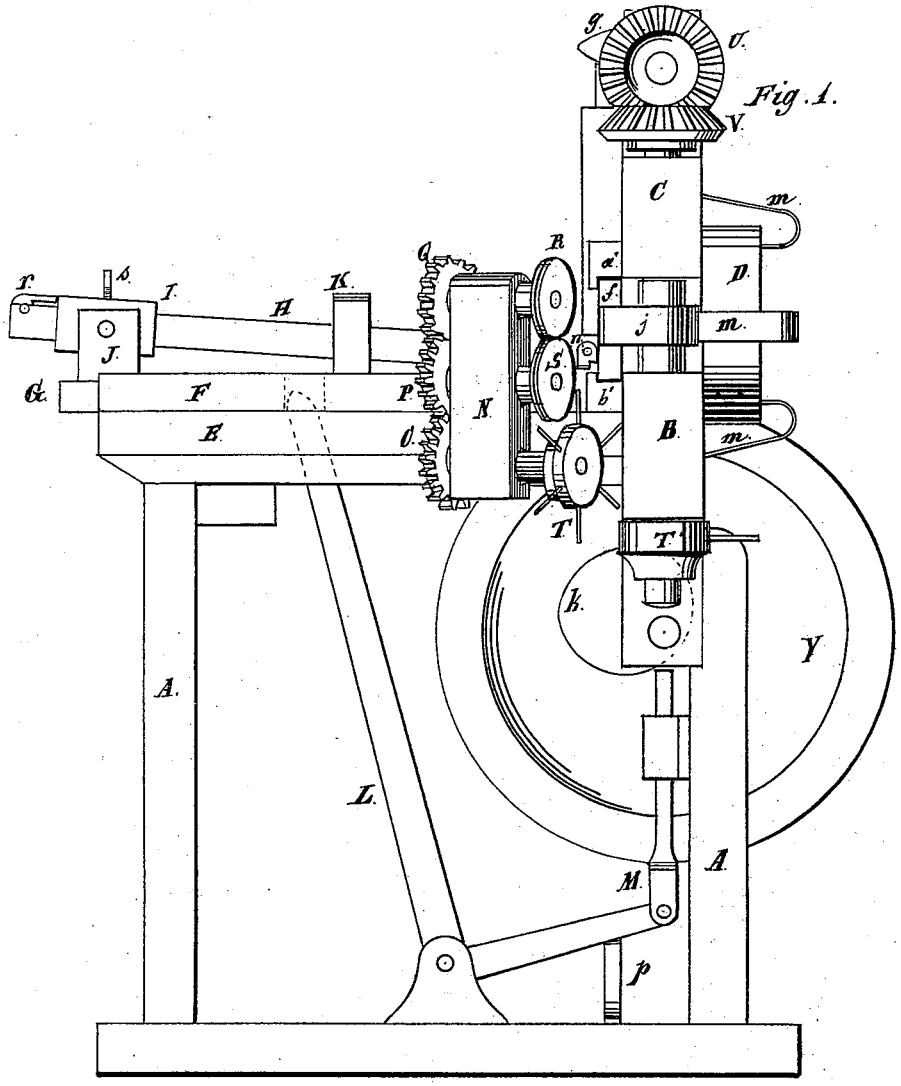
4 Sheets—Sheet 1.

D. C. STOVER.

WIRE-BARBING MACHINE.

No. 188,436. Patented March 13, 1877.

Fig. 1.



Witnesses:
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H. F. Brune.

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4 Sheets—Sheet 2.

D. C. STOVER.

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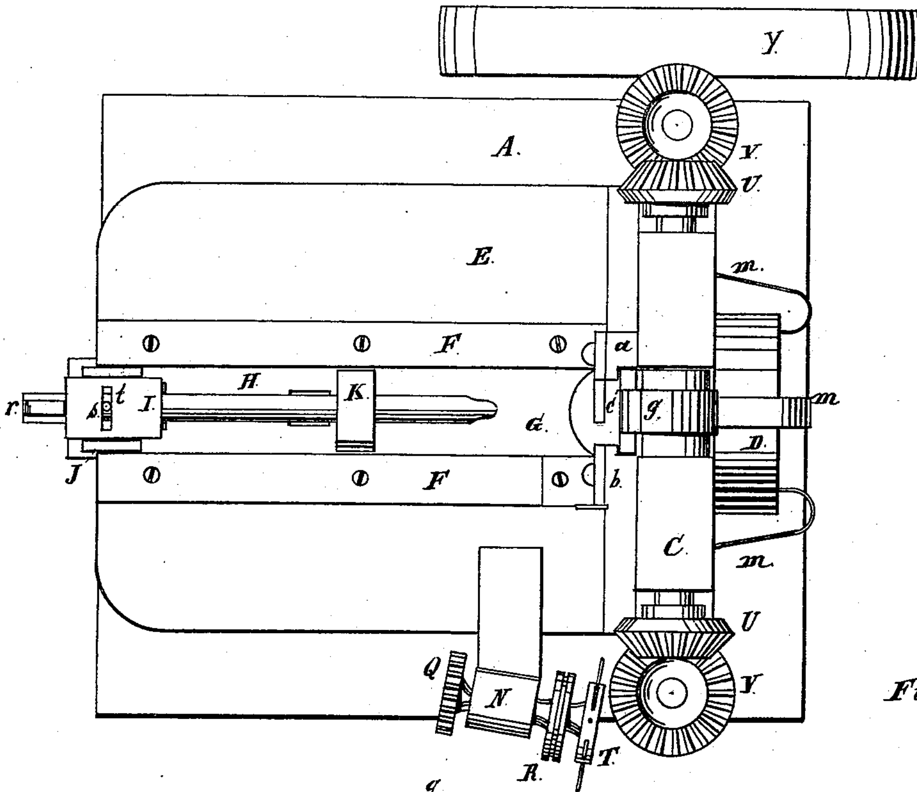

Fig. 2.

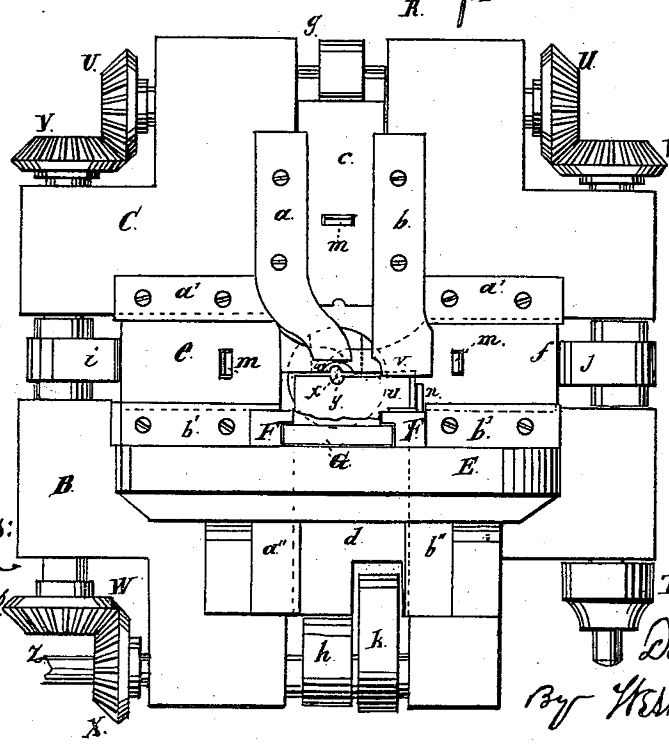

Fig. 3.

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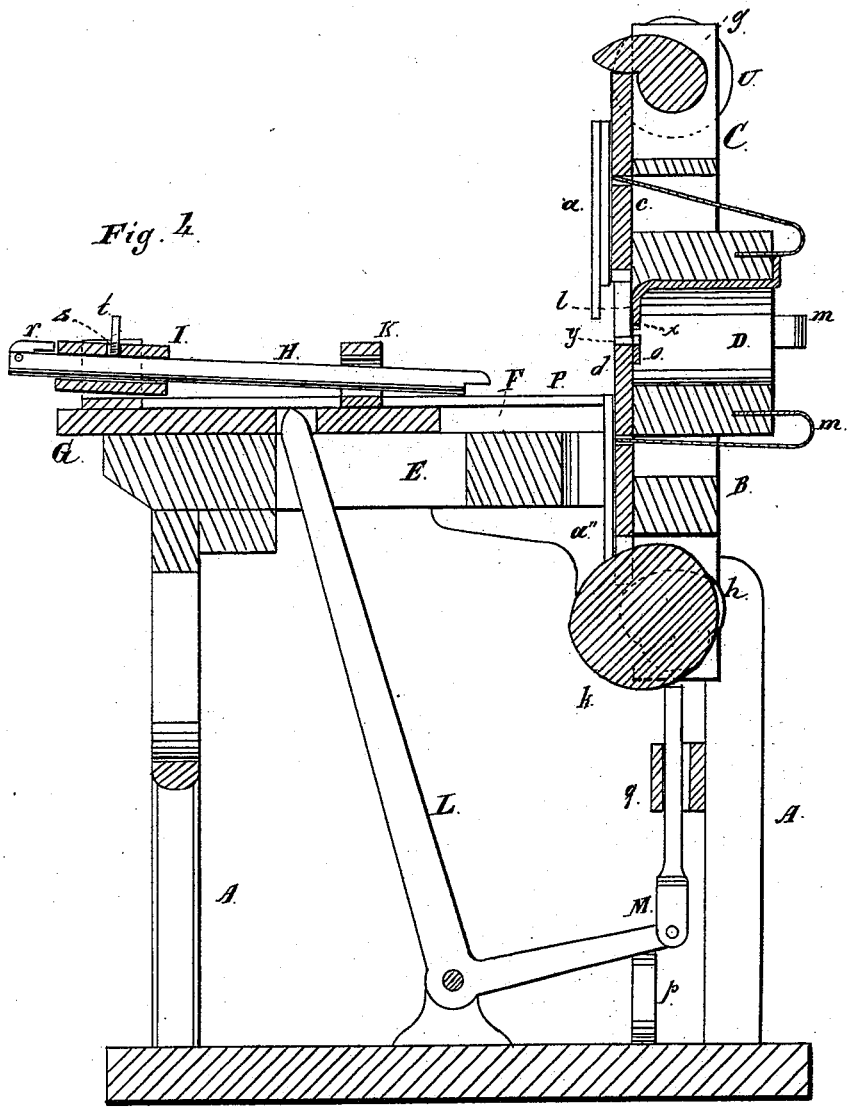
4 Sheets—Sheet 3.

D. C. STOVER.

WIRE-BARBING MACHINE.

No. 188,436. Patented March 13, 1877.

Fig. 1.



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4 Sheets—Sheet 4.

D. C. STOVER.

WIRE-BARBING MACHINE.

No. 188,436. Patented March 13, 1877.

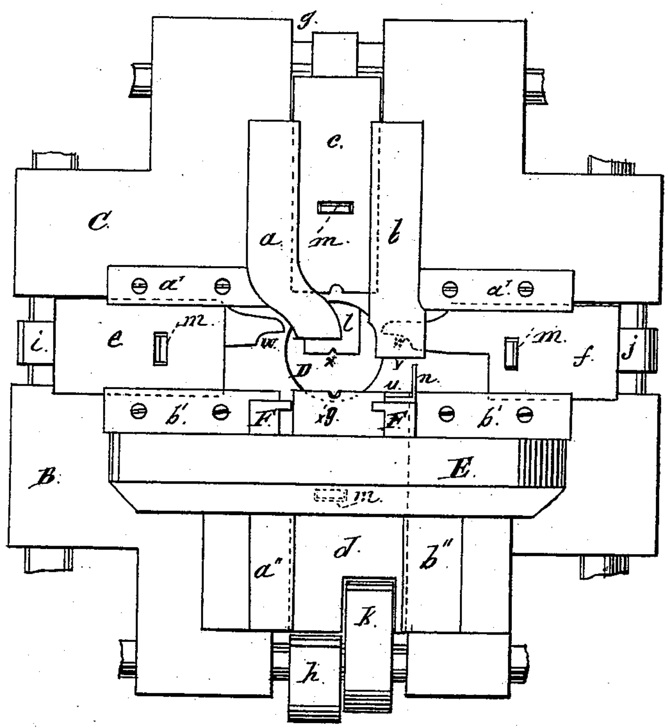

Fig. 5.

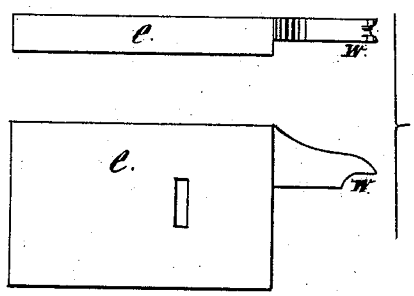

Fig. 6.

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UNITED STATES PATENT OFFICE.

DANIEL C. STOVER, OF FREEPORT, ILLINOIS.

IMPROVEMENT IN WIRE-BARBING MACHINES.

Specification forming part of Letters Patent No. **188,436**, dated March 13, 1877; application filed October 25, 1876.

To all whom it may concern:

Be it known that I, DANIEL C. STOVER, of Freeport, Stephenson county, State of Illinois, have invented new and useful Improvements in Machines for Putting Barbs on Wire, of which the following is a full description, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation; Fig. 2, a plan view; Fig. 3, a rear view with the frame omitted; Fig. 4, a longitudinal vertical section; Fig. 5, a front view with the frame and driving-wheels omitted; Fig. 6, details of the side hammers or plates.

The object of this invention is to apply barbs to all kinds of wire used in making fences, firmly and expeditiously; and its nature consists in feeding the main or fence wire into the machine at intervals; in feeding in a cross-wire, from which the barbs are formed at the same intervals; in forcing the barbs tightly into position by a series of hammer or slides; and in the several devices and combination of devices for operating the parts hereinafter more fully described and claimed as new.

In the drawings, A represents the main frame; B C, the head-block or frame; D, the discharge-opening; E, the platform; F, the guides; G, the slide; H, the tube through which the main wire passes; I, the pivoted block to which the tube H is attached; J, the supports for the block I; K, the tube-guide; L, the lever for operating the slide G; M, the bar or pitman for operating the lever L; N, the bearing-block; O P Q, the gear-wheels operating the feed of the cross-wire from which the barbs are formed; R S, the guide-wheels for the barb-wire; T, the spur-wheel; T′, the pin-wheel; U V W X, the gear-wheels; Y, the balance-wheel; Z, the main shaft; *a* a^1 a^2 *b* b^1 b^2, the guide-plate; *c d*, the plates or hammers moving vertically; *e f*, the plates or hammers moving laterally; *g h i j*, the cam-wheels or eccentrics for operating the hammer-plates; *k*, the eccentric for operating the lever L; *l*, the fixed plate against which the main wire is driven; *m*, the springs for returning the hammer-plates; *n*, the guide through which the barb-wire is fed; *o*, the outward projection on the plate *d*; *p*, the spring for returning the lever L; *q*, the support for the bar M; *r*, the clamp on the rear end of the tube H; *s*, the opening in the pivoted block I; *t*, the pin for rocking the tube H; *u v*, the cutter; *w*, the shoulders on the plates *e f* for setting the barb; *x*, the holes in the plates *l o* for holding the main wire when the tube H returns; *y*, the groove in the face of *d*, into which the main wire and barb are forced so as to form the barb V-shaped.

The frame-work A B C and platform E may be made of iron, or partly of iron and partly of wood. The head B C may be made of iron, and in any suitable form for supporting the parts which attach the barb. It is provided with a central opening, D, large enough to pass the wire after the barbs are applied. Its rear face is furnished with guide-plates *a* a^1 a^2 *b* b^1 b^2, for holding the sliding parts in position.

The sliding plates or hammers *c d* are each provided with a groove across their working-faces, made sufficiently deep to take in nearly or quite one-half of the main wire. The side plates or hammers *e f* are cut away at *w*, as shown, so as to pass over the main wire and bend the barb, and bring the shoulder up to the main wire, so as to firmly set the barbs in position. These plates *c d e f* are operated by the cams or eccentrics *g h i j*, which cams are operated from the gear-wheel X on the main shaft Z, through the wheels W V U, as shown.

The platform E is provided with guideways F, between which the plate G is operated. This plate carries the tube H, through which the main wire passes, which tube is pivoted by the block I to the supports J, so that the front end of the tube may rise and fall within the limits of the opening K. The tube H is provided at its rear end with the eccentric or clamp *r*, which operates automatically, and holds the wire for the purpose of feeding. The tube H is also provided with a pin, *t*, working in the slot *s*, by means of which the tube and the wire within it may be rocked, so as to give the barbs different projections upon the main wire, if desired.

The cross-wire from which the barbs are cut is passed in between the grooved rollers or wheels R S, through the loop or guide *n*.

This wire passes under the guide-plate *b*, which may be sharpened at its lower end at *v*, or a shear-blade may be attached thereto, so that when the hammer-plate *d* rises, the wire will be severed at *u* with an angular cut, so as to give the barbs sharp points. This barb-wire is fed up at suitable intervals by means of the gear-wheels O P Q, which are operated by the spur or spoke wheel T and the pin-wheel T′, which advances the wheel T one step at each revolution or complete operation of the devices for fastening the barb, thus advancing a sufficient portion of the cross-wire to form a new barb at each operation. These devices can be readily arranged to so adjust the feed as to give the desired length to a completed barb.

The points or inner ends of the plates or hammers *e f* are grooved on the top, so as to catch the ends of the barbs and carry them over to the opposite sides.

The springs *m p*, in the form shown, are simply bent plates, used for returning the parts into position to be operated upon by the eccentrics or cams. This form will be found convenient; but, in practice, they may be made in any other suitable form which will accomplish the desired result of returning the parts.

In operation the main wire is passed through the tube H, with its end projecting out far enough to attach the first barb. The cross or barb wire is supported upon any suitable spool, which may be detached from the machine or attached thereto, as desired. Its end is passed between the grooved wheels R S, and through the loop *n*. The machine is now ready for starting.

In the first movement the tube H is advanced by the eccentric *k* pressing against the end of the rod M, which moves the lever L, causing the plate G, with the tube H and appliances, to advance, so that the end of the tube comes up over the hammer-plate *d*, and under the guide *a*. When this tube H has advanced about two-thirds of this distance, the pin or arm on the wheel T′ will come in contact with one of the spurs or arms of the wheel T, causing it to advance and, through the gear-wheels O P Q and grooved wheels R S, force the cross or barb wire forward under the main wire the desired length for the barb. In this position, with the end of the tube H over the barb-wire, as described, the hammer-plate *d* rises by means of the eccentric *h* coming in contact with the lower end thereof, and the cross or barb wire is severed at *u* by means of the cutter *v*. The main wire, with the barb, is then carried up by the continued rising of the plate *d*, until the end of the tube H strikes the lower end of the plate *a*, when the barb and wire are forced into the groove *y* on the face of the hammer-plate *d*, which causes the barb to assume a V shape. Then the tube H recedes, the main wire being held firmly between the end of the plate *l* and the part *o* of the hammer *d* in the hole *x*. Then the side hammers *e f* are forced forward, simultaneously, by means of the cams *i j* coming in contact with the outer ends of the hammer-plates, and the ends of the barb being above the points of the hammers or plates *e f*, these points will catch the ends of the barbs and cross them over to opposite sides, so as to encircle the main wire, and the shoulders *w* of these plates will strike against this encircling portion of the barb, and bring it in close contact with the main wire, and force the barb ends at nearly right angles therewith. Then these hammer-plates *e f* are released from their contact with the cams *i j*, and will be returned to their first position by means of the spring *m*. The hammer or plate *c* will now descend by means of the cam *g* coming in contact with the upper end thereof, and, striking the barb on top, will complete the fastening, and set the barb firmly in position, so that it will not move. Then the plates *c d* will be returned to their first positions through the springs *m*, leaving the main wire and barb free to be passed through the opening D by the forward movement of the tube H, which takes place as soon as the hammer-plates *c d* are returned. The hammers or plates *e f* are so formed at their points or inner ends that they will pass each other, so as to cross the barb-wire, and permit the shoulders *w* to come in contact with the encircling portion thereof. These hammers *e f* are advanced and returned simultaneously, so that when advanced they will act upon both points of the barb at the same time, and thus insure the proper coiling of the barb-wire around the main wire. The hammer *d*, after it is raised, will remain in that position, and serve the purpose of an anvil for the completion of the fastening by the hammer *c*. Both of the hammers *c d* will return to position simultaneously.

The clutch or clamp *r* on the end of the tube H is to be operated automatically by any suitable means, so that it will be in contact with the main wire, and advance when the tube H is moved forward, but will be disengaged therefrom when the tube H returns, thereby advancing or feeding the main wire so that barbs will be applied at regular intervals. By extending the guide *a* inward, as shown, the upward movement of the tube H is limited, so as to prevent any bending or kinking of the main wire while the barbs are being fastened, and also to furnish a means for forcing the barb into the groove *y* on the hammer *d* to form the V shape; but some other form of stop might be used for this purpose.

It will be seen that by the method herein described the turn or coil of the barb around the main wire is firmly held against it, so that when the blow or pressure from the hammer or plate *c* is given, the encircling portion retains its form, without being made oval or driven away at the sides, so that the coil is in

close contact with the main wire around the entire circle, and so that the barbs will not work loose, as they are firmly held against the main wire at all points.

Figs. 1, 2, 3, and 4 show the position of the parts just before the hammer *c* descends, while Fig. 5 shows the position of the hammers or plates at the commencement of the operation.

What I claim as new, and desire to secure by Letters Patent, is as follows:

1. The pivoted tube H, in combination with the sliding plate G and lever L, for carrying the main wire forward, substantially as specified.

2. The tube H, in combination with the sliding plate G, lever L, pitman M, and cam or eccentric *k*, substantially as described.

3. The tube H, in combination with the pivoted bearing I, for permitting a free upward movement of the inner end of the tube, substantially as set forth.

4. The tube H, in combination with the clutch *r*, attached thereto for holding the main wire so that it will be carried forward with the tube, and released in returning, substantially as set forth.

5. The stationary plate *l*, having an opening, *x*, in combination with the hammer-plate *d*, having the part *o*, and the cam-wheel *h*, for holding the wire while the tube H is receding, all constructed and operating substantially as and for the purpose set forth.

6. The hammer or plate *d*, having a groove, *y*, in its face, in combination with the tube H, and plate *a*, and cam *h*, for forcing the barb into the groove *y*, substantially as specified.

7. The hammers or plates *e f*, in combination with the cams or eccentrics *i j*, for crossing the barb, and carrying the points thereof to opposite sides, substantially as specified.

8. The hammers or plates *e f*, provided with shoulders *w*, for forcing the encircling portion of the barb tightly onto the main wire, substantially as described.

9. The hammer or plate *c*, in combination with the cam or eccentric *g*, for forcing the hammer down, and completing the fastening of the barb, substantially as specified.

10. The wheel T′, provided with an arm or projection, in combination with the spur-wheel T, for feeding the barb-wire forward at regular intervals, substantially as described.

11. The guide *n*, in combination with the grooved wheels R S, for keeping the barb-wire in position, and holding it while being cut, substantially as described.

12. The wheels W V U, in combination with the wheel X, for operating the parts, substantially as specified.

13. The springs *m*, in combination with the plates *c d e f* and eccentrics or cam *g*, *h*, *i*, and *j*, for returning the plates, substantially as specified.

14. The guide-plate *a*, extending inward to limit the lifting of the feed tube or wire, and preventing kinking of the main wire, substantially as specified.

15. The plates *c d e f*, in combination with suitable operating devices for wrapping and securing a barb onto a main wire equally at all points of contact with the wire, substantially as specified.

16. The method of attaching barbs to a main wire by first bending the barb-wire across, so that the ends will project above such main wire, then crossing the ends, then setting the crossing against the main wire, all by a succession of blows, substantially as specified.

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