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UNITED STATES DEPARTMENT OF AGRICULTURE
MISCELLANEOUS CIRCULAR NO. 69

Washington, D. C.

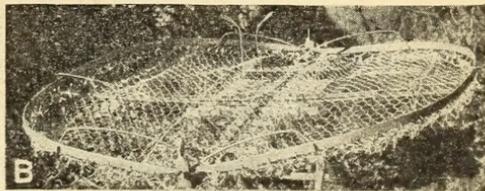
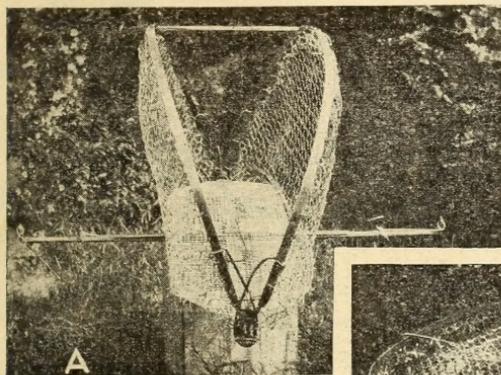
Issued June, 1926
Revised November, 1926

CONSTRUCTION AND OPERATION OF BIOLOGICAL SURVEY BEAVER TRAP

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THE BEAVER TRAP devised by the Biological Survey and described in Department Bulletin No. 1078, "Beaver Habits, Beaver Control, and Possibilities in Beaver Farming," has been greatly improved and strengthened until entirely satisfactory in operation. The new trap (fig. 1) has been thoroughly tested, and in March, 1926, a patent was obtained for the writer by the Department of Agriculture and dedicated to the use of the people of the United States. It is designed chiefly for capturing beavers alive for control and propagation, and can be manufactured by anyone for personal

use or for sale. The specifications and directions that follow should enable any machinist or practical mechanic to make the trap, at a cost for materials, in small lots, of about \$7, and for shop work about \$3.



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FIG. 1.—Biological Survey cage trap for taking beavers alive.

A, Trap held partly open to show construction. B, Trap set and ready to be placed in the water.

The trigger stands erect in the center of the set trap 10 to 12 inches high, so that when struck on any side by a swimming beaver it releases trigger bars and springs, and then the trap jaws close and lock above the captive animal. Details of construction shown in Figure 2

MATERIALS REQUIRED

(Italic figures in parentheses show the part as illustrated in Figure 2)

- 1 cold-rolled steel bar $1\frac{1}{4}$ by $\frac{1}{4}$ by 52 inches, for base bar (1).
- 2 cold-rolled steel bars each $\frac{7}{8}$ by $\frac{1}{8}$ by 83 inches, for trap jaws (5).
- 1 piece of flat iron $1\frac{1}{4}$ by $\frac{1}{4}$ by 52 inches, for cross bar (2).
- 1 piece of flat iron 1 by $\frac{1}{4}$ by 13 inches, for top cross bar (3).
- 2 pieces of flat iron each 1 by $\frac{1}{4}$ by 11 inches, for short cross bars (4).
- 2 pieces of strap brass each $\frac{3}{4}$ by $\frac{1}{8}$ by 6 inches, for clasp hooks (14).

- 2 pieces of No. 3¹ ($\frac{1}{4}$ -inch) oil-tempered spring-steel wire, each 8 feet long, for making the two coil springs (6).
- 1 piece of No. 6¹ oil-tempered spring-steel wire, 2 feet long, for trigger spring (8).
- 2 pieces of No. 6 oil-tempered spring-steel wire, each 10 inches long, for trigger bars (11).
- 1 piece of 1-inch mesh, No. 16¹ woven wire, galvanized before weaving, 50 inches long from a roll 60 inches wide, for bottom and sides of trap (15).
- 50 feet of No. 15¹ galvanized malleable wire, for lacing and linking wire mesh sides and floor of trap to jaws and bottom, for making trigger wires (9), trigger collar (10), and safety hooks (16), and for fastening trigger spring.
- 30 inches of No. 12 galvanized wire, for trigger (7).
- 5 quarter-inch bolts, four of them $\frac{3}{4}$ inch long and one 1 inch long, for attaching cross bars to base bar.
- 1 pair of $1\frac{1}{2}$ -inch brass hinges with strap-shaped sides, and two screw holes in each, for trigger loop (12).

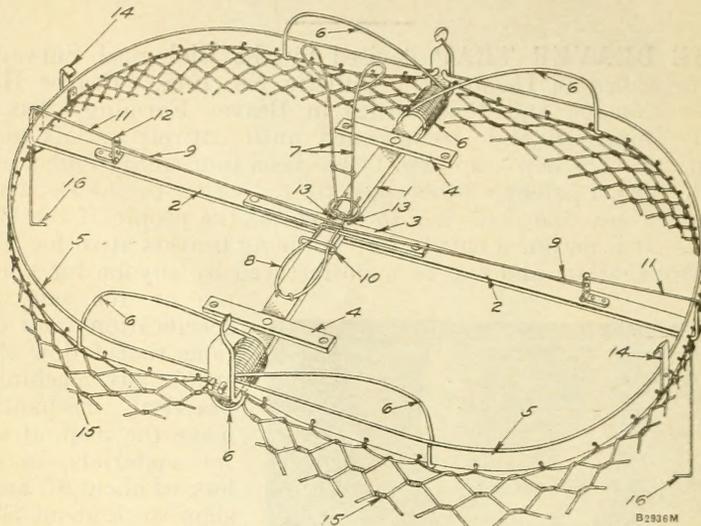


FIG. 2.—Details of construction of Biological Survey beaver trap

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|---------------------|--------------------------|-------------------|
| 1. Base bar. | 7. Trigger. | 13. Trigger grip. |
| 2. Cross bar. | 8. Trigger spring. | 14. Clasp hook. |
| 3. Top cross bar. | 9. Trigger wire. | 15. Wire mesh. |
| 4. Short cross bar. | 10. Trigger collar. | 16. Safety hook. |
| 5. Trap jaw. | 11. Trigger bar. | |
| 6. Coil spring. | 12. Hinged trigger loop. | |

SHOP WORK

Drill $\frac{7}{16}$ -inch holes as follows: Two side by side, 3 inches from each end of base bar; and one $\frac{1}{4}$ inch from each end of long cross bar.

Drill $\frac{1}{4}$ -inch holes as follows: One in center and one at 13 inches from each end of main cross bar; one in center and one 6 inches each side of center of main cross bar; one in center and one $\frac{1}{2}$ inch from each end of 13-inch cross bar; and one in center and one $\frac{1}{4}$ inch from each end of each 11-inch cross bar.

Drill $\frac{3}{16}$ -inch holes as follows: At 3-inch intervals along flat jaws, $\frac{1}{8}$ inch from outer edge and to about 4 inches of the ends; one in middle of one trap-jaw bar 8 inches to right of center and one in the other 8 inches to left of center of trap; two in middle of main cross bar at 8 and 9 inches from each end, for hinges for trigger loops.

¹ All wire sizes are standard American gauge.

Heat and turn up ends of base bar at right angles, 4 inches from ends, then heat and make a short quarter twist 2 inches from tips of turned-up ends, and thin the inner edge of twisted section to one-eighth inch thick where it comes between trap jaws, to keep them from passing the center.

Heat and turn up at right angles the ends of long cross bar, 1 inch from tips.

Heat and round and turn out at right angles 2-inch tips on each end of the two flat steel bars for jaws, to fit the holes at the ends of the base bar. In rounding the ends of the jaw strips the tapering should be on the outer edge, so that the tips may be almost in line with the inner edge.

Wrap No. 3 wire for coil springs $12\frac{1}{4}$ times closely around a $1\frac{1}{2}$ -inch iron pipe or hardwood rod, leaving one end about 16 and the other about 14 inches long, with the two ends at right angles when open and free. The springs will unwind one full turn when released, leaving $11\frac{1}{4}$ turns. Heat and bend the tips of free ends of springs to form hooks to clasp the jaws when crossed.

Bend the 24-inch No. 6 wire in form of hairpin, for the trigger spring, about 10 inches long and 3 inches wide at the open end.

Bend 1-inch loop in one end of each of two 10-inch No. 6 wires, for trigger bars.

ASSEMBLING THE PARTS

Bolt longest cross bar at right angles under base bar with the 13-inch cross bar above, with a 1-inch bolt through center and two $\frac{3}{4}$ -inch bolts through holes in ends of 13-inch bar and corresponding holes in long cross bar.

Fasten the two 11-inch short cross bars across top of base bar, with a $\frac{3}{4}$ -inch bolt through the middle of each and through the hole 8 inches from the upright ends, to support bottom of trap.

Slip coil spring over bent-up ends of base bar until below right-angle bend, with shortest arm next to jaws.

Bend jaws in a depressed semicircle around wooden form so that they will fit together when in place and reach just inside of bent-up tips of cross bar when open.

Spring bent-up tips of jaws into holes in turned-up ends of base bar, and make all necessary corrections of curving so that jaws will fit together.

Clasp shorter end of spring on one jaw, and use pressure to bring the longer end across to clasp the other jaw in an upright position.

Weave 3-inch half-hitch loops of No. 15 wire through holes drilled 3 inches apart in the trap jaws, the loops outward, and twist the clasping parts down tight to jaws.

Hook the 1-inch loop at one end of each of the 10-inch No. 6 steel-wire trigger bars downward into holes at ends of main cross bar, and close up loops so they work freely.

Rivet the two small brass hinges at the holes 8 and 9 inches from ends of main cross bars, so that the free ends will stand upright about 7 inches from the turned-up ends of bars. A small hole should be first punched or drilled near the middle of the free part of each hinge, and the terminal screw hole enlarged to form a loop that will admit the tip of the trigger bar loosely.

Make the trigger of No. 12 galvanized wire, bent in the middle into a 2-inch circle, with downward projections one-fourth inch below

the circle to grip (13, in fig. 2) arms of spring and hold them half closed, and with the two free arms standing erect, 11 inches high, the ends looped to desired height. Pushing this trigger in any direction lifts the downward projections (grips) of the circle, releases the trigger spring, and springs the trap.

Trim the No. 16 woven wire for sides and bottom to fit inside of arch of closed trap jaws and wire the bottom securely to top of base bar at ends and middle and to ends of short cross bars. The inner arm of spring should be thrust up through an opening in the mesh.

Wire closed end of trigger spring to wire mesh of floor of trap, in line with base bar, the free ends extending $2\frac{1}{2}$ inches beyond center. A wire loop or collar of No. 15 wire passed over both arms of trigger spring near middle and under wire mesh will hold it in place and prevent its opening too far.

Attach a No. 15 galvanized wire to each arm of the trigger spring at center line of trap, making the two wires cross and reach to middle hole of hinged trigger loops on opposite sides of trap. Fasten the ends of the crossed trigger wires connected with trigger spring through the middle holes in the free part of the hinge so that when the sides of the trigger spring are open the upright trigger loops will not reach the tips of the trigger bars, and when the trigger spring is held together by the trigger grips the loops will remain on the ends of trigger bars to hold down the trap jaws.

Fasten upper edges of woven-wire side pieces to loops along trap jaws, using No. 15 galvanized wire and lacing the edges together so as to give flexibility to sides of trap.

Rivet a flat hook (14, in fig. 2) loosely on top of each trap jaw, in the holes drilled 8 inches from middle of trap, facing the hooks opposite ways, so that they will clasp the closed jaws and the trap can not be opened from within.

OPERATING THE TRAP

Open trap jaws part way and place trigger on trigger spring to hold it half closed and release tension on trigger loops.

Bring down one jaw and secure it in place by trigger bar and hinged trigger loop, holding loop upright by a safety hook (16, in fig. 2) to keep trap from springing. Repeat the operation with other jaw.

Lift trap by base bar or cross bar underneath, and carry edge up to the water where it is to be placed, or, if set from a boat, slide the trap over one side until the lower edge rests on the bottom, then lower as boat is pushed back, leaving the trap in desired position.

Release the safety hooks from trigger loops as last act when trap is satisfactorily placed.

Set trap in beaver canal, in creek or feeding place, or in front of landing place, in water about a foot deep, either on the bottom or on stones or forked stakes or cross bars, with tip of trigger about 2 inches below surface of water. The trigger can be bent over or straightened up to desired height for different depths of water, varying from 10 to 16 inches.

Scatter aspen twigs back of trap, so that to get them the beaver will have to swim against the trigger, thus springing the trap. The trap may also be sprung by fastening one end of an aspen twig to the trigger and letting the other project above the water so that the trigger will be moved when the twig is pulled by the beaver.

A captive beaver can be carried to camp inside the trap, or in a gunny sack, which can be slipped over the head and body while the animal is still in the trap. Considerable time and patience are required to prevent frightening or exciting trapped beavers, and all movements should be slow and quiet. Care must be taken at first not to give the animals a chance to use their teeth, but as soon as they get over being frightened they are easily handled.

