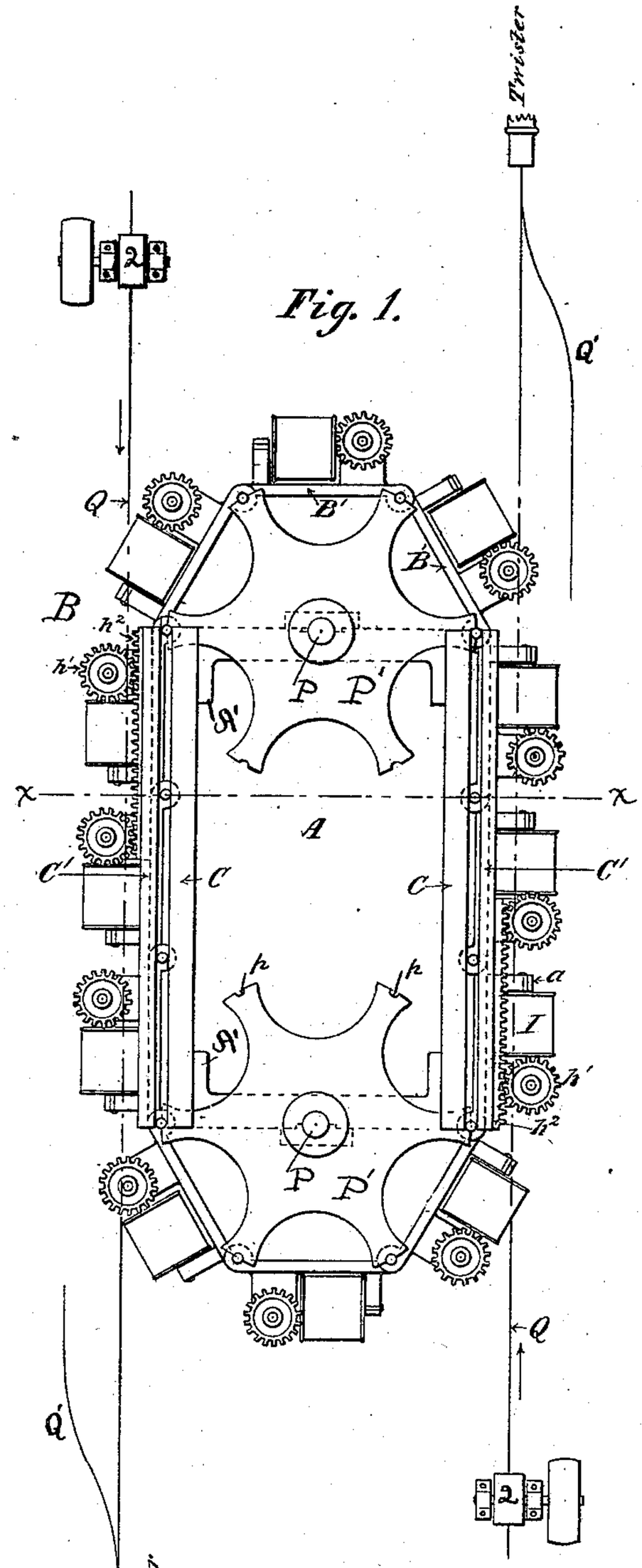
(No Model.) 2 Sheets—Sheet 1.

A. C. PAUL.

WIRE BARBING MACHINE.

No. 316,909. Patented Apr. 28, 1885.

Fig. 1.



Witnesses
Chas. A. Pratt
Jno. Dickinson

Inventor
Amasa C. Paul

(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

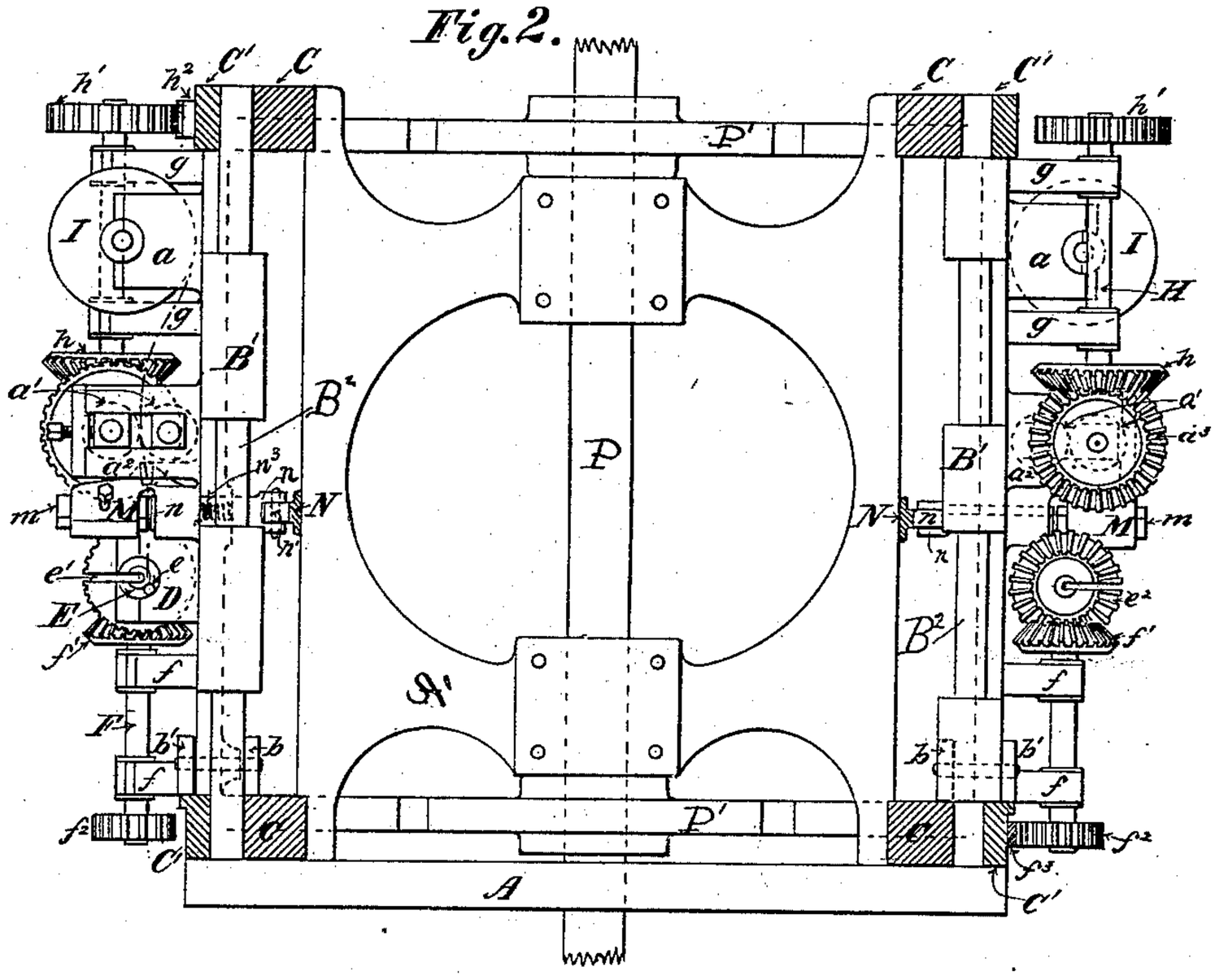


Fig. 3.

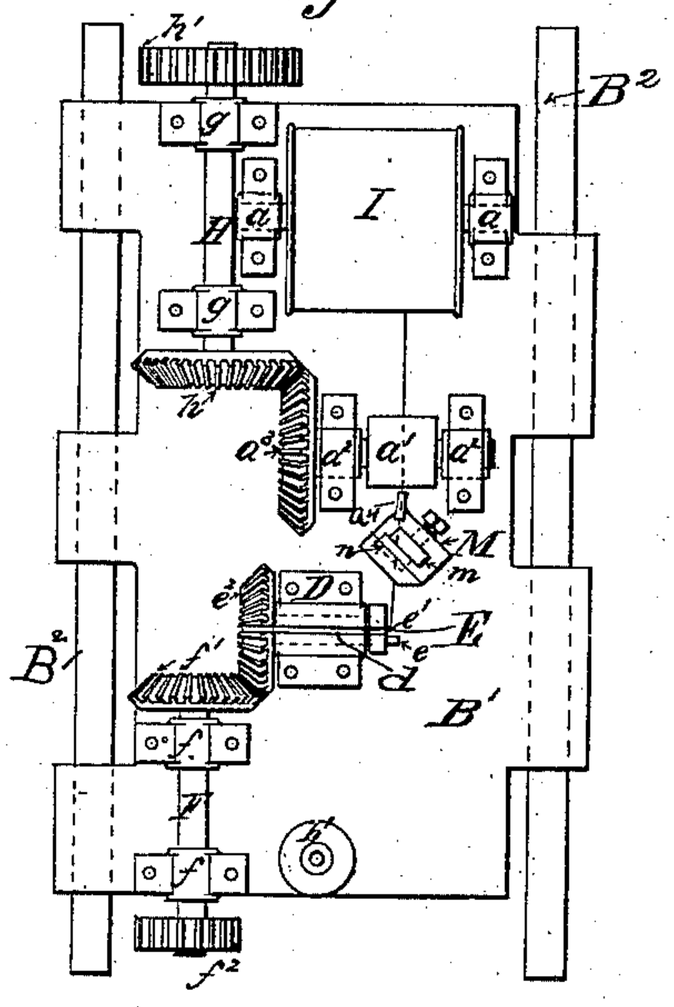


Fig. 4.

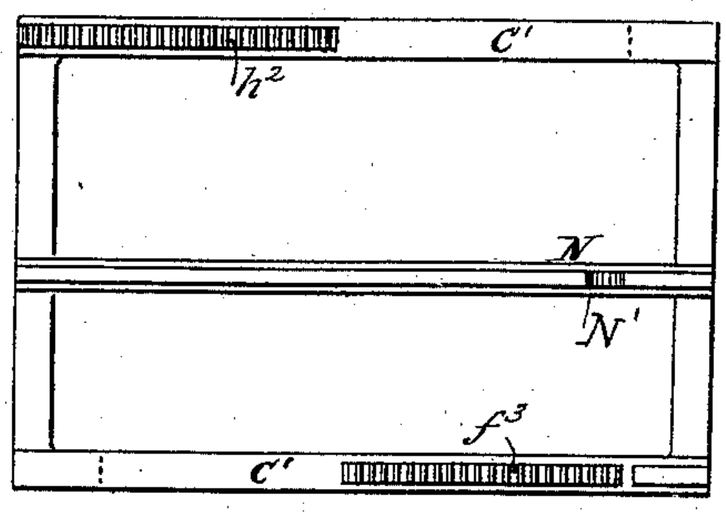
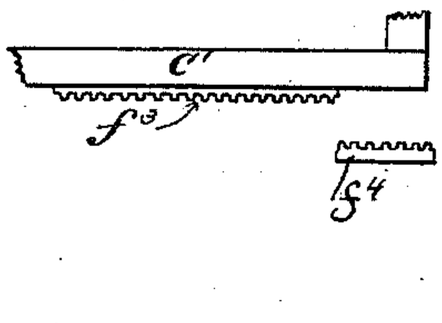


Fig. 5.



Witnesses
Wm. A. Simonds.
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Inventor
Amasa C. Paul

UNITED STATES PATENT OFFICE.

AMASA C. PAUL, OF MINNEAPOLIS, MINNESOTA.

WIRE-BARBING MACHINE.

SPECIFICATION forming part of Letters Patent No. 316,909, dated April 28, 1885.

Application filed August 16, 1884. (No model.)

To all whom it may concern:

Be it known that I, AMASA C. PAUL, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Wire-Barbing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to that class of wire-barbing machines in which wire barbs are applied to continuously-moving main wires.

My invention consists, generally, in an organized machine having an endless sectional carrier, and means for supporting and moving it, each section of the carrier being provided with means for feeding the barb-wire, means for coiling its free end about the main wire, and means for severing the completed barb.

My invention also consists in certain combinations hereinafter described, and pointed out in the claims.

By this machine two main wires moving continuously in opposite directions are simultaneously barbed.

In the accompanying drawings, Figure 1 is a plan of the machine. Fig. 2 is a vertical cross-section on line *x x*, Fig. 1. Fig. 3 is a side elevation of one of the sections of the carrier. Fig. 4 is a side elevation of the frame of the machine. Fig. 5 is a detail.

In the drawings, A represents the bed of the machine, and A′ A′ the supporting-frame. The bed may be a solid plate or an open frame supported in any suitable manner.

At each end of the machine is an upright shaft, P, supported in suitable bearings in the frame A′ A′, and each carrying two sprocket-wheels, P′ P′. One shaft, P, is provided with a belt-pulley or gear-wheel, (not shown,) and receives power from any convenient motor.

B is an endless sectional carrier composed of a number of sections, B′, secured together by hinge-joints, the rods B^2 forming the pintles of the hinge-joints. These rods extend beyond the upper and lower edges of the sections, and travel between the longitudinal guide-rails C C′, which are supported at the top and bottom of the supporting-frame A′ A′. The ends of the rods B^2 also enter the notches *p p* in the sprocket-wheels P′ P′, and by the rotation of shaft P and sprocket-wheels P′ P′ the carrier is moved. Each section of the carrier is preferably provided with two or more rollers, *b b′*, which travel on the upper surface of the lower bars, C C′, thereby lessening the friction between the carrier and its supporting-bars. Each section of the carrier thus becomes a carriage traveling on the lower bars, C C′, around the machine. The several sections of the carrier are alike in construction, and therefore a description of one section is all that is necessary. The base B′ of the section upon which the operating devices are mounted may be of any suitable construction.

D is the bearing for the coiling-spindle. It is secured to the base B′, and has a slot, *d*, in its outer side.

E is the coiling-spindle. It is a cylinder mounted to revolve freely in the bearing D, and having a longitudinal slot, *e′*, extending to its center. At its forward end it is provided with a coiling-nib, *e*, and at its rear end with a bevel-pinion, e^2. A shaft, F, is journaled in bearings *f f*, secured to the base of the section. The upper end of the shaft F carries a bevel-pinion, *f′*, which meshes with the pinion e^2 on the coiler. The lower end of the shaft F carries a pinion, f^2, which in one portion of the travel of the section comes in contact with a stationary rack-bar, f^3, supported on the bar C′. By this means the coiler is rotated at the proper time to coil the free end of the barb about the main wire.

The spool of barbing-wire I is supported on the section in bearings *a a*. The feed-rolls *a′ a′* are journaled in bearings a^2 a^2.

The shaft of the outer roll carries a bevel-pinion, a^3. This pinion gears with a pinion, *h*, carried by a shaft, H. The shaft H is journaled in suitable bearings, *g g*, on the base of the section. At its upper end shaft H carries the gear-pinion *h′*. This pinion is rotated by the fixed rack-bar h^2, with which it engages at the proper time to feed the barbing-wire a sufficient distance to form a barb. The rack-bar h^2 is supported on the upper rail, C′.

A standard, M, secured to the section, supports the fixed knife *m* and the movable knife *n*. The inner knife moves in ways in the face of the standard. It shears by the fixed knife, and so cuts the barb off obliquely, thus forming the sharp points in the usual manner. The inner end of the knife-bar *n* carries a friction-roller, *n′*. This roller runs on the track-bar N,

and is held down against the track-bar by a spring, n^3. At the point in the travel of the section at which the wire should be cut an elevation, N′, Fig. 4, on the track-bar moves the knife n, which severs the barb.

The feed-wheels for the barb-wire may be so located as to feed the barb-wire to the coiler at an angle to the face of the coiler, or a guide-tube, a^4, Fig. 3, for the barb-wire may be used to secure the same result.

A main wire, Q, upon each side of the machine is fed continuously by feed-rolls I. The wires travel at the same speed as the endless carrier.

After the barbs are applied each wire is passed to a suitable twister and spooler, where it is twisted with a plain wire, Q′, and spooled; or it may be spooled without being twisted with the plain wire.

The operation of the machine is as follows: The sprocket-wheels P′ P′ are rotated, moving the carrier continuously. The main wires are also moved continuously by the feed-rolls I I. Each section of the carrier passes around the end of the machine, and as it leaves the sprocket-wheel the slot in the coiler takes over the main wire, so that the wire lies in the center of the coiler. The barb-feed is operated and the free end of the barb-wire passes inside the main wire and outside the coiling-nib. The coiler is then rotated, and its nib engaging the free end of the wire wraps it around the main wire the desired number of times. The inner knife is then moved and the barb is severed. As the section arrives at the end of the machine it passes around the sprocket-wheel, leaving the main wire, which passes onto the twister. The section is moved to the other side of the machine. It there takes onto the other main wire, and as it travels along this side of the machine applies a barb, as before. Each section operates in the same way. The distance between any two barbs will equal the distance from the face of one coiler to the face of the next.

In order that the points of the finished barbs may extend from the main wire in opposite directions, the coiler should be rotated more than one or two complete revolutions—that is, about one and one-fourth or two and one-fourth revolutions. It is then necessary to give the coiler a one-fourth turn in reversal, in order that the slot in the coiler and the slot in its bearing may coincide when the section reaches the point in its travel at which it begins to move away from the main wire. This partial turn in reversal may be obtained by a short rack-bar, f^4, (see Fig. 5,) supported from the frame of the machine and placed near the end of the frame and facing in the opposite direction to the rack-bar f^3.

I do not limit myself to any particular number of sections. I have shown a carrier comprising twelve sections; but more may be found desirable in most instances.

Any suitable devices may be used in connection with the shafts F and H to keep them from rotating during the portion of the travel of the section when their pinions are not in engagement with the rack-bars.

I have shown and described my machine as an upright machine; but it is obvious that without reorganization it may be made into a horizontal machine—that is, one in which the sections will, when in operation, travel in horizontal planes.

I claim as my invention—

1. In a wire-barbing machine, an endless sectional carrier, each section provided with means for feeding a barb-wire, means for coiling its free end about a main wire, and means for severing the completed barb, in combination with means for supporting and moving the carrier, and means for operating the barb feeding, coiling, and cutting devices, all substantially as described.

2. In a wire-barbing machine, means for supporting and feeding continuously one or more main wires, an endless sectional carrier, and means for supporting and moving it continuously, each section of the carrier being provided with means for supporting a reel of barb-wire, means for feeding the barb-wire, means for coiling the free end of the barb-wire around the main wire, and means for severing the completed barb, all combined and operating substantially as described.

3. In a wire-barbing machine, the combination of the endless sectional carrier, each section provided with means for feeding, coiling, and cutting the barbs, with means supported on the frame of the machine for operating the feeding, coiling, and cutting devices, substantially as described.

4. The combination, with means for moving two main wires continuously in opposite directions, of the jointed endless carrier, each section provided with barb forming and applying devices, as described, and the shafts and sprocket-wheels for moving the carrier, whereby the two main wires may be simultaneously barbed, substantially as described.

5. The combination, with the jointed carrier B, provided with the barb-applying devices, of the guide-rails C C′, the rack-bars h^2 f^3, the track-bar N, and the shafts P P and sprocket-wheels P′ P′, all substantially as described.

6. In a wire-barbing machine, the section B′, having the slotted bearing D and the longitudinally-slotted coiling-spindle E, the slotted gear e^2, the gear f', the shaft F, and gear f^2, all substantially as described.

7. In a wire-barbing machine, the jointed carrier B, each section provided with the slotted bearing D, the longitudinally-slotted coiling-spindle E, the feed-rolls a' a', and the cutters m n, all arranged and operating substantially as described, and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

AMASA C. PAUL.

Witnesses:
ELVETUS A. PRATT,
WM. A. SIMONS.