanced from coronet to ground surface. The toe, also, should be short-

ened as much as safety will permit, leaving the frog, bars, and heels unmolested. The shoe should rest evenly all around the foot, and at the point of the coffin bone there should be no pressure upon the sole, as such pressure would be injurious to the bone and sole, when the horse is in violent motion, sometimes producing soreness and lameness. The track horse requires to have his shoes well concaved on the ground surface, and his hind shoes to have small heel calkins. The nail holes should be punched straight, and the nails small. Reset the shoes every three or four weeks, and have them fit snugly to the foot, to obviate the danger of pulling them off by an overreach.

The Running Horse.

In the running or race horse, the farrier meets with a more carefully kept, and consequently a more perfect, hoof than in horses of any other class.

The care bestowed upon the race horse begins with foaling; hence the strength of the foot is not in the least impaired. The foot is not deprived of its proper degree of moisture and elasticity by injudicious methods of shoeing, and, in fact, the race horse is the only class of horses whose feet are cared for according to their natural requirements. When properly shod, their training shoes are quite light; small nails are used, to prevent injuring or weakening the hoof. Before racing, however, their training shoes are removed, and racing plates applied in their stead. The weight of these is



Fig. 12.

RACING PLATE.

about one and a half to two ounces, the width being about three-eighths of an inch, and the thickness scarcely to exceed three-sixteenths of an inch. The shoes must be well concaved on the ground surface, to prevent slipping upon it, being evenly fitted all around and nailed solidly to the heels, at the extreme points of the shoe, to prevent it springing or twisting upon the foot during the violent exertions of the horse. The free, easy, and vigorous action of a perfect foot is here exhibited in a first rate manner. The frog, bars, and sole being left intact and unrestrained by the shoe, the foot expands and gathers itself naturally together again at each stride which the horse takes.

CHAPTER IV.

DISEASES OF THE FOOT.

AMONG the various diseases to which domestication and improper management have subjected the horse, there are none of such frequent occurrence, or that are more often obstinate and difficult of cure, as those which attack the foot. And what makes this subject of the first importance is, that unless a horse's foot be perfectly healthy and sound, his capabilities for speed and exertion are in some manner and to some extent seriously impaired and his vigor proportionally affected. Another consideration I must suggest is, that these diseases, when allowed to exist by neglect, or when improperly treated, are oftentimes productive of permanent injury and severe lameness; whereas, by seasonably applying proper remedies, the feet have been perfectly restored.

Since a large proportion of the defects in horses' feet originate and are developed by bad methods of farriery, it must surely be of sufficient importance to every man who values his horse, to acquire such a knowledge of this subject as may enable him to preserve and defend so useful an animal from the multitude of afflictions and injuries which a set of unskillful pretenders bring upon him. It remains for me, therefore, to treat of those diseases separately, to which I have briefly alluded, and de-

scribe particularly under this head their nature and causes, together with the most effectual mode of treatment which an extensive practice in shoeing has suggested to me.

Founder and Laminitis.

Founder is a disease which requires the most prompt and efficacious treatment, and unless speedy relief be afforded the complaint increases and soon degenerates into a more serious form of disease, and proves extremely difficult to cure. It may arise from various causes. The following, I believe, are those by which it is generally produced: 1. Drinking freely of cold water when heated by violent exercise, particularly when such exercise has been continued for some time. 2. Exposure to cold wind or rain under the same circumstances. 3. Immoderate allowance of corn. This complaint consists in inflammation or fever, and begins with an appearance of weakness or loss of vital energy, then followed by stiffness of the legs and body.

At the first attack of this malady, immersing the feet in tubs of warm water for twenty-four hours will generally be found an effectual remedy; but if it be neglected, it is most commonly succeeded by laminitis. Laminitis exists in the form of local inflammation in the foot which very soon diffuses itself to the laminated structure, and does great injury to these important membranes, occasioning severe pain and lameness, and proving extremely difficult to cure. When we consider that the horse's

weight is suspended by these laminæ, as a carriage by its springs, and though the bottom of the internal foot is in contact with the sole, it, nevertheless, does not press upon it considerably, except when the horse is in motion, and the back part of the laminæ elongates and descends upon the sole in a small degree, it will readily appear that when these elastic membranes are no longer capable of supporting and moving under the weight, the internal foot must press upon the sole which flattens or convexes it, and is more commonly termed the drop sole or pummice foot. When the laminæ are thus affected, the malady generally proceeds to a complete separation between the crust and the internal parts. The crust then loses its proper form, and becomes flatter, appearing as if it was forced upward from the ground. When this separation takes place, the accidental cavity is filled with a precipitation of horny fungous matter.



Fig. 13.

SECTION OF THE FOOT.

- A. Coffin or foot bone.
- B. Navicular or nut bone.
- C. Coronary or lower pastern bone.
- D. Upper pastern bone.
- E. Sesamoid bone.
- F. Cannon or shank bone.
- G. Horny sole deprived of its substance and flattened or bulged down.
- K. Sensitive sole.
- M. Crust broken and forced out of its relative position.
- N. Laminated substance, and seat of laminitis.
- O. Fungous growth.
- P, P. Extensor tendon.
- R, R. Flexor tendon.

It is first necessary to shorten up the toe as much as can be done without injury. As the sole, in this condition, is thin and weak, care must be taken that it is not cut or pared in any way. In preparing the foot for the proper levels of the shoe, commence at the heel, lower

both sides as much as can be safely borne, and this operation must be carried forward toward the quarters. When the sole is badly dropped, it will sometimes be found impossible to get more than two or three inches of level surface for the shoe to bear upon. The front part of the hoof must next be weakened, by rasping from coronet to ground surface, until serum is apparent, extending this operation back to the quarters. When the foot is thus prepared, a shoe as shown by Fig. 14 is to be applied.

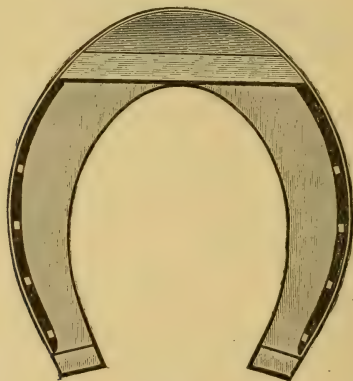


Fig. 14.

SHOE FOR DROP SOLES OR FLAT FEET.

By having the toe set well back on the shoe, the center of gravity will fall more directly under the bearing of the foot and leg bones, and the strain is partly taken off the weakened laminae. If the foot be wide at the heel and quarters, clips should be drawn up on both sides

of the shoe, opposite the wings of the coffin bone, that the hoof may be retained from further expansion. Clips are not to be used at the front; bevel the front part of the shoe at the toe on the ground surface, to prevent the horse stumbling or tripping. Reset the shoes every three weeks, by lowering the heels again, and, by so doing, the foot gradually permits an increased bearing toward the quarters, and, in four or five shoeings, the sole will return to its natural concave form. Do not file or rasp the new growth. By the application of cold water to the coronet, by means of a swathing of the parts with a loose pad at night, the new growth will be stimulated.

The shoe being nailed solidly at the heel, it will be readily seen that, the front part being released, and an open space intervening between the foot and the shoe, at every step which the horse takes forward, the foot presses down to meet the shoe, and just in proportion as the foot springs down, the sole will be returned to its natural cup-like form.

Founder and laminitis are not the cause of all drop soles. Springing the shoe off the heels, thereby breaking down the quarters, will also produce flat feet, especially in this case, with large draught horses, that have low, broad heels.



Fig. 15

SHOWING THE SEVERE EFFECTS OF AN EXTREME CASE OF LAMINITIS UPON
THE FOOT BONE.

(This specimen loaned by Dr. Bowler.)

The above specimen is one of the results of acute laminitis. The bone has become much distorted from its original form, from the pressure of the part constantly under weight when the sole has become dropped, and the upper surface had “dished,” as it were, or fallen in, until only one-half its original height, while it had grown all over it, an immense number of small spines or thorn-like spurs, and the lower part of the bone convexed in an extreme degree, bulging down until it had lost all semblance to its original shape. The destructive effects of this disease upon the internal structure of the foot are well displayed in this drawing. When this disease becomes chronic, it is generally pronounced incurable; but by proper management of the foot, as explained in case of founder and the use of the shoe (Fig. 14), the horse will be greatly assisted in his movements, though he must only be used for slow work. For relative comparison, height, and angle, see Figs 2 and 3.

The falling or dropping of the sole of the hoof originates, or is rather the result of a severe attack of lami-

nititis, because, where we find this inflammation of the sensitive laminæ existing for a length of time—that is, until it has been prolonged to the suppurative stage—the laminæ become detached from each other; consequently, the support is gone, and the weight of the body forces the coffin bone down upon the horny sole, and from this time forth the bulging or dropping of the sole continues, the coffin bone becomes deformed, its concave surface becomes convex, the weight is thrown backward, the coffin bone curves upward at the toe, and the sole of the hoof naturally conforms to the changes of the inner structure. (See Fig. 13.)



Fig. 16.

SEEDY TOE.

This specimen shows the effects of laminitis, and a neglect in paring and leveling the foot, the wall becoming twice its natural thickness, and hard and dry. The toe had been allowed to grow more than two inches too long; the outside of the hoof had grown rough and ridgy; on the inside of the foot certain portions of the

horny leaves had given way, and looked honey-combed, while other portions were comparatively sound and healthy. Laminitis does not always affect all the laminated structure; certain portions only are at first diseased, but, if allowed to continue any length of time, the whole substance may become involved.

For a foot affected in this manner, pare and level it as low as the safety of the foot will permit; thin the outer wall from coronet to ground surface, by rasping or filing it, and, if the foot shows signs of tenderness in the sole, it must be protected by using a broad webbed shoe, well concaved on the sole bearing surface, the nail holes to be punched where the foot appears to be least affected. Apply a shoe such as that seen in Fig. 14, or the four calkin shoe (Fig. 32), or the scoop toe rolling-motion shoe (Fig. 46). Cold water bandages may be used in keeping the foot moist.

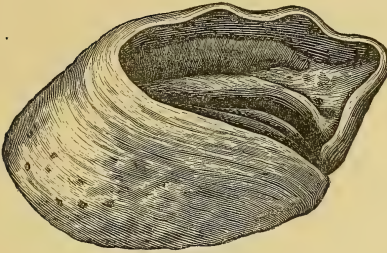
Distortion.

Fig. 17.

The above figure represents a view of one of the many morbid specimens of feet which I have in my possession as relics of improper shoeing. It is here introduced as one of the results to the hoof from uneven bearing upon the ground surface. The reader will perceive that one side is short and thick. The inside view discloses a fungous growth of the diseased laminae. The circulation of the blood was in this case impeded, and the natural, free, unrestrained growth destroyed and deformed. This latter fact plainly evidences that the foot was unevenly shaped, resulting in heat and inflammation and lameness as a final consequence.

In order to fully explain how these effects are brought about, the following diagram, drawn from nature, is resorted to.



Fig. 18.

BACK VIEW OF THE BONES, THE LINES A, B AND C, HAVING BEEN DRAWN IN ORDER TO SHOW THE DEGREE IN WHICH THE FOOT WAS TILTED ON THE GROUND SURFACE AND DISPLACED AT THE KNEE.

- D. The foot bone
- E. The navicular or nut bone.
- F. The lower small pastern bone.
- G. The upper large pastern bone.
- H, H. The sesamoid bones.
- I, I. The cannon bone.
- K, K. The splint bones.

It will be seen that the bearing surfaces of the foot

bone are unevenly placed. The bones, in consequence, are tilted from their vertical bearings, and the articulations of the joints receive an unequal amount of weight. In the present subject, the weight was thrown onto the outside parts, and the diminution of the blood and synovial fluids, through their ducts, caused the cartilage of the foot bone, on its lowest side, to become ossified, and project upward at least two inches above the coronary band.

The epiphysis covering the knee joint had become worn entirely away on its side of greatest elevation, and the bones, deprived of their protection, had scored their surfaces together, until they had the appearance of having been rasped with a coarse file. The splint bone, on the inner side of the cannon bone, had grown solidly to the substance of that bone, and elongated fully three and a quarter inches beyond its normal shape; indeed, the entire bony structure of this specimen had become enlarged and distorted fully one-fourth its natural size. The connection between things apparently small and great interests is effectually illustrated in the present example.

Suppose that one side of the hoof is allowed to become one-quarter of an inch higher than the other, as not unfrequently happens from improper paring of the hoof, we find, by calculation, that the joint of the knee will be greatly thrown out of position. If the width of the foot be four inches, and the leg from the knee to the ground surface twenty inches, then a displacement of

the foot one-fourth of an inch would displace the knee-joint five times as much, namely, one and a quarter inches. This horrible displacement effects serious results ; the functions of the foot and leg are impaired, and their whole structure seriously injured.



Fig. 19.

OSSIFIED CARTILAGE.

- A. Body of the coffin bone.
- B. Winged extension or heel.
- C. Ossified cartilage.

Under this head, I have briefly alluded to the ossification of the lateral cartilages of the foot bone. Heavy draught horses are most subject to this disease, but it is not confined to them alone. Horses designed for fast work, and well-bred carriage horses, are not exempt from its attacks. The disease is generally considered incurable. It is not possible to convert in the cartilages again the natural properties when they once have been destroyed. The symptoms of the change from cartilage into bone is an enlargement of the back part of the coronet and heel. I have said that the cartilages are soft and elastic. When they become ossified, however, or are in process of change,

they will be found hard, bony, and unyielding. By grasping the foot, just above the coronet, they may readily be felt. Though lameness is not always present, more or less stiffness and soreness is concomitant upon this disease. In shoeing for this disease, follow the directions given for a perfect foot. It will hardly be possible that the foot can be straightened and leveled completely until two or three shoeings. The shoe seen in Fig. 14 is to be applied, but the nailing is to be carried forward to the quarters instead of being at the heels. An application of cold water on the coronet will assist in the new growth of the horn.



Fig. 20.

A HOOF BADLY CONTRACTED, PREPARED IN THE COMMON WAY, IN WHICH THE BARS AND FROG ARE GREATLY REMOVED, THE HEELS OPENED, AND THE SOLE DEPRIVED OF ITS HARD SURFACE BY BURNING. (Compare with perfect hoof, Fig. 7.)

This is another of the morbid specimens, resulting from improper methods of preparing the foot and shoeing it. I have shown that the frog in a natural foot divides it into two equal parts, but in the present instance it is seen that the frog is no longer a right dividing line, almost two-thirds of the hoof being cast on one side. The foot has contracted badly, evidently by having the frog and bars cut away, and the foot hardened and dried in fitting the shoe hot. The spots indicated in the sole are the effects of burning. The frog shows signs of disease, and the inner spur was wasted entirely away.

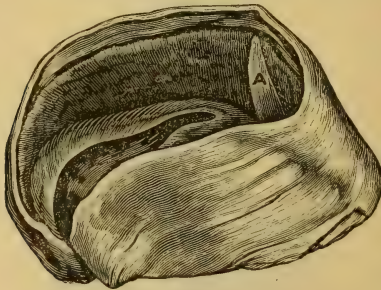


Fig. 21.

HOOF OF A DRAUGHT HORSE FROM WHICH FIG. 20 WAS DRAWN, SHOWING THE DESTRUCTIVE EFFECTS OF BURNING AND CLIPPING IN THE BADLY CONTRACTED HEELS, AND THE SPUR ON ITS INNER SURFACE.

A. Spur on the horny laminæ.

On the internal surface of the crust, at the toe, there was found the spur in the laminæ shown in the above figure, which extended from the inner sole up to the top

edge of the coronary, the coffin bone having wasted away in the front part, and the spur imbedding itself against it. From hardness and dryness in the growth of the hoof the crust had become very shallow from coronet to ground surface. Dress the foot as to make it conform as near as possible to Fig. 7, and follow the directions given for that purpose. It will be found impossible to straighten the foot at once, as the growth proceeds from the coronet. For draught horses, if toe and heel calks are required, use shoe, Fig. 14, and nail at the quarters. Relieve the pressure around the toe. File or rasp the outside crust in front from coronet to ground surface, as that will tend to release the internal structure from pressure. Apply the cold water, as recommended in laminitis, for the purpose of stimulating a new growth.

Contraction.

Contraction is almost always the result of improper shoeing and mismanagement of the foot. By paring the frog and destroying the bars, removing the sole and opening up the heel, the foot becomes dry and hard, from which contraction is inevitably superinduced. It may also be produced by a wound given to the foot in picking up a nail, etc., as well as by an overgrowth of horn at the heel, whereby the hoof loses its elastic properties, and becomes hard and dry. Horses so affected are more liable to stumble and cut themselves than would otherwise be the case. It is not difficult of cure when the proper method is observed in shoeing.

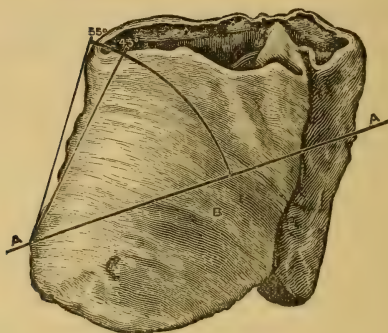


Fig. 22.

A, A. Line indicating the right ground surface of the foot, in order to give the foot its proper degree of obliquity.

B. Under or superfluous horn at toe and heel, which should have been removed.

This specimen represents the effects of contraction by having the crust grow too deep at the heel, wiring in until the bars and spur of the frog were raised to a level with the coronary band. The coffin bone was thus raised at the posterior part, and tilted or pressed forward against the front of the crust, bruising the sensitive laminæ, producing lameness in the toe.

In shoeing a foot of this description, open the heel and weaken it on both sides at the commissures, as thin as safety will permit; keep pressure off the toe; file or rasp the front part, to give greater freedom to the heel. The nails are to be driven, so as to take a low, short, thick hold and a steel shoe, as shown in Fig. 23, is

recommended to be used when the heels are much narrowed in. It will materially aid in their expansion.

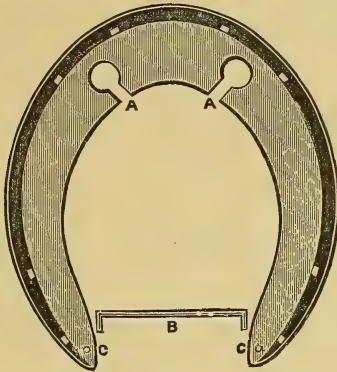


Fig. 23.

STEEL SHOE FOR CONTRACTED HEELS.

A, A. Mortises in the toe, by which the shoe is permitted to yield the required spring at the heels.

B. Key by which the heels are clasped until after it is nailed on the foot.

C, C. Holes or eyelets into which the key is inserted in the act of nailing.

It is necessary, before the shoe is applied, to spring it together at the extremities of the branches, fastening it in this way by means of the key being placed in the insertions of the shoe. After nailing, the key is to be withdrawn, when the shoe will spring back at the heel, and, gradually opening, will assist nature in the expansion of the foot. In many cases, the three-quarter shoe may be applied for one or two shoeings; though, if the

roads are hard, there may be danger in longer using this shoe, as it exposes the horse to the liability of footsoreness. Cold water may be used in preserving the hoof moist and flexible, thus assisting the new growth.

Thrush.

This disease is dependent on an inflammation in the sensitive frog, which, when it attacks the fore feet, is generally caused by a contraction of the crust at the quarters or heels. When the inflammation is resolved, it terminates in the discharge of a peculiarly offensive matter from the cleft of the horny frog, which part usually becomes soft and rotten, and the whole foot tender and sore. The discharge generally diminishes the inflammation, and may be considered as an effort of nature to cure the internal disease, thus preventing it from becoming so considerable as it otherwise would. When the discharge has existed for some time, by stopping it hastily we frequently produce inflammation and swelling of the legs. This only shows that it is necessary, in the first place, to remove the *cause* of the disease, since, if neglected, it sometimes extends to other parts of the foot, or degenerates into a more dangerous disease, called canker. With this view, in attempting to cure this disease, the toe is to be kept short and weakened in front from coronet to ground surface; and, in the application of the shoe, keep the pressure off the toe, to allow freer expansion at the heel, and the hoof kept as pliant as possible; if the heel be dry and inflexible, it is

well to free the expansion by weakening it, as much as can be safely borne, by paring a groove in the commissures from the heel to the point of the frog, as well as by opening up the heel and lowering it. When the frog is much pared away or shrunken, it will be advisable to apply a thin-heeled shoe or draw down to a three-quarter tip. If the horse flinches, however, or if the frog shows signs of soreness, it is a good practice to place a piece of leather between the back part of the shoe and the foot, it being nailed securely on with the shoe, and extending with the shoe well back on the heel, that too much pressure on the unsound parts may be avoided. When, by this method, we have succeeded in removing, in some measure, the compression and consequent inflammation of the sensitive frog, a dressing is sometimes required to subdue any inflammation that may exist, it is advisable to apply some dressing to the sore or cavity in the frog, which will render that part secure against any irritation which might arise from foreign particles of dirt and sand. The salve elsewhere described may be used on these occasions until the inflammation leaves the sensitive frog. With respect to those thrushes that attack the hind feet, independently of the above cause, they are mostly attributed to damp, nasty stables, or to animals standing in foul litter. The treatment required is the simple and easy one of avoiding the cause and keeping the feet clean.

Canker.

The canker is, I believe, a local disease, that frequently arises from a thrush, and most commonly attacks the front feet. It consists at first of an ulcerous sore in the frog, where the inflammation of the part is considerable, becoming very soft and rotten, with a discharge of purulent matter. The disease, by early attention, might be readily cured, but if it continues its ravages, it frequently destroys the horny frog, and extends to the sole and other parts of the foot, even to the coffin bone and laminated structure, when it is almost impossible to disperse the genuine canker.

Scratches

Is a disease which attacks the heels, consisting in an inflammation, swelling, and consequent chapping discharge of fœtid matter, most commonly occasioned either by inflammation in the foot, want of exercise, or by neglect in cleaning and drying the heels carefully. In cases of this kind, exercise is essentially necessary, to be assisted by a few applications of my foot salve and careful grooming. In inveterate cases, where the disease appears to have become habitual, the eruption is known as grease, and there will be more difficulty in its removal, though the same treatment, generous dieting, good grooming, and regular exercise will tend to recover it.

For sores like the preceding kinds, make applicatiions

of my foot salve. When the frog is diseased, saturate with it a piece of white cotton; press it into the opening in the cleft until it is well filled. The outer surface of the affected parts may be then given a slight coating, to protect the diseased portion from foreign particles of dirt.

Split Toe.

The horse's hoof which I touched upon in the beginning of this book is so constructed that any exertion may be best carried on by a given elasticity from the quarters quite to the point of the toe. Should the natural conditions of the foot be altered, however, by being deprived of sufficient moisture to preserve in it that degree of combined toughness and flexibility, the foot loses its power to yield to pressure and return, and when force sufficient to overcome its resistance is exerted, the hoof, no longer capable of springing to it, suddenly gives way by splitting.

This breakage occurs wherever the strain is the greatest:—at either of the sides from the quarters to the heel, or directly through the middle of the hoof in front.

The condition generally present, then, in the splitting of the horny hoof, is a hard, dry brittleness, and this may arise in a variety of causes. Hot fitting on of shoes, as well as clipping, high toes and heels on shoes which prevent the frog from coming in contact with the ground, high heels on foot or shoe, flat feet and long toes on draught horses, and the paring away of the frog, sole, bars, and heel, whereby the foot becomes contracted, are prolific sources for bringing the hoof into the above-mentioned state.

Any horse whose feet are thus placed is exposed to fracture either on their anterior or lateral surfaces. With these conditions toe-crack is produced by the foot acquiring an uneven ground surface, and being thrown into an unnatural or forced position. If the heel of the foot, through ignorance or neglect, is suffered to grow to an unusual height, the pressure and thrust of the coffin bone against the comparatively thin crust will almost surely result in fracturing it in front. A peculiar accident, to which horses are sometimes liable, will also produce the same result. When a horse, being shod with heel calkins, overreaches himself, that is treads on his hoof with another foot, and bruises the coronet or crust, the crease thus made oftentimes extends itself until the crust is entirely split.

Toe-cracks most generally attack the feet of heavy draught horses, doubtless owing to the coarse method of applying their shoes, as well as a greater stress being placed upon their toes than upon those of other horses in the exertions of drawing heavy loads.

In treating this disease, the first care must be to thoroughly cleanse the foot, after which the crack must be pared out smoothly, on either side, as deep as the horny substance extends, thus widening the crevice so as to prevent all friction between the separated parts of the wall. Pressure must be taken entirely off the toe, and a groove, as in the accompanying figure, should be cut into the bottom of the crust at the toe

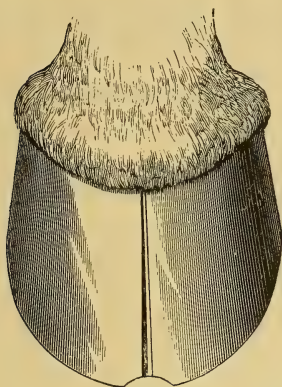


Fig. 24.

SHOWING THE HOOF PROPERLY DRESSED FOR SPLIT HOOF.

Having done this, if the foot be contracted at the heel, pare it to a level. The toe of the foot is then in turn to be shortened and the heel weakened by paring out the commissures between the bars and frog as much as, in the judgment of the farrier, the foot can safely bear. The pattern of shoe represented by Fig. 14, should be used upon horses intended for draughting purposes, the nails being placed from the front of the quarters back toward the heel. The toe calkin being placed well back from the toe lightens the stress at the point where its weakness is the greatest, and allows of an easier play to the foot when in motion. When the split occurs in the foot of a general business horse, lower the heel and shorten the toe, as much as safety will permit, and thin

the heel of the shoe to obtain strong frog-pressure, removing the pressure around the toe of the foot as before directed.

Quarter Cracks

are longitudinal fissures in the hoof, occurring near the heel. They are generally occasioned by improper shoeing, or neglect of the foot; or by allowing the horse to stand on hard floors for a length of time, or in the overgrowth of the crust; or when the frog, sole, and bars have been pared away, and the heels weakened; burning the foot in shoeing, or springing the shoe off at the heel, and throwing the weight of the horse onto the wings of the coffin bone—the hoof becoming dry and brittle—are some of the causes which produce a disposition in the hoof to contract, which, occurring at a time when it is dry and inflexible, results in its lesion or splitting. In speedy horses, where the heels are allowed to grow too high, the crust losing its elastic toughness, and becoming hard and thickened, there is a liability, by the repeated jar of alighting on his heels in violent action, to burst in the quarters—the break occurring where the stress falls heaviest, back of the heel, or at either or on both sides.

In paring a foot of this kind, reduce the crust, especially at the heel, as much as the safety of the foot will permit. The next object is to remove the contractile disposition in the hoof, by rasping it at the quarters until an appearance of serum, after which let the crack be opened on both sides, with a drawing knife, so that friction of the fractured parts may be avoided. Then rasp or

cut out the bottom of that quarter which is cracked, so that no part of it may bear upon the shoe. After the wall has been lowered, should the frog project below the bottom of the foot, pare it flat. By so doing, the frog will be aided in growing wider, and assist the foot in expanding. When the cracks occur well back at the heels, I sometimes find it necessary to protect the weak parts from the violence of concussion, by applying the bar shoe. Commence thinning the shoe at the center of the quarters, carrying it off both toward the heel and toward the toe, having the shoe light and the bar good and wide, to obtain strong frog pressure. When the cracks occur opposite the wings of the coffin bone, level the foot and shorten the toe as much as can be conveniently done. If the crack occurs on one side only, use the shoe shown by Fig. 25, allowing for strong frog pressure.

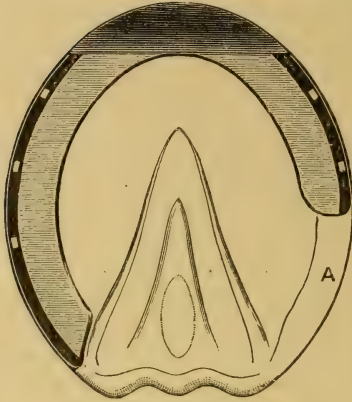


Fig. 25.

A HOOF PROPERLY SHOD FOR THE CURE OF A QUARTER CRACK, THE SHOE BEING WELL BEVELED AT THE TOE, AND CUT OFF IN THE BRANCH, FORWARD OF THE SEAT OF LAMENESS, AT A.

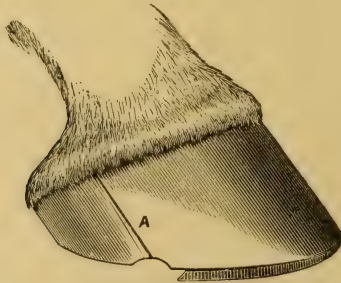


Fig. 26.

A SIDE VIEW OF THE FOOT, WITH CRACK OPPOSITE THE WINGS OF THE COFFIN BONE (A), PROPERLY DRESSED AND THE SHOE ADJUSTED, THE TOE BEING ROLLED OR BEVELED, AND THE HEEL PROPERLY CUT FOR THE BEARINGS AT THE QUARTER.

If the crack happen on both sides, shoe with a three-quarter tip. File or rasp the wall on both sides of the crack, from coronet to the ground surface, as thin as safety will permit. If toe and heel calkins are required, apply the four-calkin shoe, well rolled on the ground surface. If the foot be sore and tender, my foot salve may be used with advantage, by warming and saturating with it a pledgit of cotton, and applying it to the affected parts. The new growth may also be stimulated by keeping the hoof moist with cold-water bandages. Remove the shoes every three weeks, in order to prevent an excessive growth of horn. By following these instructions, this form of disease may be easily cured, and the horse regularly worked.

Corns.

There are several forms in which these troublesome growths manifest themselves, though their cause and location is generally the same.

The seat of corns is always in the sole of the foot, or its lower connection with the wall in the posterior portion of the hoof, at or in the angle made by the wall in its return to form the bars.

The primary cause of all corns in the horse's foot is an uneven ground surface, resulting either from the improper leveling of the foot by the farrier or its previous neglect. Let the foot always be pared level, and the shoe properly adjusted to the wall, and corns will find no abiding place in feet possessed of these conditions.

Hard corns are a fungoid growth upon the inner sole, at its junction with the horny laminae, and lie beneath, as well as at the side and rear of the foot bone. This substance bears some resemblance and is analogous to the corn of the human subject, being a thickened deposit of a kind of hard skin, and, from its crowding into the sensitive surfaces, the source of so much trouble and pain. The corn may be generated by severe contusions upon the inner sole, but it generally arises from a lateral compression of the horny hoof inward upon the sensitive parts.

The vertical pressure of the horse's weight upon the foot bone is oftentimes so severe, and its winged extremities are imposed down upon the underlying membrane and sensitive sole so suddenly and forcibly as to bruise them against the horny sole or shoe without. The bruise thus established develops the wet or sappy corn, which consists of an effusion of blood or serum into the pores of the horn, marking its location by leaving a stain upon the outer sole. When the stain appears dark, and is easily removed by paring away, the corn is old and working out, but when the stain appears bright and ruddy, by penetrating further into the horn, the corn is new, and needs attention. These corns may be aggravated by additional injury, and terminate in a more serious form, known as the suppurative, in which case the sensitiveness will be greatly increased, causing intense pain, and, as a necessary consequence, acute lameness, or finally resulting in laying the foundation for a quittor.

In preparing the foot for the shoe, if the horn should exhibit signs of moisture or discolorization, caused by the exudation of a sappy or wet corn, open the center of the part indicated, and gradually remove the sole, until the foreign matter is released. The foot must next be dressed down until it acquires a perfectly level basis. For draught horses, let the toe be shortened and the heels lowered; apply a shoe with toe and heel calkins, the toe calkin to be set well back from the front of the shoe, as seen in Fig. 14. Let the shoe rest easily on the heel and quarters as, by springing it off at the heel the friction between the foot and the shoe would have a tendency to irritate and bruise the sole: nail in the quarters and relieve the pressure at the toe. For horses of general business or road purposes, pare the foot as low down as safety will admit, shorten the toe, and cut the shoe off on the side in front of the corn, as seen in Figs. 25 and 26; but if the corn be established on both sides, shoe with a three-quarter tip, in order that the shoe may not come as far back as the affected parts. After such, apply my foot salve to the wound, as well as a cold water bandage to the coronet, and soon all soreness will have disappeared.

Navicular Disease.

The navicular bone, from its position in the center of the foot, and the important protection which it receives from the surrounding surfaces, is seldom visited by disease or disturbed by accident. It is protected at either end by the wall and cartilages, on its upper side by the

lower pastern bone, and beneath, where the greatest liability to accident rests, the sole, the outer and inner frogs, and the flexor tendon, guard it against injury.

Protected thus, it is almost an impossibility for it to become bruised or otherwise injured by any external influence; but should the frog and sole be cut thin or greatly pared away, and the horse sent pounding along over cobbled streets or uneven roads, the foot no longer affording adequate protection to the navicular bone, the sensitive frog and sole will become bruised, and inflammation and acute pain will then inevitably result.

In this disease the flexor tendon becomes ulcerated where it slides over the under face of the navicular bone, and the severe pain experienced is from the play of the tendon over the rough diseased portion of that bone. This disease, once contracted, is incurable: a great deal may be done, however, to ease the animal. Two-thirds of the cases of this malady, I believe, are caused by improperly dressing the foot, cutting the frog away, weakening the bars, and thinning the sole; and then, driving over uneven roads provoking inflammation in the tissues and membranes of the foot, which finally communicates itself to the bones and their attachments with one another.

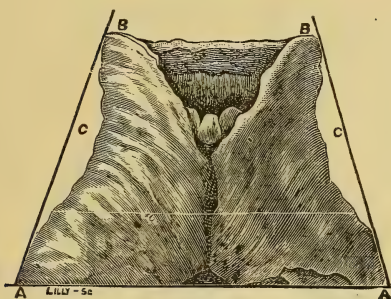


Fig. 27.

A HOOF, SHOWING THE EXTERNAL CHARACTER OF NAVICULAR DISEASE.

A, A. Base or ground line over the center of the quarters.

B, B. Upper edge of the coronet.

C, C. Falling in of the hoof opposite the seat of disease.

(The white line across the foot indicates the superfluous growth of the hoof, and the extent to which it should be reduced.)

The accompanying figure represents a back view of a hoof affected with the navicular disease, and shows the shrinkage of the outer wall upon the living parts of the foot immediately below the coronary band, crowding the cartilages in and stopping in a measure the circulation, the foot becoming dry and hard, and the wall thick and deep. The white line across the heel shows where the foot should be reduced to be placed on its proper angle.

In dressing the foot thus affected, pare it low as safety will permit, and file or rasp the outer wall from back of the quarters to the heel from coronet to the ground surface, weakening it until the appearance of serum, narrowing the foot on the ground surface, and thus relieving the pressure on the sensitive parts.

For shoeing a horse affected in this manner, a shoe such as is represented in Fig. 28 must be used.

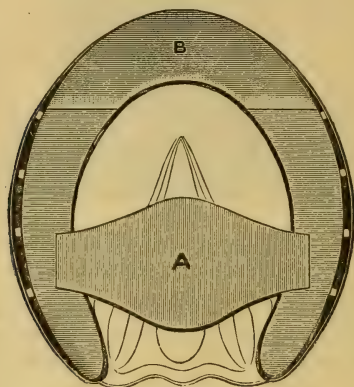


Fig. 28.

SHOE FOR NAVICULAR DISEASE, DESIGNED BY DR. G. W. BOWLER, V. S.

- A. Plate welded on the shoe over the seat of navicular disease.
- B. Roll or bevel at the toe.

I have used this shoe with satisfactory results. It can be easily made, being of the same thickness in both branches from the heel to the center of the quarters; in front of the quarters it is gradually thinned, and at the toe it is rolled, as indicated at B.

After the shoe is prepared for the foot, a thin plate of steel must be welded on level with the face of the shoe, as represented at A. The plate being placed directly over the seat of the disease, will protect the affected parts from any evil results of severe concussion. The

bar thus placed must not bear upon the frog, as frog pressure would have a tendency to aggravate the disease. An open space of considerable depth must be suffered to exist between the plate and the foot, sufficient to permit the removal of dirt, etc., which may secrete itself.

By having the shoe rolled in front of the quarters to the toe, the horse will get over the toe without much strain. The shoes should extend as well back at the heel as can be safely worn.

Raised Coronet.

This species of disease implies a violent alteration of the coronary band at the heel; consequent upon either side of the heel being uneven on the ground surface. This position of the hoof is fully shown in Fig. 29.

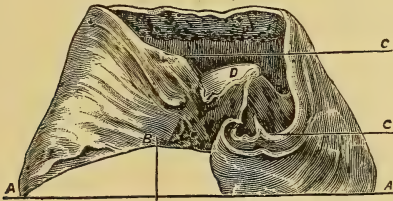


Fig. 29.

STATE OF A HOOF IN RAISED CORONET.

- A, A, Line of ground surface.
- B. Inferior edge of raised heel.
- C, C. Difference in height of the sides of the heel indicated at the coronet.
- D. Inner spur twisted and deformed.

This complaint arises from mismanagement of the foot,

and its continuance is owing to indifferent shoeing. In slight cases, when a horse is let run at grass without shoes, it will generally be found sufficient to effect a cure. In obstinate cases, however, or when the horse travels or works regularly, recourse must be had to a careful plan dressing the foot and shoeing it.

In such cases, in order to restore the foot to its natural healthy state, the mode of obtaining levels we have pointed out must be attended to. The lower part of the heel is then to be reduced, but the foot on this side must otherwise be carefully preserved, that it may be sufficiently firm to make up for the deficiency of the full heel. On the other hand, the raised or twisted side must be weakened as much as can be conveniently done, so that it will readily yield to pressure; the sole and bar being carefully thinned, gradually thinning the paring as the toe is approached. The shoe which is applied should be cut off on the side where the crust turns up, that that part may not be exposed to any pressure from it.

If the shoe is applied in the manner indicated, the nails being placed in the quarter of the low side, and stopped at the toe of the raised side, the crust on that side, it is observed, will be kept at a considerable distance from the ground.

The flexibility which the horn possesses, therefore, allowing it to yield in a small degree whenever the horse's weight is thrown upon it, gradually restores the foot to its natural condition, without the liability of further pain. Whenever the hoof appears to be too dry and

strong, or to have lost its pliancy, it may be kept moist by applying several folds of flannel round the coronet constantly wetted.

Defective Ankle Joints.

The catalogue of diseases, defects and deformities in the feet of horses have by this time, the reader will perceive, grown to a considerable length. In tracing them to their small beginnings, we find a striking instance of the serious results springing from apparently so trifling a cause as improper shoeing. The weakness peculiar to some horses in their hind ankle joint next suggests itself. This troublesome affection, in many cases, arises from the over-taxation of the upper pastern joints during colthood, and, again, from wearing shoes having high toes and heels, or from hereditary influences. This defect is found to be more prevalent among speedy horses and among horses having long shanks than those of any other kind. Horses so affected do not always go lame, though they are apt to be less sure footed, resulting from the extensor muscle being weakened and unable to prevent the ankle from knuckling when the horse elevates his foot. As fever and inflammation frequently are present, accompanied by an enlargement of the ankle-bandage, it will prove beneficial to bathe or bandage the parts with cold water. In slight cases, a blister may be of probable service; but, when of longer standing, the actual cautery will also be necessary. After such an operation, however, the horse should be permitted to

range in pasture for three or four months, until the soreness is gone and the ligaments strong again. A cure may be thus effected, but hard work may bring a relapse by having high toes and heels on the shoes.

In this way too, proper methods of shoeing may bring relief and sometimes effect a cure. These will not be uniformly successful, however, but they must be carefully employed that no impediment to speed may exist. In preparing the foot for the reception of a shoe applicable to the disease in question, it should be pared level, leaving the frog and bars intact, and having the toe shortened as well as can be safely borne. The form of shoe necessary to be recommended in this case is indicated in Fig. 30.

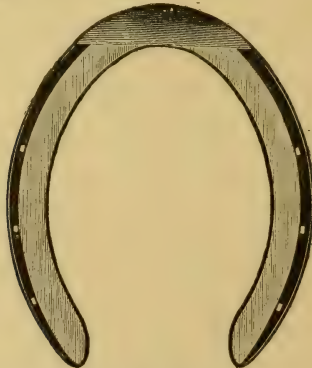


Fig. 30.

SHOE FOR KNUCKLING.

It should be made of steel and quite thin and light, in

order that the horse may have his foot as close to the ground as possible, as well as to receive the benefit of strong frog-pressure. The shoe must be plain, without calkins, and well beveled on the ground surface at the toe, that the foot may slide over without straining the parts affected.

The Knee Sprung Horse.

The exact cause of this disease has never been clearly made out, it generally appears as if the ligaments and bandages of the knee had become strained and enlarged, in which also the front and back sinews may become involved by over-exertion of those parts, when the bones of the knee-joint being no longer properly retained in their places, become bulged or sprung forward.

Young horses subjected to an excess of hard pulling before they are seasoned or matured, are most liable to injure their knees in this manner. Care should therefore be taken in working them that their limbs are not over-tasked while under the age of seven years.

Horses employed in constant "up hill" work, where the stress upon the knee is continued and severe, or by suffering them to stand in stalls where the fall is considerable and the floor hard, creating unnecessary exertion in the muscles of the leg, and keeping the ligaments constantly in a tense state, would expose them to a deformity in their knees, by their leaning or bowing out in consequence of the ligaments and tendons becoming weakened. When the proper angle of the foot is destroyed, as

is most usually produced by improper shoeing; such as having high toes and low heels, or sore heels, which cause a constant leaning forward on the knees to relieve the pressure; or should the foot even be properly pared, and the shoe then applied be thick at the toe or have high toe-calks—the heels being low—the effect of always ascending would be the same, and result in the malformation of which we treat.

When the disease becomes chronic, and the ligaments and tendons so much relaxed as to be no longer able to respond to the treatment, a radical cure may be impossible; but, if taken in time, and the foot properly dressed and shod, the disease can be cured.

In dressing for this disease, pare the foot level and lower it to its proper angle, having in mind the directions given under that head. The shoe should be narrow in the web and as light as can be safely worn, being also well concaved on the ground surface, and adjusted as far back at the heels as the safety of the foot may seem to require. A style of the scoop-toed shoe or the scoop-toed rolling-motion shoe (Figs. 40 and 46) should be used, though, if toe and heel calkins are necessary, use the four-calkin shoe (Fig. 45). Either of these patterns, by shortening the ground surface at the toe and strengthening the knee when the horse is moving forward, will relieve the strain and enable him the better to pass his feet over uneven ground surface, which is sometimes the cause of twisting and straining the already injured parts. Another means of furthering a cure, is to feed the horse

from the ground. This will have the effect of throwing the animal's weight more directly over his limbs, and thus assist nature, in a manner, to retrench the enlargement in the knee bandages.

Curb.

A curb consists in an inflammation and swelling of the posterior portion of the hock joint, accompanied with considerable heat and pain, and often by lameness. The cause of this is an accident resulting to the ligaments in and around the hock, and is produced by such exertions as prancing and leaping, and galloping over uneven ground surfaces, etc. The peculiar conformation of some horses renders them more likely to be attended by curbs than others; but, as it is always the result of over-taxation, which will not admit of much labor in the part, it should be remedied as soon as possible. When the soreness is considerable, nothing but blisters can do any good, and even these will be ineffectual, unless the horse is given a necessary amount of rest. Cold water is useful in dressing the parts, when inflammation is present. In a moderate state, a properly strong blister is generally sufficient to effect a cure; but, unless the swelling is completely removed, repeated blistering will be requisite. In extreme cases, it may be necessary to fire and blister the affected parts, in order to effect a permanent cure. After firing and blistering, a considerable time at rest will be necessary to strengthen the parts, before working them.

In getting the foot ready for the shoe, pare it low and level, and shorten up the toe as much as can be conveniently done. After such preparations, adjust the shoe represented in Fig. 45.

Spavin.

This disease takes its name from an enlargement of the inner side of the hock, and appears under two forms, which are denominated the bone and the blood or bog spavin. From whatever cause bone spavin may proceed, it consists in a bony exerescence about the hock joint, and generally occasions lameness. It can not be treated with uniform success, for it often proves very obstinate, and not infrequently incurable. By an early application of the proper remedies, however, I believe it will generally be removed. This complaint, in its incipient state, may be discovered by an unusual heat or tenderness on the hock joint, accompanied with a touch of lameness. At this period of the disease, a blister will generally prove successful; but, when of longer standing, and the swelling and lameness continue, it will be necessary to apply to the actual cautery. This operation, however, must never be performed while any inflammation remains. It will be advisable, also, to turn the horse loose, and let him enjoy this kind of rest for a considerable time. Should the swelling continue, notwithstanding these remedies have been carefully employed, the injury is obviously incurable.

Bog spavin is a dropsical condition of the joint, which

becomes so either from a loss of power in the *absorbent vessels*, or an increased action of the vessels which form the joint oil. Perhaps both these causes may concur in producing the disease, the more remote cause of which is generally hard work—that is, too great or too long continued motion of the joint.

The bog spavin does not so often occasion lameness as the other, except when a horse is worked hard, which generally causes a temporary lameness removable by rest; but it does not always admit of a radical cure, for though blistering is of likely service it generally returns with any considerable exertion. Much may be done, however, to assist the horse in his movements, by properly paring the foot, and suitably adjusting a shoe such as shown in Fig. 45.

Soreness of the flexor tendon.

As its name implies, this complaint is an injury to the back sinew, from the effects of over-taxation. Work-horses are liable to become so affected, though it occurs more frequently in the running and trotting horses, by reason of their immense strides, the force of which has a tendency—when prolonged to a certain extent—to cause the tendons to become swollen and inflamed.

For horses suffering with sore tendons, the four-calkin rolling-motion shoe will be found a successful remedy.

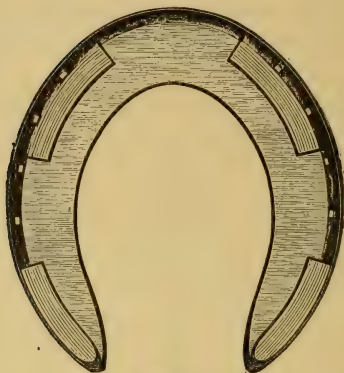


Fig. 31.

FOUR-CALKIN FRONT FOOT SHOE, TO BE USED FOR THE RELIEF OF SORENESS IN THE FLEXOR TENDON, OR CASES OF QUARTER CRACK, WHERE TOE AND HEEL CALKINS ARE REQUIRED, AS WELL AS FOR SORENESS AT THE TOE, AND FOR SPLIT FOOT IN FRONT.

The shoe should extend well back at the heels, the calkins being at least one-half inch higher at the heels than at the sides of the toe, where it should be well rolled on the ground surface, in order that the horse may be enabled to “get over” the toe of his foot with but little strain on the flexor tendon.

I have also found the scoop-toed rolling-motion shoe very successful in the cases of trotting and running-horses. The feet should always be well leveled and straightened, and the toes shortened as much as safety will permit. A preliminary application of bandages with cold water may be found beneficial.

CHAPTER V.

FORGING OR CLICKING.

We have to search for the real cause of the above affection in the disproportionate construction of the animal subject to it.

Upon examination, it will be found that the fourteenth dorsal vertebræ of the horse is, so to speak, the pivot upon which his weight is poised, being the axis or center of his gravitation. Horses, that forge, are unevenly balanced, and are heavier in the fore than in the hind quarters. It is noticed, too, in relation to horses of this description, that they are inclined to carry their heads downward, and, in proportion as the horse lowers his head, more weight is added to his front portion, and, naturally, the difficulty is augmented.

Such an affection is not only detrimental to the appearance of the horse, but it also is a probable source of injury to him, as well as of annoyance to his owner. To the farrier and to him alone belongs the province of remedying this difficulty. The foot must first be pared level, and the toe well shortened, observing in this proceeding the tact and judgment previously enjoined. This having been done, a light shoe is to be applied to each of the fore feet. The best weight for these shoes I have found to be about twelve ounces each. At the ground

surface of the toes the shoes should be beveled or rolled, and at the heels they should be shortened, for the purpose of covering as little ground surface as may be. The action in front will thereby be quickened. In treating the hind feet, they are, as in the case of the fore feet, to be pared level and straight. The shoes, however, should each be at least five ounces heavier than those of the front ones. They should also be made so as to extend three-fourths of an inch longer at heels than the foot, and turned slightly outward, and raised with heel calkins, as shown by Fig. 32.

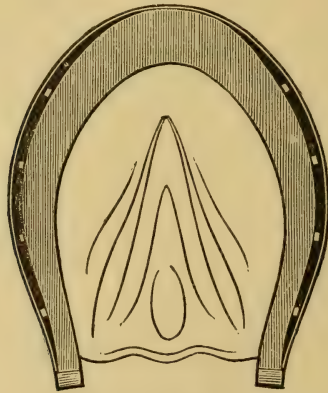


Fig. 32.

HIND FOOT SHOE FOR FORGING OR CLICKING.

The effect of such a shoe will be to retard the action of the flexor tendon, in lifting the foot by means of the branches being carried beyond the foot and raised with

heel calkins. Meanwhile, the fore feet, being correspondingly increased in their action, all danger of the horse forging or clicking is obviated or overcome.

Speedy cutting.

THIS is caused by the horse being unevenly balanced. Having more propelling power behind than in front—that is, the front feet not being able to get out of the way of the hind legs as they pass, the outside of the front foot strikes and wounds the inside of the shin bone in the hind leg, frequently causing much pain and soreness. It is termed speedy cutting, from happening while the horse is in rapid motion, such as the trot or gallop. To overcome this defect, it is necessary to equalize the different actions of the parts by quickening that of the front, and slowing that of the hind. This can only be done in shoeing; shorten the toe of the front foot as much as safety will permit, examine the feet as well as the splint bones, for, if soreness is present, it would have a tendency to retard the action in front. And then apply the scoop-toed rolling-motion or the plain rolling-motion shoe, which, being rolled in front, will assist the horse in getting over the toe of the foot quickly, and thus go out of the way of the other parts. In dressing the hind feet, lower the heels as much as safety will permit, keeping the front part of the toe at the natural angle, so as to have all the ground surface possible. Apply the shoe as seen in Fig. 38. By placing long heel calkings at the sides of the heels, or allowing the

shoe to extend at least one-half inch longer than the heel of the foot, the down action of the flexor tendon will be lessened, and, in a relative degree, the quick up action of the foot will also be lessened; also, the weight of the shoes to be worn must be determined accurately by the driver or proprietor.

Running horses are more liable to obtain speedy cuts than trotting horses; this is occasioned principally by the carrying of weight upon their backs, the weight being placed more directly on their front legs than on their hind ones. In plating running horses to overcome this difficulty, level and straighten the front feet, having the heels and frog of an even bearing when the feet are placed on the ground; shoe with thin three-quarter tips, beveling the *outside* of the plate from the ground to the sole-bearing surface, so as to obviate the possibility of the leg being cut by the shoe in passing. The punishment of speedy cutting is oftentimes so severe that the race is lost by the horse being unable to withstand it without his speed being retarded more or less.

Ankle, shin, and knee cutting.

IN ankle or shin cutting, it will generally be observed that the foot is tilted inward. Cutting often depends on weakness or leg weariness, and is liable to happen to horses when driven long distances or when they are carrying heavy shoes. Contraction and, also, soreness in the splint bone will cause a horse to cut, which almost always is the result of improper shoeing and bad man-

agement of the feet. All can be stopped by properly leveling and balancing the foot, and the appliance of a suitable shoe. When the position of the foot is faulty, it must be obvious that the remedy consists in altering its improper position, and straightening it, as much as can be, according to the instructions on page 39.

When the toe is the part which inflicts the wound shoe with a diamond-pointed shoe, removing the outer wall on both sides of the toe, so as to keep the foot perfectly balanced.

If the cut is given at the quarter, apply a thin, narrow, webbed shoe cut off at the inside toe-nail, the wall being lowered and the nail holes being punched straight inclining the nails to grasp a low, short, thick hold to avoid cramping the foot; small nails should always be used and care taken that light shoes are used, as a horse is then much less liable to interfere.

When a horse cuts his knees it is advisable to pay particular attention to the position of the fore feet to ascertain what part of the hoof comes into contact. If the foot toes out, the quarter will hit the opposite knee. In the same manner as in the treatment for ankle hitting, the first step must be to get the foot into its natural shape. When the quarter inflicts the wound, it should be rasped away equally to maintain the proper balance of the foot; if the outside can not be taken off enough, the shoe should be full to the inside toe. Shoe with as light a shoe as can be safely employed, and strive to obtain strong frog-pressure. If the horse be observed to

hit under the cap of the knee, increase the weight of the shoe; the additional momentum thus acquired in the motion of the foot will carry it over the point of contact; but if the interference be over the knee-cap, alter the style of going, by proportionately reducing the weight of the shoe. If the horse hits with the toe, shoe with a diamond-pointed shoe, and preserve the poise of the foot.

Ankle cutting behind is caused by the improper balancing of the foot, which must be leveled and straightened. If the horse cuts with the toe, apply the shoe shown in Fig. 35. The long calkins at the toe and heel will serve as a brace to keep the foot from tilting in. If he cuts with either heel or quarters, cut the shoe off at the inside toe, and shoe light. The same styles of shoes will serve in almost all cases of ankle, shin, or knee hitting; but it not unfrequently happens, however, that cases of interference are so confirmed that they stubbornly resist all efforts of the smith. Under the above treatment, at such times, special kinds of shoes will be necessary.

Elbow and Arm Cutting.

When a horse has too much freedom in the action of the knee of his fore leg, which causes it to bend under him, when lifted, in such a manner as to strike and bruise the limb, it is called elbow or arm cutting. To overcome this difficulty, the heel of the foot should be pared as low as it can be safely done. The toe, on the con-

trary, should be left long. The shoe should be light, for the lighter the shoe the less liability there is of the elbow or arm being cut. The web of the shoe should be narrow, especially from the quarters to the toe. The shoe should be well concaved on its ground surface, from the heel to the toe, particularly so in the case of horses who cut or hit the arm or elbow with the heel. (It may here be observed that the greater number of horses cut their elbows with the toe.)

In some instances, the above method will not produce the desired effect. It may then be augmented by a rubber pad, made to fit the sole of the foot so as to completely cover it. The method of doing this is displayed in the annexed drawing. The thickness of this pad is to be determined by the thickness of the shoe, so that, when adjusted, it may be even with the ground surface of the shoe.

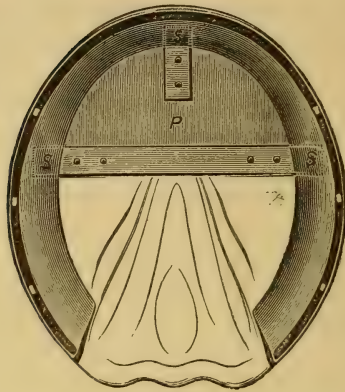


Fig. 33.

SHOE PREPARED TO DESTROY THE EFFECTS OF ARM CUTTING.

P. The rubber pad, adjusted on the inside edge of shoe.

S, S. The steel slats retaining the pad in its position beneath the shoe.

Let the slats (S, S) be about the thickness of ordinary hoop-iron, five-eighths of an inch in width, or thereabout, and of sufficient length to extend across the foot in front of the frog. Another, similarly made, is to be adjusted to the toe. These slats are to be riveted to the rubber, after which, when the pad is applied, the ends of the slats will find for themselves a hold between the shoe and the sole. For convenience, a groove may be cut into the rubber, and a slight notch made into the outer wall of the foot, for the reception of the slat—the plain surface of the pad being exposed. In this fashion it may be adjusted and removed at pleasure. Its pur-

pose will be to break the force of the blow, when the horse is in motion, and prevent its cutting or bruising the elbow.

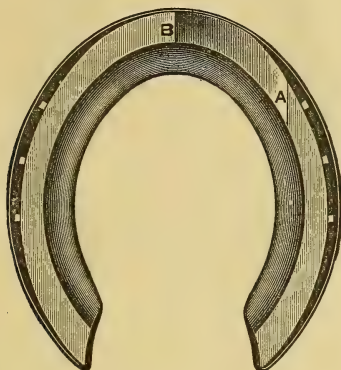


Fig. 34.

FRONT FOOT SHOE, FOR EXTREME BAD CASES OF ANKLE, SHIN, OR KNEE HITTING.

I have used a style, such as I here give, in the treatment of the severest cases of ankle and knee cutting, with admirable success. The inside rim of the shoe is beveled inwardly to a thin feather edge, beginning at the center of the toe marked B, and extending around its outside branch to the quarter at A; the shoe from the center of the web is beveled outwardly. The effect of this will be that when the foot is in the act of springing from the ground, the bevel at the toe will force it to go over in an oblique and outward direction, thus passing the ankle or shin without bruising or cutting it.

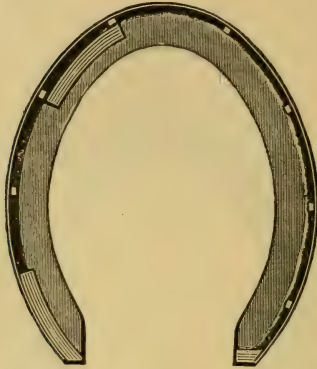


Fig. 35.

HIND FOOT SHOE FOR ANKLE HITTING.

The foregoing observations are in reference to the treatment of either fore or hind feet. The hind feet, however, being different in their shape, as well as action, require a separate form of shoe for cases of extreme stubbornness. In Fig. 35 is an illustration of a shoe intended for feet of that description, having a long calkin at the heel of the inside branch, and a calkin attached to the inside curve of the toe. This shoe will effectually prevent any thing like an inward dip of the foot, and thus render ankle cutting an impossibility or a matter of great difficulty, in cases where the horse hits with the quarter or heel shoe with a three-quarter shoe, the same as directed for front feet.

CHAPTER VI.

GAITING YOUNG HORSES.

It is oftentimes observed that the action of young horses, after having been broken to work, is disproportionate, the propelling power of their hind legs being in excess of that in the front ones. In order to overcome this difficulty, and regulate their movements equally, the following method is to be observed: The feet must be leveled and straightened, and the toes of the front feet dressed up close and short. If the front action is then to be accelerated, very light shoes, well rolled on the ground surface, and shortened, to avoid unnecessary friction, are to be resorted to. The hind feet should also be shod light, but long in the heels; the heels turned outward, and calked lengthwise, as shown in Fig. 38. Fit the shoes closely to the wall around both sides of the heel, and carry them over at the heels, at least one-half of an inch longer than the foot—the calks to be about one-fourth of an inch high.

In consequence of these long and calked heels, the quick flexing and raising of the foot is, to a certain extent, reduced, while the rolling motion of the shoes having the effect of quickening the action in the front feet, the movements of both will thus be balanced and equalized. In case a light shoe should fail in producing

these results, heavier shoes should be used on the hind feet. These should be from four to five ounces heavier than the forward ones.

In former years, it was a cruel practice among horse-men, in order to shorten and quicken the stride of young horses, to drive them over hard roads, until they became sore, when, as a natural consequence, their action would become shorter and quicker. It was desirable that a more humane course be pursued, if possible, in this matter, and I sought to find in a proper method of shoeing the means necessary to accomplish the desired effect. I aim to get the horse over his toe, quickly, which, of course, forces him into a more rapid stride, and this is done by shortening up both front and hind feet as much as can be conveniently done, and the use of a light rolling-motion shoe, both in front and behind. If the action is balanced, the shoes may be of the same weight all round.

Balancing the action of horses.

One of the greatest difficulties I have had to contend with, has been the balancing of the action of the trotting horse. Since the requirements of each animal are so varied, various methods had to be observed in the treatment of them. Some being long, low striders, and some high, short striders; some requiring heavy shoes, and some light shoes; some bar shoes, and some open shoes; some concave shoes on the ground surface; some flat shoes; others rolling-motion shoes, to quicken the action in front; some toe-weight shoes, to lengthen the

stride; some long toes, and others short toes. When the action of a horse in front is short, high, and quick, it will generally be found that the toe of the foot is too short. This can be remedied by lowering the heels as much as possible, which will give the foot more to the ground. In case the front part of the foot has been filed or rasped too short the shoe should be extended over and beyond the toe, and thus acquire a proper extent of ground surface. The weight of the shoe must be determined by the driver or owner as to what is best adapted for the horse to carry with ease and safety.

When the action in front is long and low and stiff-kneed, shorten the front part of the foot as much as possible. Use the toe-weight shoe—a style of which is shown in Fig. 47—being well rolled on the ground surface in front of the quarters to the toe.

The effects of this shoe will be to allow the horse a quickening of the step in motion, imparting, as it were, a “down-hill” effect, which, while the weight, being greatest at the toe, will necessarily extend the stride. In proportion, then, as the knee action is to be increased, the roll in the shoe is likewise to be increased. Great care must at all times be exercised in leveling and straightening the foot, according to the directions given for that purpose.

One of the primary causes in the bad action of horses, when driven up to their best speed, is a soreness in the foot, caused by improper shoeing. An unlevel bearing will, as I have elsewhere shown, twist the foot and im-

pair the action of the laminae, or by corn bruises, or by under-punching and nailing around the toe, cramping the foot and soreing it, by pressure on the sole, or by paring the sole thin, and then shoeing with light, thin shoes, causing what is termed "foot-scald," or by burning the foot, causing it to become hard and dry. Another is by having high heels and short toes, or by destroying the proper angle of the foot, by having high toes and low heels.

In dressing the foot for the reception of the shoe, Fig. 7 will at all times be a guide, unless the foot becomes diseased, and nature will then have to be assisted in restoring the foot to its normal condition by other means.

Much good judgment is required in shoeing the hind feet of the trotting horse, as some have more action in those parts than in front. In this latter case, we must quicken the action of the fore and retard the action of the hind feet, and this can only be done by shoeing. By shortening the toes of the front feet, and shoeing with the scoop-toed rolling-motion shoe, the effect of this will be to lessen the ground surface—permitting the horse to get over the toe quickly—and thus get out of the way of the hind feet. In shoeing the hind feet, apply the shoe represented in Fig. 38, with the shoe projecting at least one-half inch beyond the heel of the foot. The usage of this shoe will be to destroy a certain portion of the down action of the flexor tendon, and thus overcome, in a proportionate degree, the quick flexing of the foot. The weight of the

shoe must be judged of, according to the necessities of the case, some horses requiring more weight behind than others, so that their action may be properly balanced. A horse with a low action behind can not carry much weight attached to his feet, as it would be tiresome for him. The labor being performed by the stifle and hip, the hock scarcely bending, the shoe should therefore be as light as safety of the foot will permit, being well concaved on the ground surface, without heel calkins. Another class of trotting horses, when in violent action, will sometimes carry one or both of their hind feet between their front feet, producing what is known as forging or clicking, and causing them to leave their trot and break and run, evidently from the effects of fright. On close examination, the defect will be found in the formation of the animal. Their stifle generally sets straight, and the toes of their hind feet are inclined in. The only way to overcome this difficulty is to quicken the action in front. For this purpose, the scoop-toe rolling-motion shoe should be used, being beveled on the inside and the outside of shoe, from the ground surface to the foot-bearing surface, concaving the shoe on the ground surface, in order that the hind foot may not strike under the toe, when the foot is lifted. By shortening the toe of the front foot, it will be assisted in getting over easily, and thus pass out of the way of the hind members. The shoe on the front feet should be short, so as to have as little ground surface as possible.

In paring and dressing the hind feet, lower the heels

as low as safety will permit, carefully preserving the natural angle.

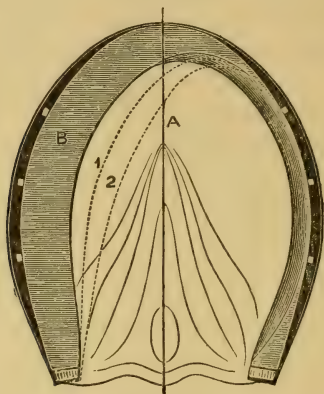


Fig. 36.

SIDE WEIGHT SHOE, FOR WIDENING THE ACTION BEHIND.

A. The line dividing the foot, showing the weight of the shoe, cast from the center outward.

B. The outside or weighted branch—Figs. 1 and 2, pointing to the degrees that weight may be added in the web.

When the shoe requires additional weight to carry the foot out, increase the weight in the web of the shoe to Fig. 1, and if more weight then is required, increase the web toward Fig. 2. If that does not carry the foot out sufficiently, cut off the inside branch of the shoe in front of the first toe nail, punch two nails on the inside arm of the branch, and bevel the shoe on the ground surface, around the inside toe. In case the inside branch of the shoe is cut off, lower the outside of the foot as much as the thickness

of the shoe requires, to make both sides of the foot level from coronet to ground surface. If the above instructions are observed, this style of shoe will not fail to produce the desired alteration in the style of the animal's going.

Another class of trotting horses is troubled by passing one hind foot between the front feet in traveling. On examining the stifle and position of the feet when placed on the ground, if the stifle stands out and the toes turn out, the action of this horse must be wide; it can not be otherwise, as, in springing from the ground, the natural sweep of the limb will carry the hind members past the fore ones, without touching them.

There are cases, frequently occurring, where an imperfect action can not be remedied by any kind of shoeing; but, if we closely investigate the matter, we shall find that it originates from some other cause. This is sometimes the case, when caries of the teeth is present, and the animal suffering from a continued toothache, inclines to lug on the bit to one side, and in such a manner that he becomes tangled in his gait and bad in his action. If he pulls his head and neck out of the line with his body, either to the right or left, the hind foot on that side is forced to land between the front feet and legs. At other times, it arises solely from the driver's lugging heavily on one rein, whereby the animal is thrown out of his regular balance, causing his breaking and shying, frequently making him unpleasant and unsafe to drive.

The teeth must therefore be properly treated to obviate these difficulties.

I have had Dr. R. E. Clark, the celebrated veterinary dentist, of New York, operate for me, on many occasions, and with wonderful success.

CHAPTER VII.

THE MULE.

As this "drudge of all servants" is of a different variety of the same species as the horse, his foot also partakes of the difference. Upon examining it, we find that in front the mule's foot is round and full. From the quarters to the heels, however, the difference in its shape appears. Instead of inclining at an angle equal with the face—as is the case in the horse's hoof at the heels—it is nearly perpendicular.

Care must be taken that the foot does not grow too long or too high at the heels or toe, as the outer frog would thus be prevented from touching the ground. The tendency then would be for the hoof to contract on its ground surface. I have seen the walls at the heels come together, from coronet to ground surface, until the foot was hardly more than half its natural diameter. The heels overlapping each other, had crowded the bars and frog up out of sight, raising the inner spur and bars as high as the coronary band. As the crowding of the bars thus necessitated a displacement of the internal structure, the coffin bone being raised behind, the weight presses it forward against the laminæ. The laminæ in this part being overtasked, soreness and finally lameness ensues.

In many instances, the mule is treated for lameness or strains, when the proper remedy was to have had his feet properly dressed and suitably shod. Do not permit the heels to grow to an extreme height; pare them down as much as can be safely done, and reset the shoes every three or four weeks; leave the frog and bars untouched and the heels unopened.



Fig. 37.
MULE SHOE.

In shoeing the mule for draughting purposes, toe and heel calkins will be required. In such cases, have them low, and of the same height, that the foot may be kept as close to the ground as possible, and the animal will travel with more ease and safety. Let the shoes be adjusted in a manner so as to fit the wall; and to avoid the possibility of cramping the foot, use small nails, with the nail holes straight punched.

CHAPTER VIII.

SHOES USED FOR SPECIFIC PURPOSES.

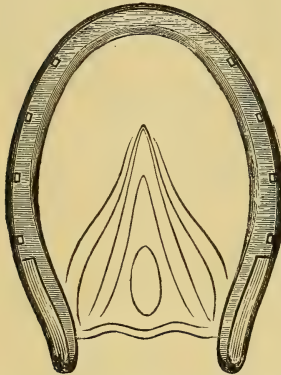


Fig. 38.

HIND FOOT SHOE TO BALANCE AND SLOW THE ACTION OF THE TROTTING HORSE.

This shoe should fit snugly on the foot up to both sides of the frog, the heels inclining outward. The shoe being longer at the heels than the foot, destroys the down action of the flexor tendon, which serves to lessen the quick up action. The length at the heels also gives more ground surface to the foot, which requires a longer interval for the horse to get over his toe. I have used this shoe with satisfactory results.

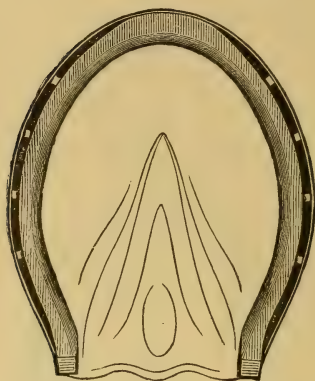


Fig. 39.

HIND FOOT SHOE FOR TRACK AND ROAD HORSES.

This shoe is made of steel, and is well-concaved on the ground surface. If the horse is a long strider, turn up small heel calkins so as to serve as a check to the foot in landing ; if a short strider, heel calkins are not required. Fit the shoe the same length as the foot, as shown in this figure, so as not to retard the down action of the flexor tendon. By following the above directions the speed of the horse will not be retarded.

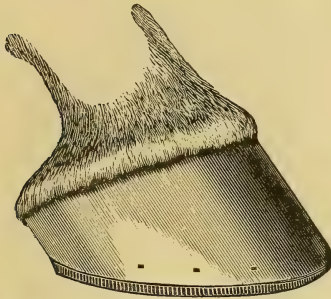


Fig. 40.

SHOE SHOWN ON THE FOOT, THE TOE AND HEEL AT A PROPER ANGLE OF 55° .

This style is known as the scoop-toed rolling-motion shoe, and is used to quicken the action of the horse in front, showing the length of the shoe at the heel and the roll at the toe, with the nails driven in the quarters.



Fig. 41.

IMPROVED CENTENNIAL SHOE.

This shoe is made of steel and is well concaved on the ground surface. The bars are made so as to fit upon the bars of the foot, and bear weight as the unshod hoof does in a state of nature, preventing bruises in the heels and quarter cracks. I have tested this shoe on horses that were quite sore and lame, the shoe being made of cast steel, the bars being sprung down from the heel to their points on the ground surface about one-half inch; this will soften and mellow the jar. The shoe, being well tempered, will allow the bars to spring with the horse's weight, and will be found one of the best devices possible to soften and relieve the effects of concussion when the horse is tender of foot, as well as to quicken the action in trotting, leaving the frog free and unim-

peded to perform its important functions of cushioning the foot and shielding the sensitive parts from injury.

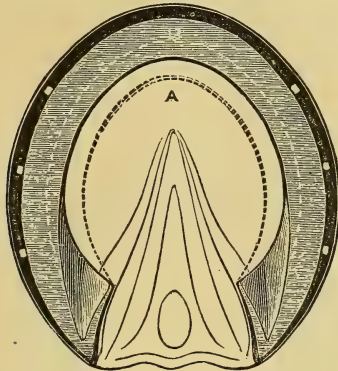


Fig. 42.

MODIFIED FORM OF CENTENNIAL SHOE.

This is a modified form of the shoe preceding, and is more easily made, yet embraces the same principle of bar-pressure. It can be made from any ordinary flat shoe, the wings to be swedged out solidly by means of a blunt, round, fullering tool, until they extend over the bars. This style of shoe I consider to be of especial advantage to recover the wiring in of the crust at the heels. By following the wall close up to the sides of the frog, it obtains strong bar-pressure, and gives the frog free access to the ground. If the sole of the foot evinces a tendency to be flat and tender, it is quite necessary to protect it from injury until it becomes strong. The only

way in which this can be done is by adding to the web in the shoe. The dotted lines around the inside of the shoe, at "A," indicate the increase to be made in the web for extreme cases of tender soles. As the sole gradually renews itself and becomes thicker, reduce the width of the shoe. In two or three shoeings, the foot will become strong, when the narrow-webbed shoe may be resorted to.

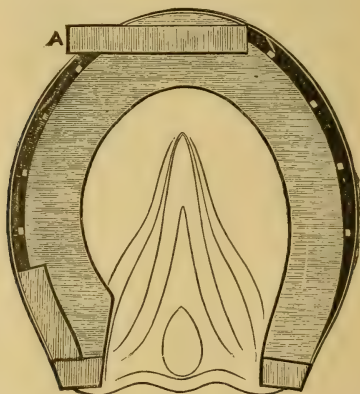


Fig. 43.

SHOE FOR DRAUGHT HORSE.

A. Outside toe.

This shoe is intended for draught horses. If the horse pulls from the outside toe, the outside quarter and heel will wire in. To overcome this tendency, I designed this style of shoe. Any ordinary shoe may be used, on which the toe-piece at "A" may be welded, which should extend over the outside rim of the shoe, say from one-

half inch to an inch. Stave up the outside heel of the shoe sufficiently to get good broad covering for the narrowed in heel and quarter. Use the round fullering tool to swedge the shoe wide enough to obtain good bar pressure. Turn up heels, and weld a calk on the outside heel, and fit the shoe snug to the wall up to both sides of the frog.

The effect of the projecting toe-piece is to brace or stay the weak part of the ankle and foot, and in two or three shoeings the foot will become natural in its movements, and fairly returned to its normal state.



Fig. 44.

HIND FOOT SHOE, TO PREVENT BRUISING OR CALKIN THE CORONET OF THE HIND FOOT.

A. Inside branch showing the heel calking.

This is often done by horses treading on the coronet with either or both heels of their shoes when standing in

the stall, cutting and bruising it, and oftentimes producing serious lameness. When toe and heel calkins are required, apply this shoe.

The inside heel calkin is welded lengthwise on the shoe, and set back from the heel fully an inch, the ground surface being beveled to a thin edge. If both heel calkins are placed on the coronet, weld a side heel on each side of the shoe, beveling the heels as before. By so doing, all danger of cutting or bruising the coronet is overcome. If plain shoes are used, bevel the heels on the ground surface, and shoe short.

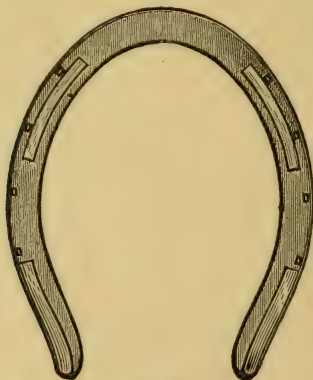


Fig. 45.

HIND FOOT SHOE, DESIGNED FOR CURB, SPAVIN AND SORE TENDONS.

This shoe is made as light as can be conveniently worn, and extends well back at the heel, the calkins behind being slightly higher than the front toe calks. The shoe,

being well rolled on the ground surface, will allow the horse in his forward movement to get over the toe with but little strain on the affected parts. I have used this style of shoe with admirable success.

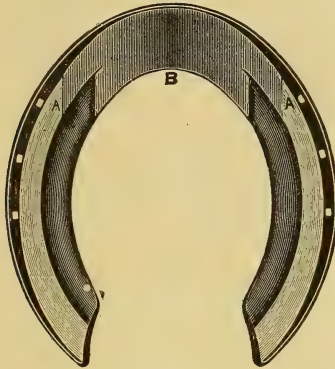


Fig. 46.

FRONT VIEW OF THE SCOOP-TOED ROLLING-MOTION SHOE.

- A, A. Commencement of the scoop on each side of the toe.
 B. The center, where the scoop is greatest.

This shoe can be readily made. It begins to be gradually thinned on the face, at A, A, until the center, at B, is reached, where, on its inner edge, it should be not more than two-thirds its original thickness, dipping deeper outward toward the toe, where it should be quite thin. The effect of this will be to lessen the ground surface of the foot, and quicken the action of the fore legs. This shoe will also be found beneficial for horses sore in the toes and cords of the legs.



Fig. 47.

FRONT FOOT SHOE, FOR BALANCING AND SQUARING THE ACTION AND GAIT OF HORSES, WHEN INCLINED TO RACK OR PACE AND SHUFFLE.

By shoeing with this style of shoe, the weight being principally in the toe, at the extreme length of the muscles, the action will be squared and balanced, if properly made and applied. In order that the shoe may have the desired effect, the quarters must be well concaved from the ground surface. In proportion, then, as the weight is lessened in the quarters, the toe of the shoe will be relatively heavier. This shoe can be used to quicken the horse's action, by being rolled on the ground surface. I have used it with the most satisfactory results.

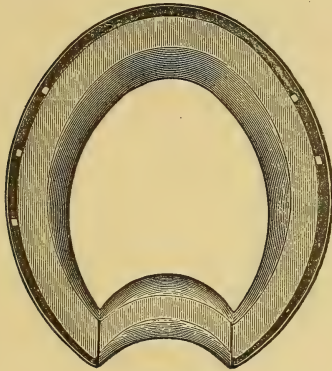


Fig. 48.

FRONT FOOT SHOE, KNOWN AS THE "GOLDSMITH MAID BAR SHOE."

This is applicable for a number of diseases of the foot, such as weak and bruised heels, quarter cracks, etc. It is also used extensively among trotting horses, the shoes being reduced down so light, they serve to keep the shoe from spreading on the foot, when the horse is in violent action. By having the bar set down below the face of the shoe, it serves the same purpose as an open shoe. This style of shoe is quite beneficial for long-striding horses, as they land mostly on the heels, and by having the shoe thinned well back at the heel, it will prevent the foot from becoming bruised. Bar shoes may not be used, except in violent exercise. I believe an occasional change to the open shoe would be beneficial in giving the foot more active use of the frog.

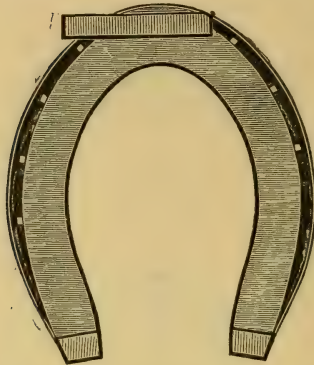


Fig. 49.

HIND FOOT SHOE, FOR HORSES REQUIRING TOE AND HEEL CALKINS.

A great many horses are in the habit of twisting their feet when lifting them from the ground, which makes them liable to interfere and strain their ankles or foot joints. Some will twist their foot in; others will twist it out. By applying the shoe seen in the diagram, if the twist of the foot is in, let the toe project over the outside; if *vice versa*, change the projection of the toe to the inside. This style of shoe will prevent the twisting of the foot, and enable the horse to get straight over the foot in front.

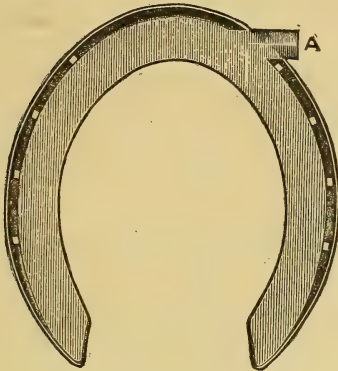


Fig. 50.

FRONT FOOT SHOE, TO PREVENT PADDLING.

A. The outside projection on the toe.

This defect most usually occurs in young horses. When taken up and broken to harness, some are very awkward, and acquire the habit known to horsemen as “padding,” in picking up their feet when in motion, inclining their front feet outward. This movement is awkward, and retards the animal’s speed. By applying the shoe in the annexed figure, their feet will be prevented from twisting when being lifted from the ground, and made to go straight over at the toe, and thus padding will be prevented. I have found this shoe useful in stopping ankle and shin tapping—which generally causes splints. This shoe is easily and quickly made by taking a piece of iron the same thickness as the shoe, and welding it on the outside of the toe, as seen at A in the cut.

MIXTURE FOR FOOT SALVE.

Shoemakers' wax.....	$\frac{1}{2}$ lb.
Beeswax	$\frac{1}{2}$ lb.
Mutton tallow.....	$\frac{1}{4}$ lb.

To be melted over a gentle fire, and warmed previous to any application.

Adapted for the treatment of thrush, canker, scratches, quarter crack, and for all sores and wounds in the foot.

Whenever the foot is wounded by a nail, it is necessary immediately to open, by means of a drawing-knife, the orifice in the horny matter, as deep as the wound extends, that it may heal from the bottom. The salve should then be poured into the wound until the cavity is filled, the foot being held in such a manner that the salve may cool and a quantity remain there, the stimulus of which will soon bring on a healthy growth.

APPENDIX.

OBSERVATIONS ON THE TRAINING AND RESPONSIBILITIES OF FARRIERS.

I can conceive nothing more painful to a humane and thoughtful mind than the intense, long-continued, and helpless suffering that the unskillful or careless farrier so often inflicts on man's patient, mute, and, therefore, uncomplaining friend, the horse, by sending a nail tearing through the keenly sensitive nerves of his foot, and in so many other ways, that a perusal of the foregoing pages will enable one to understand. A human being with a nail in his foot can go to a physician, or at least can make the trouble known, and have something done to relieve the pain. If a gravel-stone, or other hard substance, gets into his shoe, he can remove it. If the shoe pinches, or otherwise hurts, it can be laid aside, and the foot rested, or another shoe put on in its place. Now, suppose that, without the power of speech, without the ability to remove this shoe, some other being would thus injure a man's foot, would force on a shoe too tight, or otherwise badly fitting and hurtful, and should so fasten it that it could not be removed, what suffering he would endure, what sympathy would be aroused for him, what efforts would be made for his relief, what laws would be passed and enforced to prevent and punish such inhumanity!

But the sufferings of the poor animal, whose services are so closely connected with the toils, the pleasures, even the development of our race, are seldom even thought of. Indeed, a majority of persons seem to think that a horse's foot is only a hard, horny mass, without capacity for pain or feeling, that may be hacked, pared, burned, nailed, and mutilated at will by any apprentice or other person who chuses to claim ability enough to fasten a piece of iron to what he seems to consider as a mere piece of inanimate matter. This is a great mistake. The horse's foot is a beautiful structure, highly organized, containing nerves, blood-vessels, delicate joints, and other organs and mechanism, whose arrangement, plan, and purpose should be, *at least in part*, known by the farrier, and he is not fit for his work if he does not know something of this. And if he will not voluntarily study and learn this, he should be *compelled* to do so, or be forbidden to ply his pretended trade. A certain amount of professional training and knowledge should be made necessary, and compulsory, by the legislatures of every state in the Union; nay, by every law-making power of the world. Why should not schools for the training and education of farriers be established, and a diploma, or the certificate of some competent examining board, as evidence of a certain amount of knowledge of the subject, be required, before a farrier should be allowed to practice on the living, innocent, helpless animal? And why is this not as necessary to prevent the needless destruction of and damage to property, as to

prevent cruelty to dumb animals? How many horses are either temporarily injured, hopelessly ruined, or prematurely killed by the unskillfulness and carelessness complained of! In my opinion, most of the horses of this country do not live out over half their days of usefulness on this account.

But there are already some considerations that it would be well for all farriers, either pretended or real, to bear in mind. It is a well-recognized principle of law, that a person holding himself out to the world as a person of sufficient skill to do certain things, is liable for all damages resulting from his want of such skill as he has led those employing him to think he possesses. Thus, a man who holds himself out to the world as a surgeon, would be liable for all damages to a person who employs him; for instance, to set a broken arm, if, from the want of reasonable skill as a surgeon, he should so set the broken limb that it should thereafter be crooked, or partly or wholly disabled, on account of such bad setting. So a blacksmith, who claims to be a farrier, would be liable to the owner of a horse which such smith should injure, lame, or ruin, by reason of his want of skill as a farrier.¹

¹ "The case of *locatio operis faciendi*, is where work and labor, or care and pains, are to be bestowed on the thing delivered, for a pecuniary recompense; and the workman for hire must answer for ordinary neglect of the goods bailed (*i. e.*, intrusted to the workman), and apply a degree of skill equal to his undertaking. Every man is presumed to possess the ordinary skill requisite to the due exercise of the

There is another reason that should make an unskillful farrier cautious about carelessly inflicting such torture on a poor, helpless animal intrusted to his care.

art or trade which he assumes. . . . If he performs the work unskillfully, he becomes responsible in damages." 3 Kent's Commentaries, 588.

"Where skill, as well as care, is required in performing the undertaking, then, if the party purports to have skill in the business, and he undertakes for hire, he is bound, not only to ordinary care and diligence in securing and preserving the thing, but also to the exercise of due and ordinary skill in the employment of his art or business about it; or, in other words, he undertakes to perform it in a workmanlike manner. In cases of this sort, he must be understood to have engaged to use a degree of diligence, and attention, and skill, adequate to the due performance of his undertaking. And if he has not the proper skill, or if, having it, he omits to use it, or if he omits, in other respects, the proper degree of diligence and attention required for the work, he will be responsible for the damages sustained thereby by his employer. . . . It is the party's own fault, if he undertakes without having sufficient skill, or if he employs less than the occasion requires. And it has been well observed that, where a person is employed in a work of skill, the employer buys both his labor and his judgment. He ought not to undertake the work if he can not succeed; and he should know whether he can or not. Thus, if a farrier undertakes the cure of a lame or diseased horse, he is bound to apply a reasonable degree of skill to the cure; and if, through his ignorance or bad management, the horse dies, he will be liable for the loss. So, if a ship carpenter undertakes to build a ship, he engages for the exercise of reasonable skill, as well as proper care, in building it; and he will be liable for any loss or injury sustained by his employer by his negligence or want of skill- - . . . Of course, this doctrine is subject to the exception that the undertaker is per-

The subject of cruelty to animals is one that is well worthy of, and is exciting, the attention of not only all persons who have any feeling, but also of state legisla-

mitted to act on his own judgment; for, if his employer chooses to supersede the judgment of the undertaker, and requires his own to be followed, he must not only bear the loss, but pay the full compensation. . . .

“The degree of skill and diligence which is required rises also in proportion to the value, the delicacy, and the difficulty of the operation. . . .

“But, in all these cases where skill is required, it is to be understood that it means ordinary skill in the particular business or employment which the (workman) undertakes, or in which he is engaged. For he is not presumed to engage for extraordinary skill, which may belong to a few men only in his business or employment, or for extraordinary personal endowments or acquirements. Reasonable skill constitutes the measure of the engagement of the workman, in regard to the thing undertaken. . . .

“But even where the particular business or employment requires skill, if the (workman) is known not to possess it, or he does not exercise the particular art or employment to which it belongs, and he makes no pretense nor skill in it, then, if the (owner), with full notice, trusts him with the undertaking, the (workman) is bound only for a reasonable exercise of the skill which he possesses, or of the judgment which he can employ; and if any loss ensues from his want of due skill, he is not chargeable. Thus (to put the case borrowed from the Mahomedan law), if a person will knowingly employ a common mat-maker to weave or embroider a fine carpet, he must impute the bad workmanship to his own folly. So, if a man who has a disorder in his eyes, should employ a farrier to cure the disease, and he should lose his sight, using the remedies prescribed in such cases for horses, he would certainly have no legal ground of complaint.” Story on Bailments, §§ 431-435.

tures and other law-making bodies. Why should the man who inflicts temporary pain to a horse, by the momentary use of a whip, or in some such passing way, be punished, while he who inflicts lasting torture, by his criminal bungling, goes scot free? I believe that the laws for the prevention of cruelty to animals apply to these latter persons even more strongly than to the former.¹

¹ The following are the provisions of law, in the new Ohio Code of Laws, to go into effect January 1, 1880, relating to this subject of cruelty to animals:

SECTION 3714. *Ohio State Society.* The Ohio state society for the prevention of cruelty to animals, heretofore incorporated, shall be and remain a body corporate, with all the powers, privileges, immunities, and duties, throughout this state, hereinafter specified, as to county associations, and may appoint any person, in any county in this state where there is no such active association, to represent the state society, and to receive and account for all funds coming to the society, from fines or otherwise.

SEC. 3715. *Other societies authorized.* Societies for the prevention of acts of cruelty to animals may be organized in any county, by the association of not less than seven persons, and the members thereof shall, at a meeting called for the purpose, elect not less than three of their members directors, who shall continue in office until their successors are duly chosen.

SEC. 3716. *How incorporated.* The secretary or clerk of the meeting shall make a true record of the proceedings thereat, which he shall certify, and forward to the Secretary of State, who shall record the same; the record shall contain the name by which such association shall have determined to be known, and from and after the filing of the same the directors and associates, and their successors, shall be invested with the powers, privileges, and immunities inci-

dent to incorporated companies; and a copy of the record, duly certified by the Secretary of State, shall be deemed and taken, in all courts and places in this state, as evidence that such association is a duly organized and incorporated body.

SEC. 3717. *May elect officers and make regulations.* Such associations may elect such officers, and make such rules, regulations, and by-laws, as may be deemed necessary or expedient by their members for their own government and the proper management of their affairs.

SEC. 3718. *May appoint agents to enforce the law.* Such associations may appoint agents for the purpose of prosecuting any person guilty of any act of cruelty to animals within this state, who shall have power to arrest any person found violating any of the provisions of this chapter, or any other law, for the purpose of protecting animals, or preventing any act of cruelty thereto; and upon making such arrest, such agent shall convey the person so arrested before some court or magistrate having jurisdiction of the offense, within the city or county wherein the offense was committed, and there forthwith make complaint, on oath or affirmation, of the offense; but all appointments by such associations under this section must have the approval of the mayor of the city or village in which the association exists, and if it exists outside of any city or village, the appointments must be approved by the probate judge of the county; and the mayor or probate judge shall keep a record of all such appointments.

SEC. 3719. *Magistrates may authorize certain inspections.* When complaint is made, on oath or affirmation, to a magistrate or court authorized to issue warrants in criminal cases, that the complainant believes that any of the provisions of law relating to or affecting animals are being or about to be violated in any particular building or place, such magistrate or court shall issue or deliver immediately a warrant directed to any sheriff, constable, or police officer, or agent of such association, authorizing him to enter and search such building or place, and to arrest any person there present violating,

or attempting to violate, any such law, and to bring such person before some court or magistrate of competent jurisdiction within the city, village, or county within which such offense has been committed, to be dealt with according to law; and such attempt shall be held to be a violation of such law, and shall subject the person charged therewith, if found guilty, to the penalties provided therein.

SEC. 3720. *Police powers of officers and agents.* An officer, agent, or member of any such association may interfere to prevent the perpetration of any act of cruelty to animals in his presence, and may use such force as may be necessary to prevent the same, and to that end may summon to his aid any bystanders.

SEC. 3721. *Interpretation of certain words.* In this chapter, and in every law of the state relating to or in any manner affecting animals, the word "animal" shall be held to include every living dumb creature; the words "torture," "torment," and "cruelty," shall be held to include every act, omission, or neglect, whereby unnecessary, or unjustifiable pain or suffering is caused, permitted, or allowed to continue, when there is a reasonable remedy or relief; and the words "owner" and "person" shall be held to include corporations; and the knowledge and acts of agents employes of corporations, in regard to animals transported, owned, employed by, or in the custody of a corporation, shall be held to be the act of such corporation.

SEC. 3722. *Officers may require policemen to act.* Any such association may require the sheriff of any county, the constable of any township, the marshal or policeman of any city or village, or the agent of any such association, when the laws for the prevention of cruelty to animals have been violated, to take possession of any animal cruelly treated, in their respective counties, cities, or villages, and deliver the same to the proper officers of such association; and for such service, and for all services rendered in carrying out the provisions of this chapter, such officers, and the officers and agents of the association, shall be allowed and paid such fees as they are allowed for like services in other cases, which shall be

In conclusion, I would urge upon all persons interested in that noblest of animals, the horse, to help awaken and develop a feeling and sentiment that will call for the establishment of training-schools for instruction similar to those for surgical, medical, and pharmaceutical purposes, and to secure the passage of such laws as will prevent the ignorant and incompetent bunglers from either carelessly or otherwise torturing and damaging horses, as has so frequently been done in the past.

charged as costs, and reimbursed to the association by the person convicted.

SEC. 3723. *A person guilty is liable in damages.* A person guilty of cruelty to an animal, the property of another, shall be liable to the owner thereof in damages, in addition to the penalties prescribed by law.

SEC. 3724. *Conviction of agent no bar to action against principal.* The conviction of an agent or employé shall not bar an action for cruelty to animals against an employer for allowing a state of facts to exist which will induce cruelty to animals on the part of such agent or employer.

SEC. 3725. *Any person may care for animals unlawfully impounded.* When an animal is impounded, yarded, or confined, and continues without necessary food, water, or proper attention for more than fifteen successive hours, any person may, from time to time, and as often as it may be necessary, enter into and upon any place in which such animal is so impounded, yarded, or confined, and supply it with necessary food, water, and attention, so long as it there remains, or, may, if necessary or convenient, remove such animal, and shall not be liable to an action for such entry; and the reasonable cost of such food, water, and attention may be collected by him of the owner of such animal, and the animal shall not be exempt from levy and sale upon execution issued upon a judgment therefor.

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