E. M. CRANDAL.

BARBED FENCE-WIRE.

No. 184,844. Patented Nov. 28, 1876.

FIG. 1.

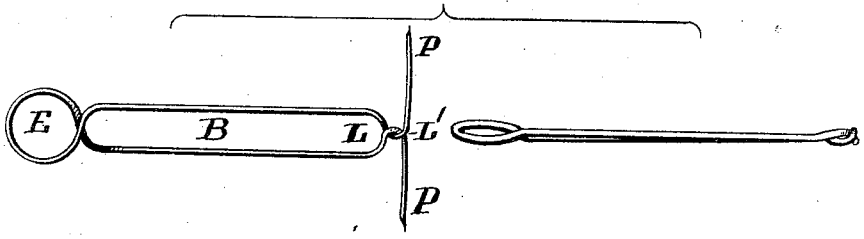


FIG. 2.

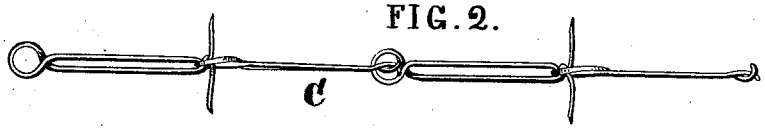
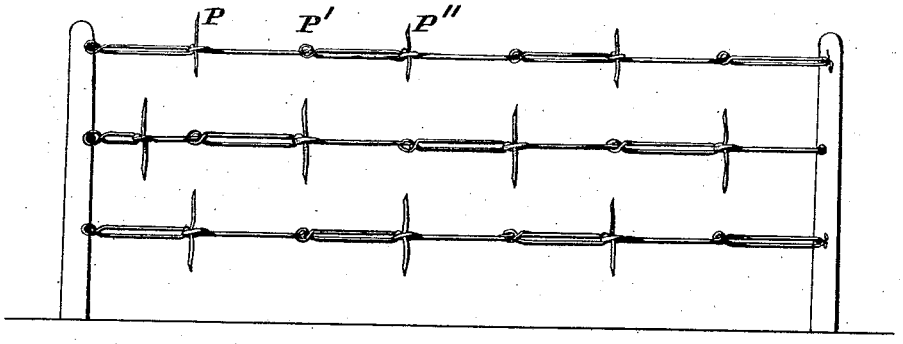


FIG. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

EDWARD M. CRANDAL, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF HIS RIGHT TO CHARLES M. KIRKHAM, OF SAME PLACE; AND SAID E. M. CRANDAL AND CHAS. M. KIRKHAM, ASSIGNORS TO JOHN A. ROEBLING'S SONS COMPANY, OF TRENTON, NEW JERSEY.

IMPROVEMENT IN BARBED FENCE-WIRE.

Specification forming part of Letters Patent No. **184,844**, dated November 28, 1876; application filed October 26, 1876.

To all whom it may concern:

Be it known that I, EDWARD M. CRANDAL, of No. 9 Wabash Avenue, city of Chicago, county of Cook, and State of Illinois, have invented a new and Improved Barbed-Wire Chain-Cable and Barbed-Wire Fence; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to wire cables for wire fences, barbed as a defence against the attacks of animals, and especially to the kind composed of links barbed and interlocked so as to form a barbed chain.

The invention consists, first, in a barbed ring-link for wire fences; second, in a barbed ring-link composed of a length of wire bent and turned back and over, so as to form an eye out of the center of the length, and having its two ends barbed or pointed, crossed over and under each other, and then twisted and interlocked, so as to leave the points projecting outward; third, barbed ring-links, such as are described in the preceding clause, (second,) with the points projecting outward in the plane of the link; fourth, in barbed-wire ring-links interlocked end to end in regular order, so as to form a barbed chain fence-cable; fifth, in ring-links having an eye at one end, and barbed, interlocked, and twisted points at the other end, these points being engaged in the eye of its adjoining link at one end, and engaged in its own eye with the barbed, interlocked, and twisted points of the adjoining link at the other end; sixth, ring-links provided at one end with an eye, and at the other end with barbed points interlocked in regular order, eyes with barbed points, and each set of points standing at right angles to the planes of the two adjoining sets of barb-points; seventh, ring-links provided at one end with an eye formed in a common plane with the body of the link, and at the other end with barbs or points interlocked in regular order, eyes with barbed points, and each set of barb-points extending at right angles to the planes of the two adjoining sets of barb-points.

Figure 1 shows a barbed ring-link of the chain-cable for a wire fence. Fig. 2 shows (4) four engaged links of the cable. Fig. 3 shows a "length" of fence with the chain-cables extending in three lines between fence-posts.

Fence-wire cables provided with barbs, and composed of one or more wires or strands, have been made anterior to my invention. When composed of more than one wire, these wires have been twisted in various ways, and engaged with barbs of various forms, the wires themselves consisting of continuous or of overlapping lengths laid side by side.

Fence-wire chain-cables provided with barbs have been made anterior to my invention herein described, composed of links formed of a single wire or strand bent and engaged with the adjoining links at each end, as shown in my invention described in Patent No. 174,664, dated March 14, 1876.

The link forming part of the invention herein described is a ring-link, and differs from the link previously used in being formed of a length of wire bent in the center, returned upon itself, and interlocked near its two ends, so as to form a ring. The two ends are returned, so far as the body of the link is concerned, parallel to each other, and in the general line of strain to be put on them in the cable. The ends of the length of wire are cut diagonally or otherwise pointed, so as to form barbs. The barbed ring-link has these general characteristics. It also has the following specific characteristics:

At the center of the length of wire an eye, E, is formed, of sufficient size to receive the interlocked ends and barbs of the adjoining link L by crossing the wires over and under each other, as shown in Fig. 1, at about the distance of one inch from the two ends. The wires are first recrossed and then turned sharply at right angles, or nearly so, to the body of the link.

The eye and the lock of the wire at the ends may be formed by turns and twists or knots

of different degrees or extent, or of any different known kinds; but I prefer the form shown and described.

I prefer to dispose the eye E, the body B, and the barbed points P P all in one common plane; but they may be placed at any other suitable angle, either of them.

I cut the wire for the links into lengths of about twelve inches, which form links of about five inches in length.

The lock L′ at the two ends of the length of wire I make as follows: Pointed lengths of wire are bent like staples in form, by means of a simple staple-machine. Boys then put them together, twisting the two ends across each other, and leaving the barbs projecting outward, as shown. The next staple is first engaged with the twisted end of the first link, and thereafter twisted in like manner.

The eye E I make as follows: After the staple has been engaged with the barbed end of the preceding link, so as to cross the knot of the twist at right angles to the plane of the barbs, the two branches are bent across each other so close up to the barbs as to allow them only the necessary freedom of motion, as shown. The eye may, however, be omitted, and the barbs be left free to slip back and forth in the adjoining link. Successive repetitions of these operations construct the chain-cable.

This method of formation has the effect of leaving the barbs P P′ P″, Fig. 3, in such relation that each one of the sets of barbs stands at right angles to the sets each side of it. Consequently, when the cables C C are formed into a fence, as shown in Fig. 3, points are presented in four directions at any given part of the cable, and, however it may be turned or twisted, some of the points must take effect upon cattle in contact with the fence.

It is evident that slight increase or other change in the cross-over and twist of the eye E and the barb P, respectively, will cause the barbs to point in directions between the two planes at right angles, as shown and previously described.

The operation of the parts, formed as described, is as follows: The eye E holds the locked barbs P in place, preventing the links from sliding together, and thus creating what may be called "take-up" in the cable. At the same time, when any strain is put on the cable in any way, it is equalized and distributed throughout the links, which tend to pull together and lock, thereby increasing the strength of the cable as the tension increases by the more perfect gripe of each link upon its fellows. Where two or more wires are used to form a fence-wire cable, placed side by side, twisted or not twisted, it is practically impossible to get an equal tension on the several wires. In my invention, however, there is an instant and continuous tendency to self-adjustment and equalized strain in each link, and in each side of each link, and consequently throughout the cable, the effect of which is to give the benefit of a greater part of the tensile strength of the two sides of the ring-link, which is not brought simultaneously into use in other cases where two or more strands or wires are employed side by side in an ordinary twisted cable.

The formation of the eye E and the interlocked barbs P engaged therein prevents each link from falling back upon the adjoining link, so as to create a kink, since the barbs strike the eye when moved in either of two opposite directions, while in the two directions at right angles therewith the links may be folded in skeins and shipped in boxes.

There being no take-up, there is also no stretching of the cable to be done in putting it up; but it may be put up from post to post with ease, and secured thereto in any known manner.

In case any link becomes broken it may be readily replaced by a new link, or even any simple connection of the two ends left will restore the cable to usefulness with undiminished strength.

The same quantity of wire disposed in these ring-links will give a greater length of barbed cable than when the wires are laid side by side and twisted, since the twists take up a considerable lineal length of wire, which does not increase the resulting length of the cable, and this without proportionate increase of strength for size and weight per yard of wire.

I do not intend to confine my invention strictly and alone to the form of link provided with the eye. The eye may be omitted entirely, and in that case the adjoining links may slide together somewhat in packing and handling, the strain will be more direct, and the length of cable produced from a given length of wire will be greater.

I claim as my invention—

1. A ring-link for wire-fence chain-cable, provided with barbs, substantially as specified.

2. A series of barbed ring-links, forming a wire fence-cable, composed of a length of wire bent and turned back and over, so as to form an eye out of the center of the length, and having its two ends barbed or pointed, crossed over and under each other, and then twisted and interlocked, so as to leave the points projecting outward.

3. A series of barbed ring-links, forming a wire fence-cable, provided with an eye at one end, and interlocked barbed points at the other, the barbs of which project outward in the plane of the link and its eye, as shown and described.

4. A series of barbed wire ring-links, interlocked end to end in regular order, so as to form a barbed chain fence-cable, substantially as described.

5. A series of ring-links having an eye at one end, and barbed, interlocked, and twisted points at the other end, these points being

engaged in the eye of its adjoining link at one end, and engaged in its own eye with the barbed, interlocked, and twisted points of the adjoining link at the other end.

6. Ring-links provided at one end with an eye, and at the other end with barbed points interlocked in regular order, eyes with barbed points, and each set of points standing at right angles to the planes of the two adjoining sets of barb-points.

7. Ring-links provided at one end with an eye formed in a common plane with the body of the link, and at the other end with barbs or points interlocked in regular order, eyes with barbed points, and each set of barb-points standing at right angles to the planes of the two adjoining sets of barb-points.

8. A barbed wire-fence chain-cable composed of barbed ring-links.

In testimony whereof I have hereunto subscribed my name this 14th day of October, in the year 1876.

EDWARD M. CRANDAL.

Witnesses:

WILLIAM B. HIBBARD,

JOHN S. BURROUGHS.