

(No Model.)

4 Sheets—Sheet 1.

D. C. STOVER.
WIRE BARBING MACHINE.

No. 295,208.

Patented Mar. 18, 1884.

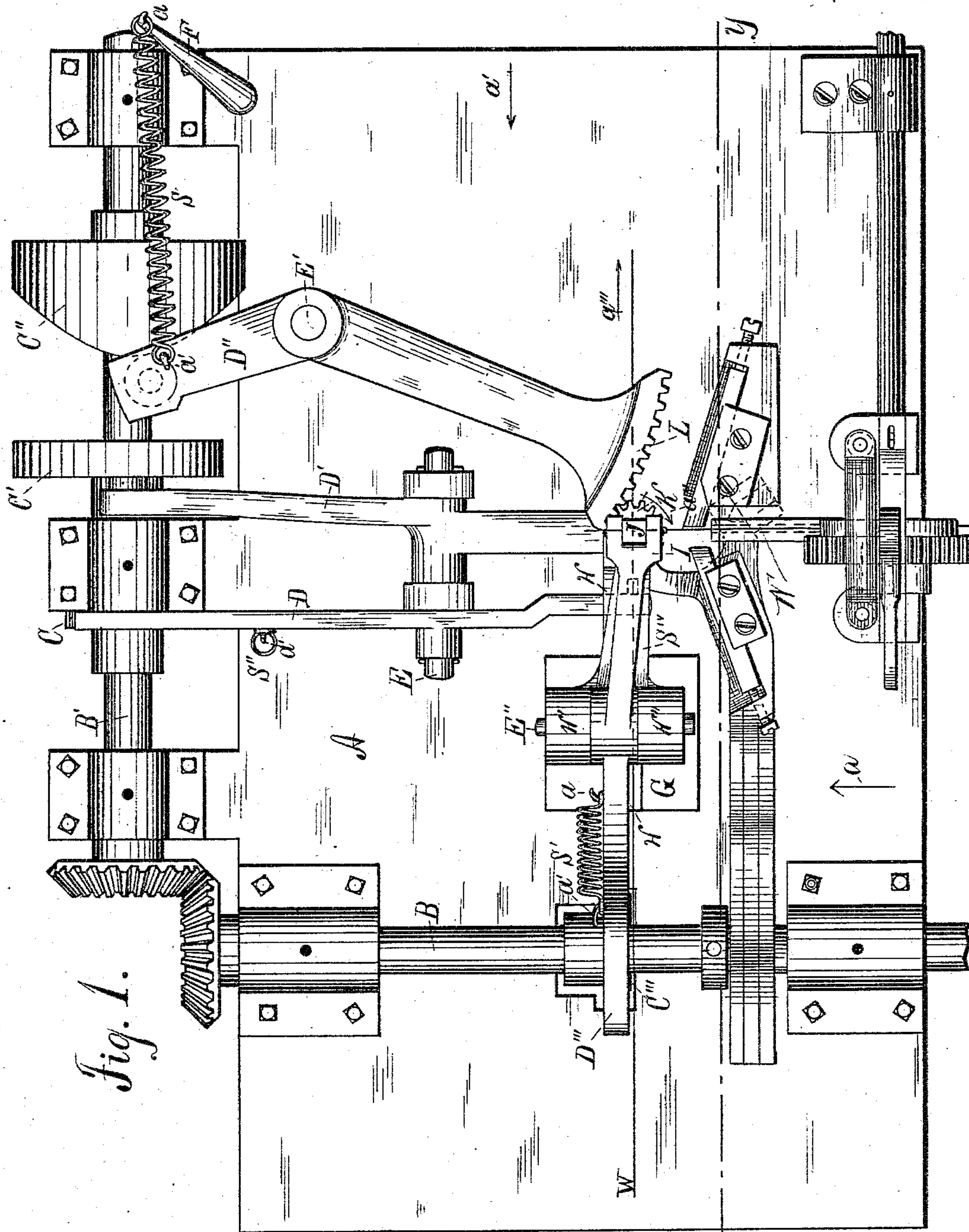


Fig. 1.

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Wallace Greene.

INVENTOR

Daniel C. Stover
by Root & Wiles
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(No Model.)

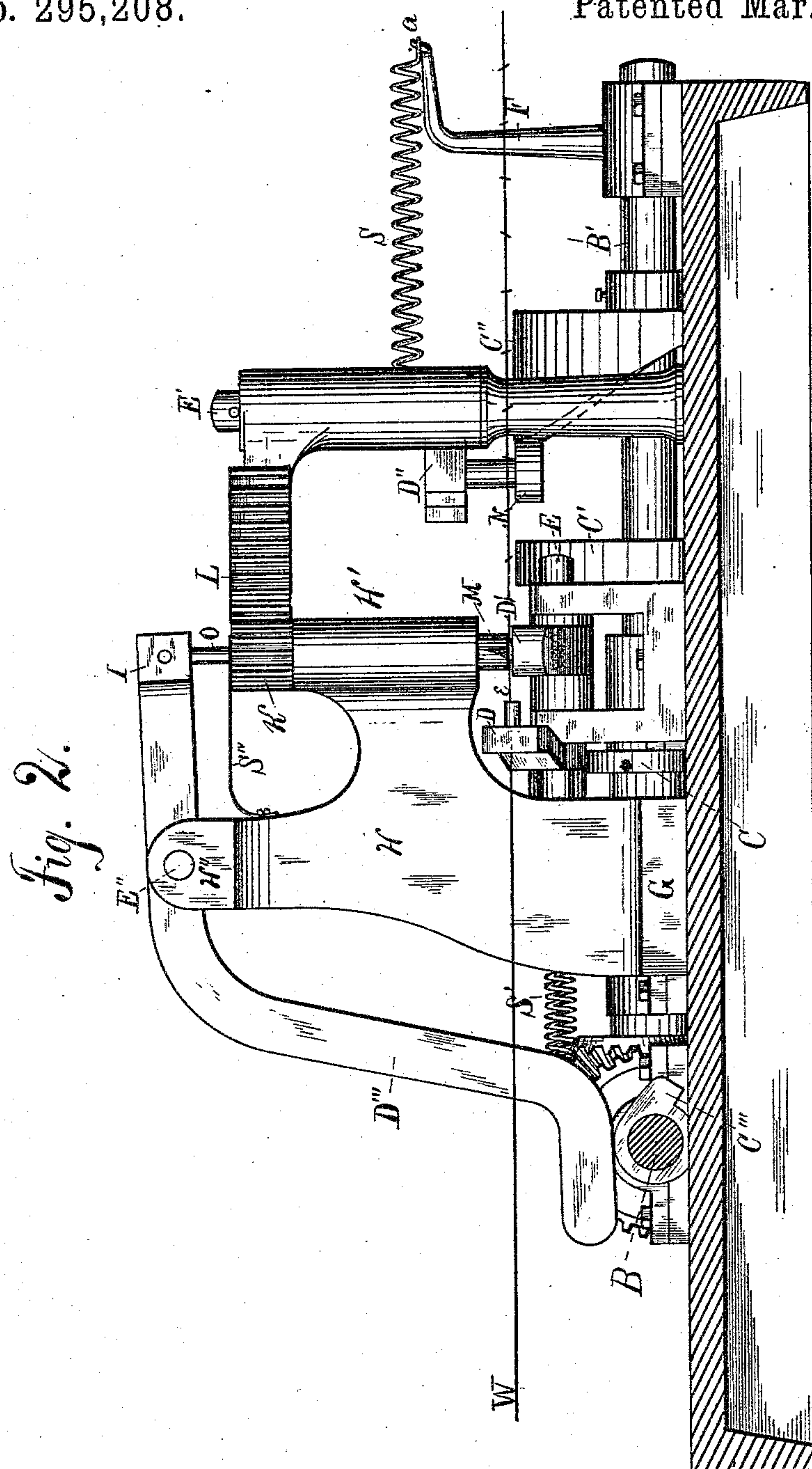
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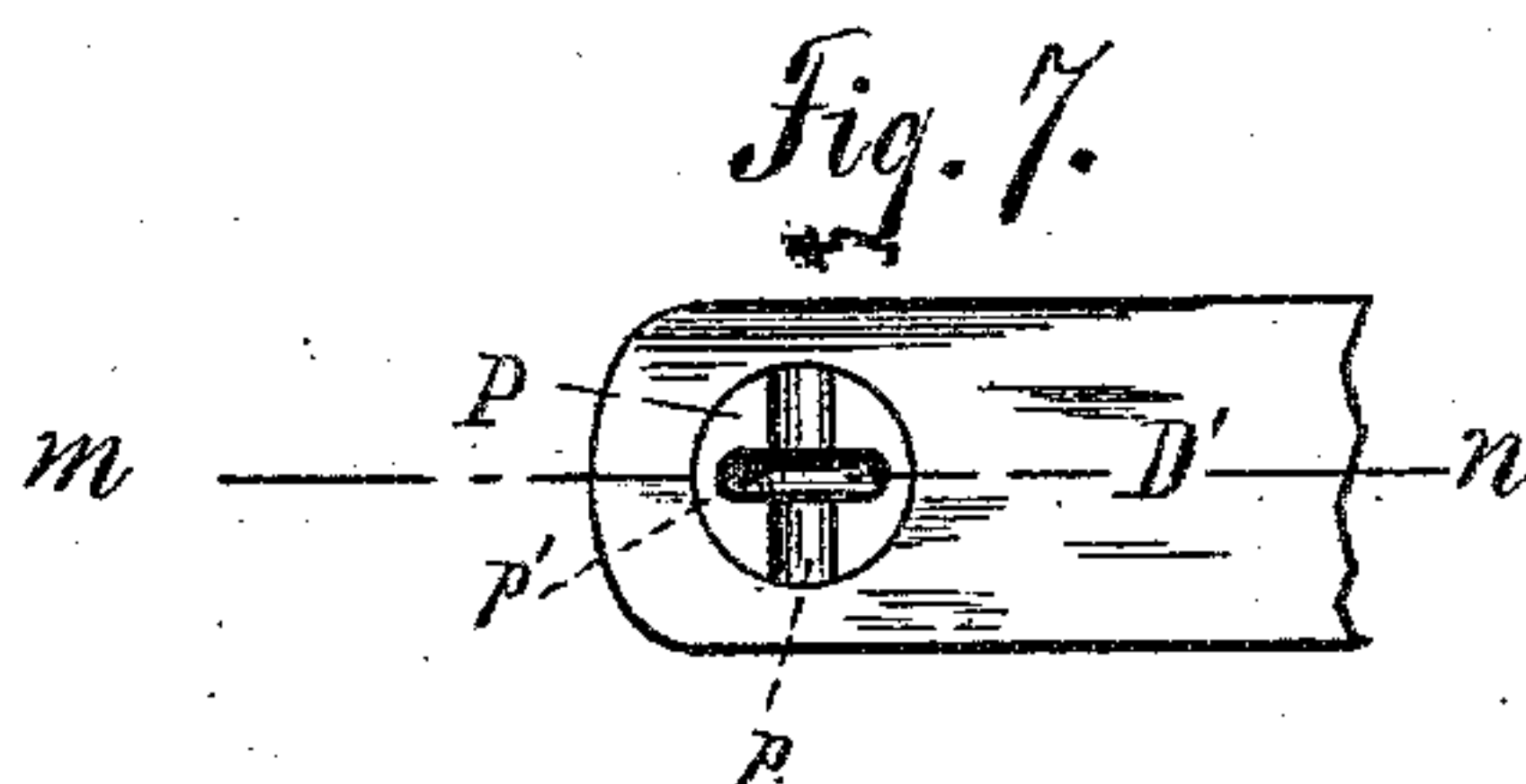
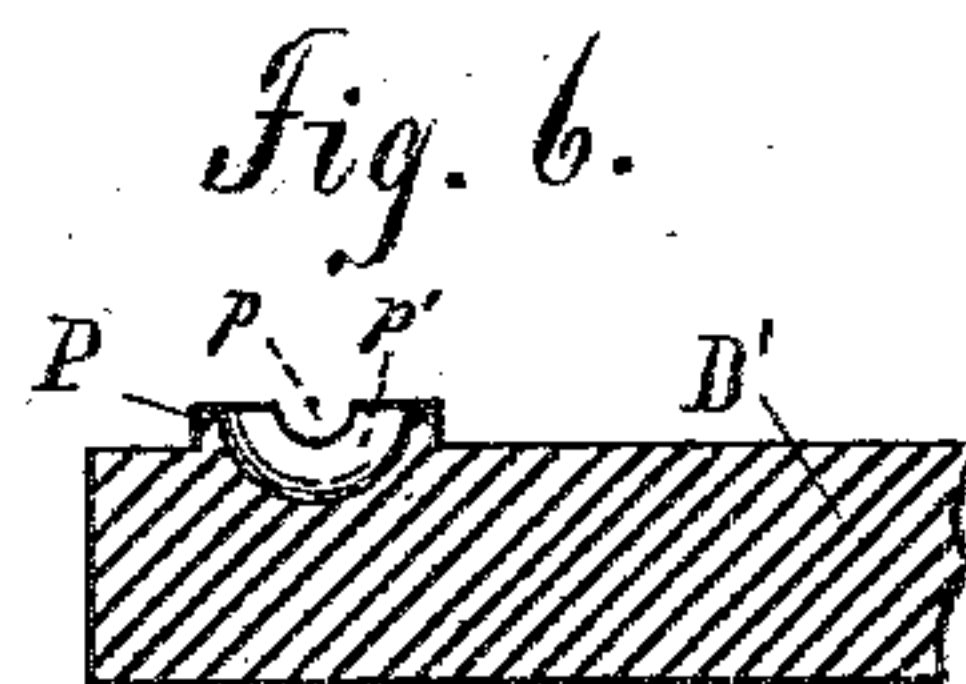
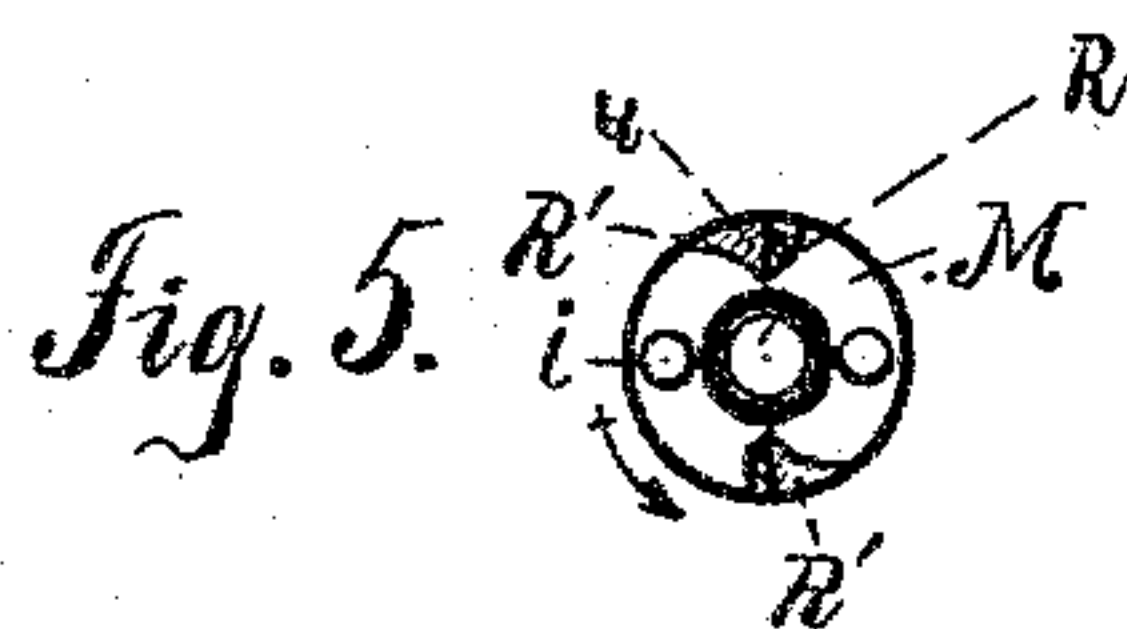
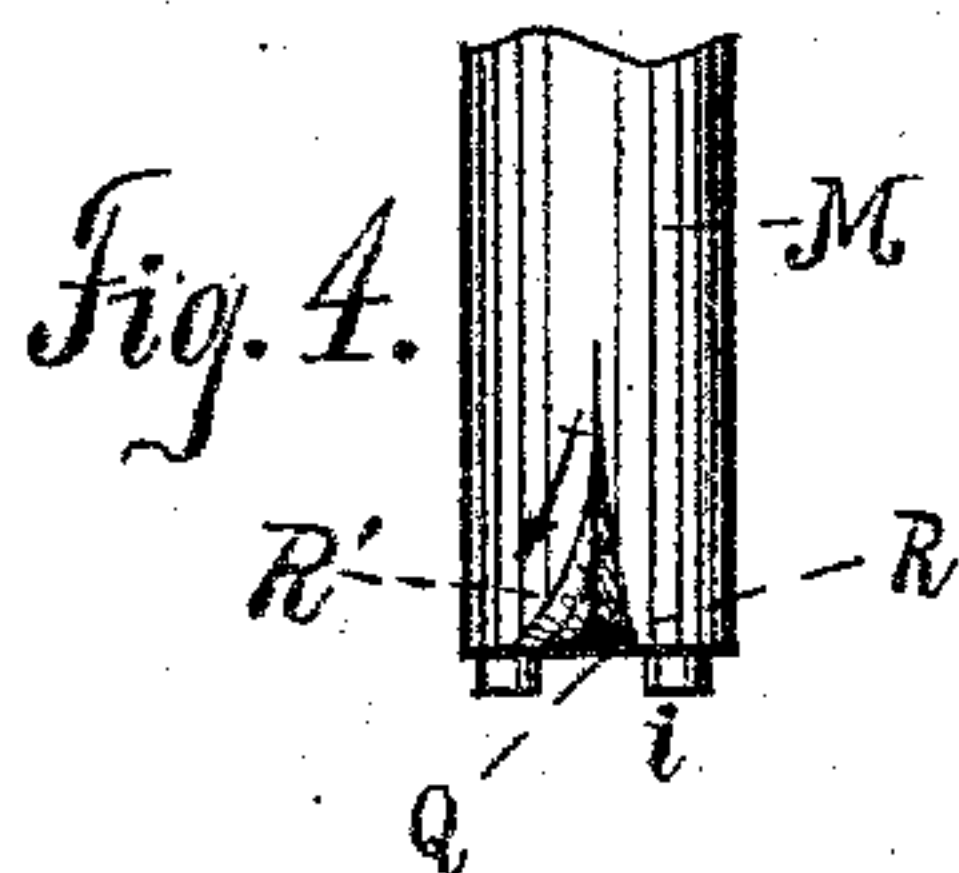
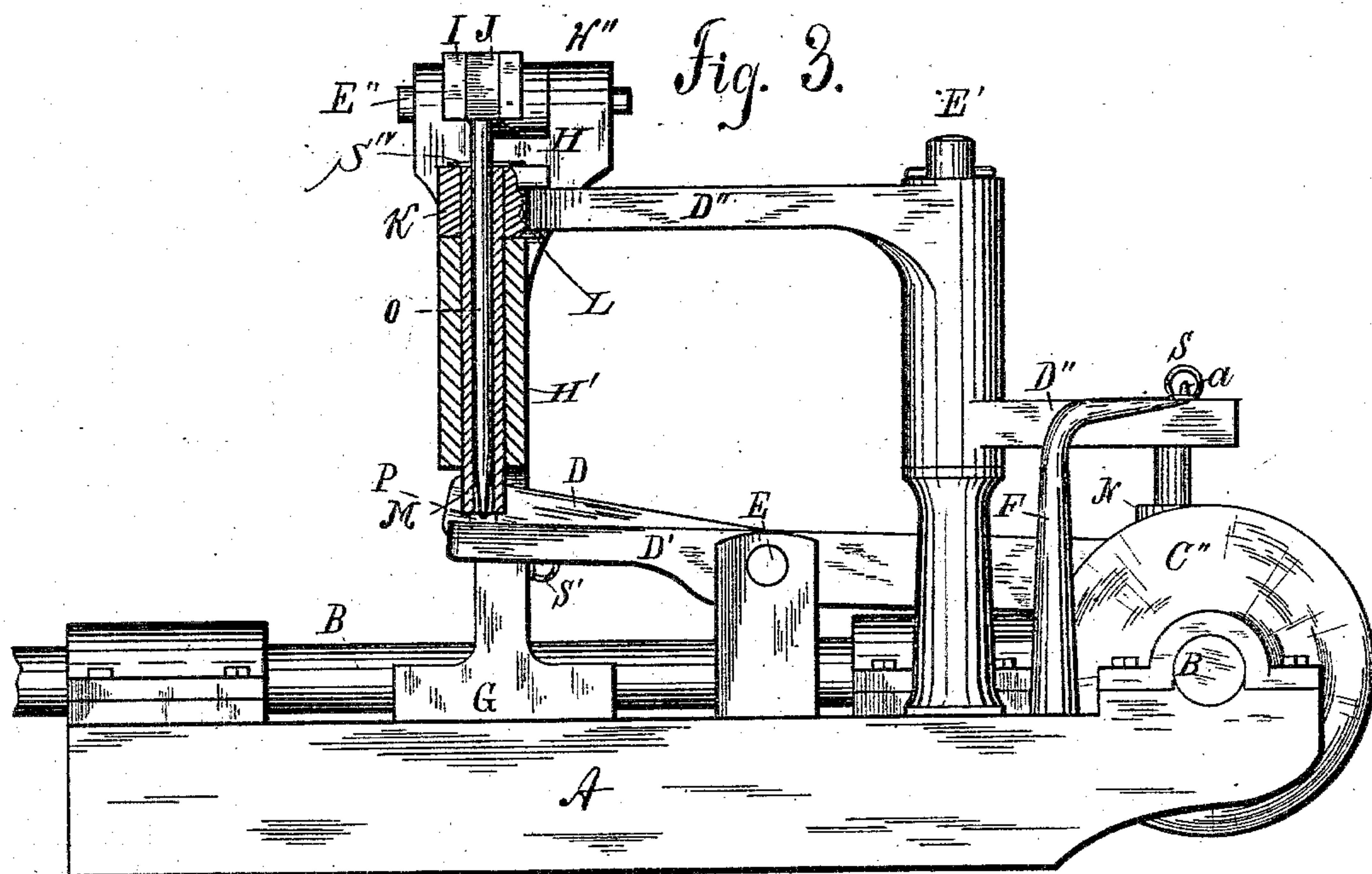
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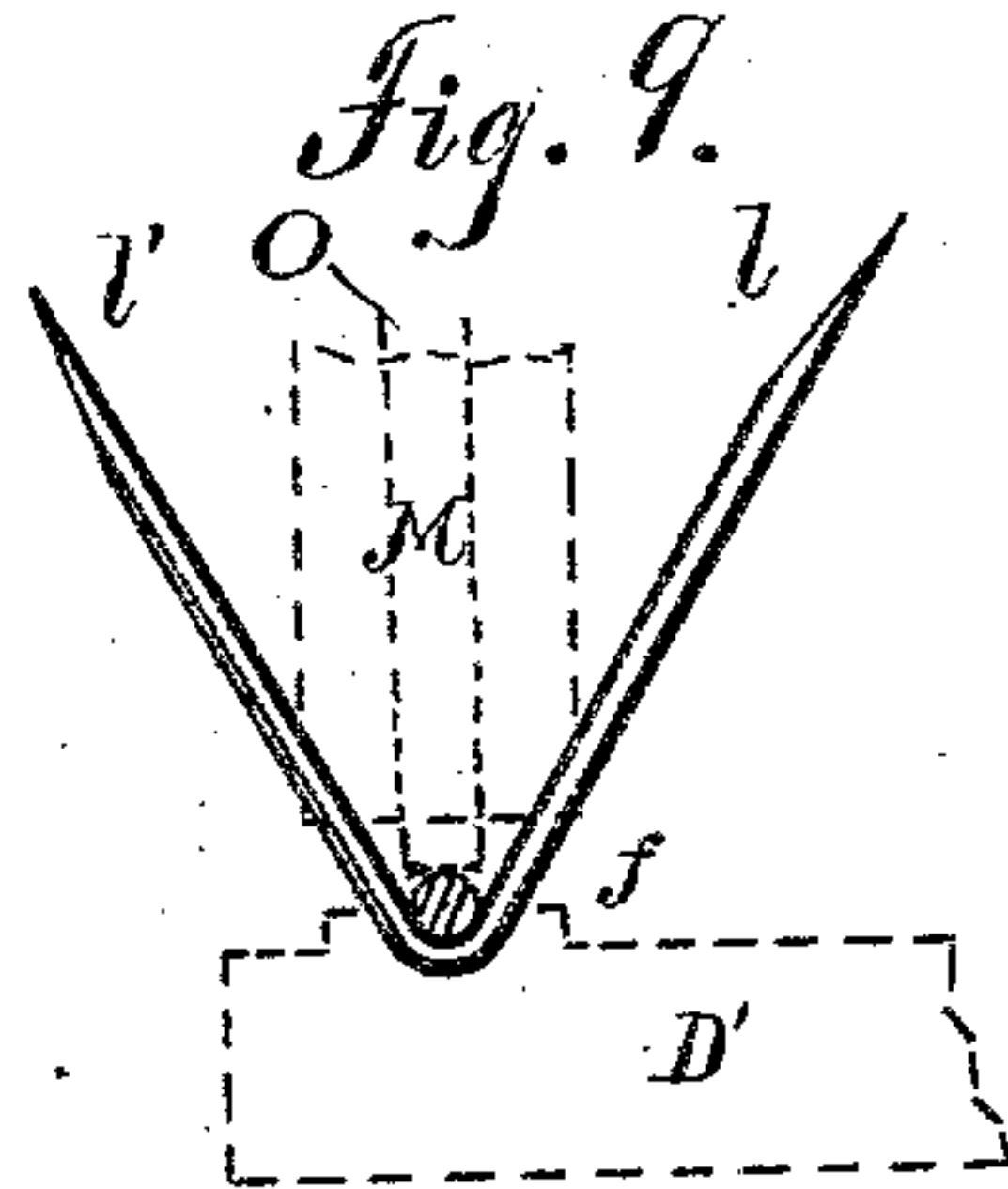
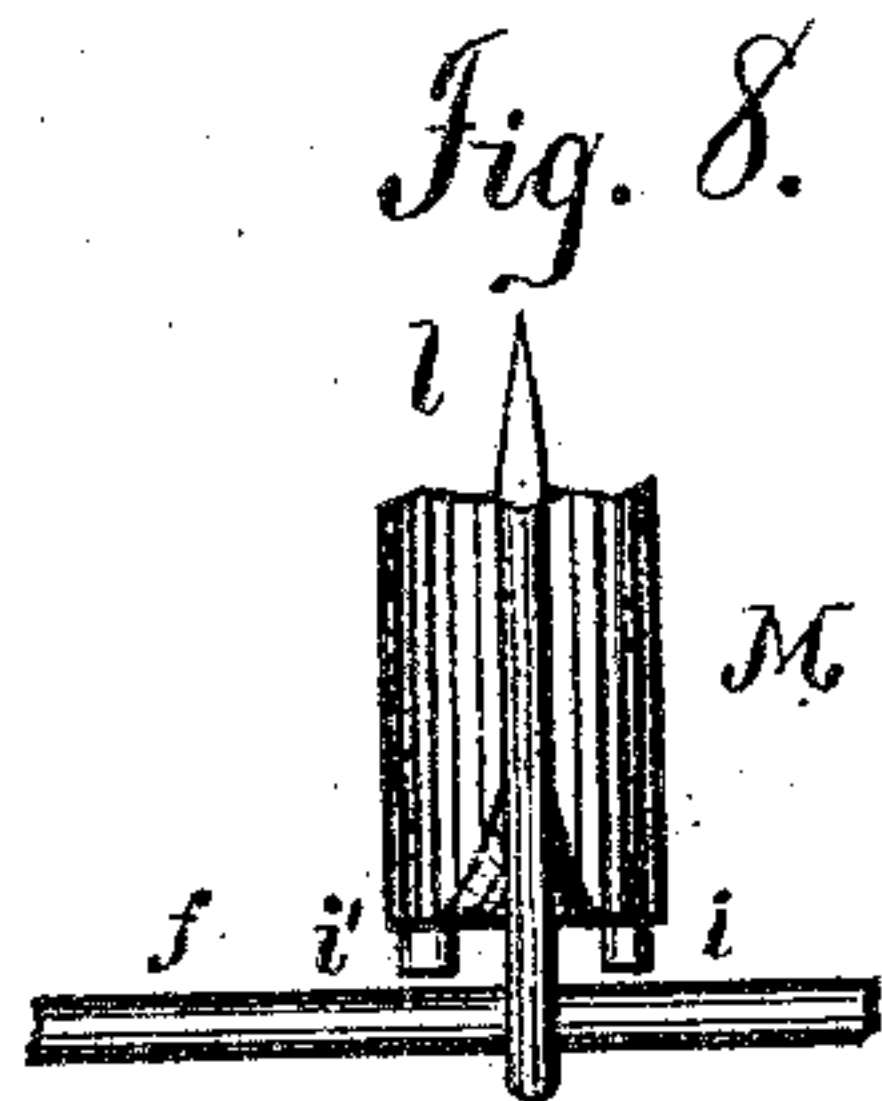


Fig. 10.

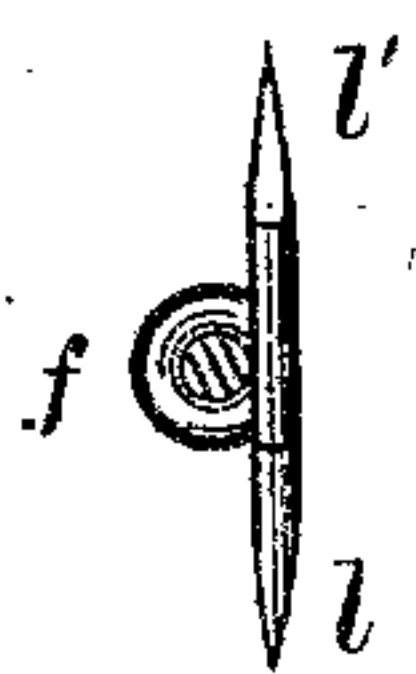


Fig. 11.

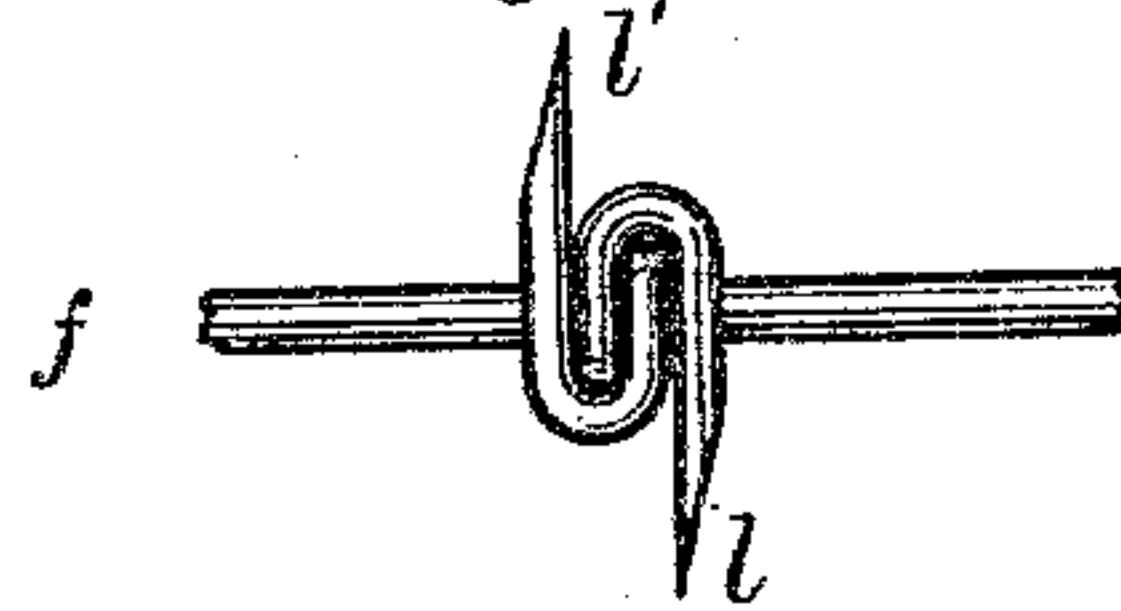


Fig. 12.

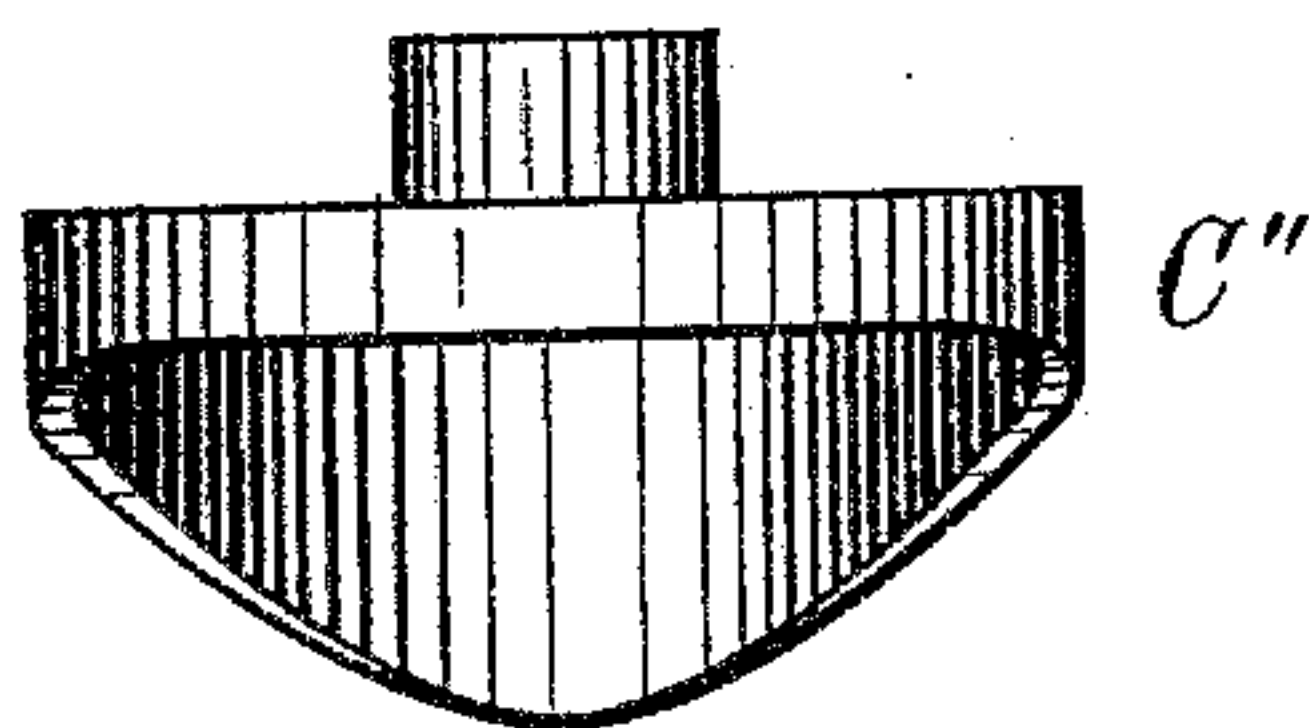


Fig. 13.

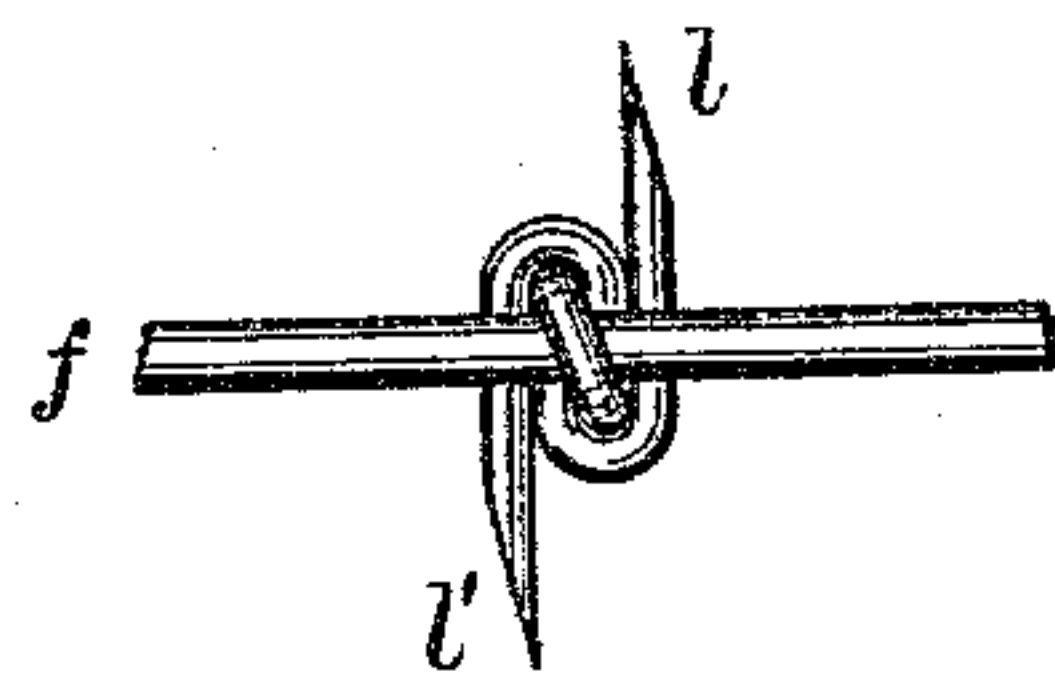


Fig. 14.

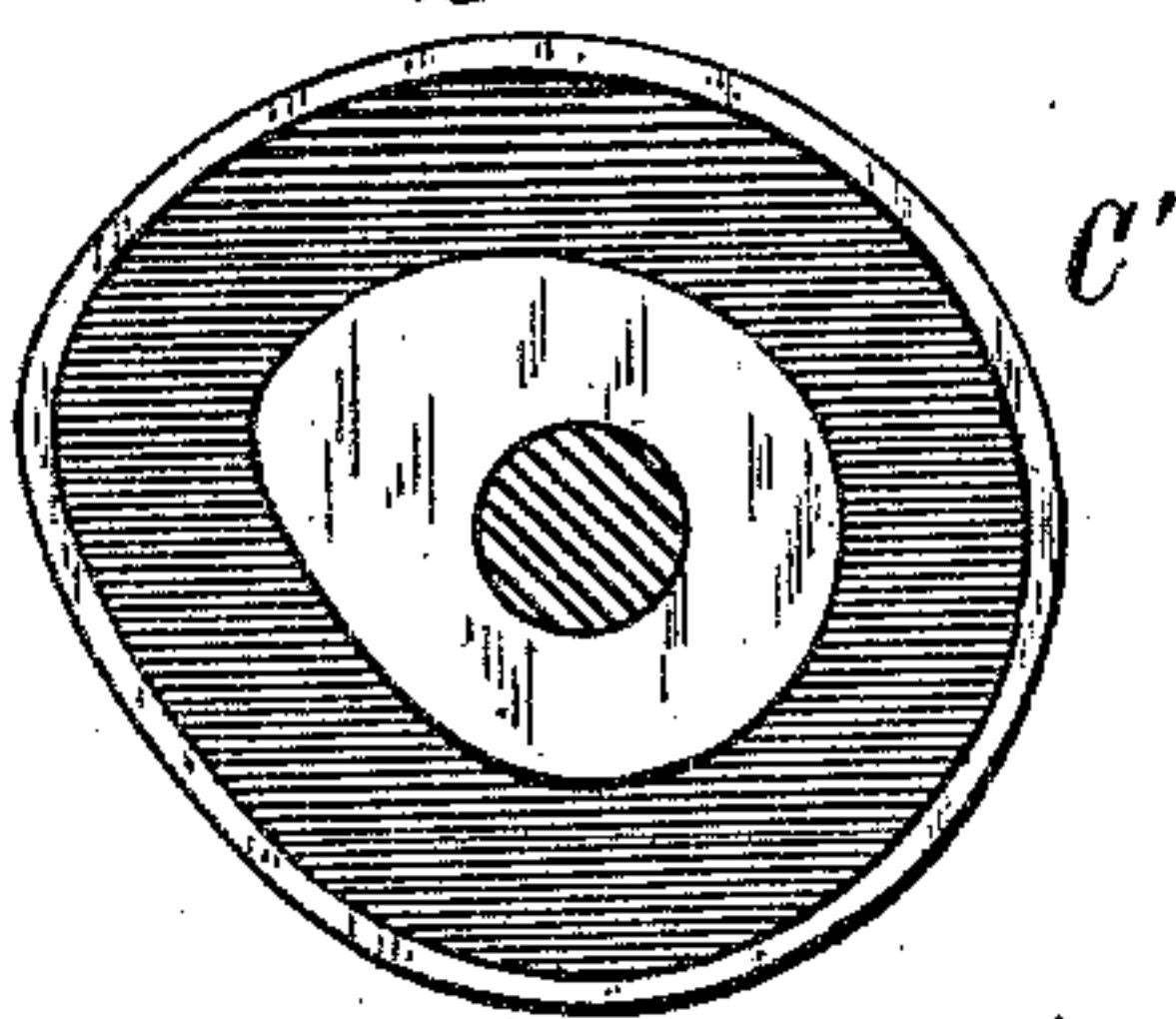
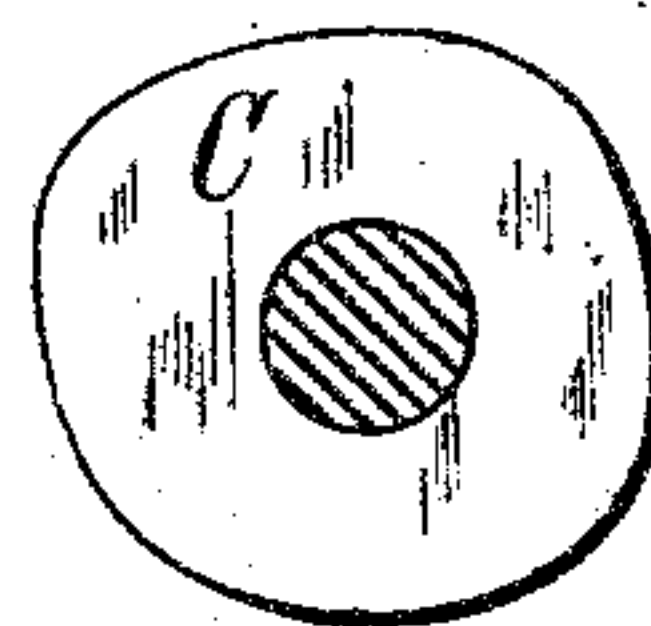


Fig. 15.



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UNITED STATES PATENT OFFICE.

DANIEL C. STOVER, OF FREEPORT, ASSIGNOR TO HIRAM ELLWOOD, OF DE KALB, ILLINOIS.

WIRE-BARBING MACHINE.

SPECIFICATION forming part of Letters Patent No. 295,208, dated March 18, 1884.

Application filed November 12, 1883. (No model.)

To all whom it may concern:

Be it known that I, DANIEL C. STOVER, a resident of Freeport, in the county of Stephenson and State of Illinois, 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 pertains to make and use the same.

My invention is an improved machine for applying barbs to a single wire, the wire so barbed being adapted for use as a single-strand fencing material, or for intertwisting with a second wire, either plain or barbed, to form a two-strand cable.

The machine is fully described, explained, and claimed in the following specification, and shown in the accompanying drawings, in which—

Figure 1 is a plan of the entire machine; Fig. 2, a side elevation thereof, looking in the direction indicated by the arrow *a*, Fig. 1, the bed of the machine being cut away by a vertical plane passing through the line *xy*, Fig. 1; Fig. 3, an end view of the machine, looking in the direction indicated by the arrow *a'*, Fig. 1; Fig. 4, an enlarged elevation of the barb-forming sleeve *M*; Fig. 5, a bottom view of same; Fig. 6, a vertical section, and Fig. 7 a plan, of the inner end of the lever *D'*, the plane of section in Fig. 6 passing through the line *m n*, Fig. 7; Fig. 8, a front elevation of the sleeve *M*, showing the main wire and barb-wire in position after the latter has been bent into a staple; Fig. 9, a side elevation of the barb-wire bent into a staple, the positions of the sleeve *M* and lever *D'* being shown in dotted lines; Figs. 10, 11, and 13, views of the completed barb; and Figs. 12, 14, and 15, views showing the forms of the cams *C C' C''*.

In all the general views of the machine, except Fig. 1, the devices for feeding and severing the barb-wire are omitted.

In these views, *A* is the bed of the machine; *B*, the main shaft thereof, and *B'* a side shaft connected with the main shaft by miter-gears.

Near the middle of the bed is a vertical column, *H*, formed integrally with a base, *G*, and

with a vertical cylindrical bearing, *H'*, the base *G* being rigidly fastened to the bed.

In the bearing *H'* is journaled a sleeve, *M*, on which is rigidly mounted, immediately above the bearing *H'*, a pinion, *K*, and within the sleeve moves vertically a punch, *O*. The head *J* of the punch *O* is pivoted in the bifurcated end *I* of a bent lever, *D'''*, which oscillates vertically about a horizontal pivot, *E''*, passing through the lever and through two ears, *H''*, at the summit of the column *H*. The rear end of the lever *D'''* rests on a cam, *C''*, mounted on the shaft *B*, the contact of the lever and cam being preserved by a spring, *S'*, one end of which is attached to the lever, while the other end is fastened to the column *H*. The rotation of the shaft *B* and cam *C'''* alternately raises and lowers the end of the lever *D'''*, and thus imparts reciprocal vertical motion to the punch *O*. A spring, *S''*, attached to the column *H*, rests on the pinion *K*, and prevents any vertical motion or jar of the sleeve *M*. The pinion *K* engages with a horizontally-oscillating geared segment, *L*, which is formed integrally with a lever, *D''*. The lever is pivoted near its middle on a vertical post, *E'*, which is rigidly fastened to the bed of the machine, and the outer free end of the lever carries an anti-friction roller, *N*, which rests against the edge of a cam, *C'*, rigidly mounted on the shaft *B'*. The contact of the roller and cam is maintained by a spring, *S*, one end of which is fastened to the free end of the lever *D''* and the other end to a stationary post, *F*, and the rotation of the cam *C'* imparts reciprocal horizontal motion to the lever *D''*, and segment *L* and reciprocal rotary motion to the sleeve *M*.

In front of the supporting-column *H*, heretofore referred to, are two horizontal levers, *D D'*, very nearly at right angles to the shaft *B'*. Both these levers are pivoted on a horizontal shaft, *E*, supported by suitable stationary bearings attached to the bed *A*. The outer ends of these levers receive reciprocal vertical motion from the cams *C C'*, respectively, both of said cams being rigidly mounted on the shaft *B'*. The lever *D* is held in contact with the periphery of the cam *C* by a spring, *S'*,

fastened to the lever and to the bed of the machine, while the lever D' is provided with a pin projecting from its side face and entering a groove in the side face of the cam C' . The forms of the cams C'' C' C are fully shown in Figs. 12, 14, and 15, respectively. The lever D extends from the cam C at one side of the machine to a point slightly beyond the column H , and is provided at its inner end with a horizontal spindle, e , projecting from its front face, both lever and spindle being drilled in a line coincident with the axis of the spindle for the passage and support of the main wire to be barbed. The lever D' is of practically the same length as the lever D , and is provided near its inner end with a raised face, P , forming part of the upper surface of the lever, and so placed as to lie directly under the sleeve M and punch O . The face P is cut by a diametrical groove, p , parallel with the shaft B' , and in the line of the main wire w , and in this groove the main wire rests during the operation of intertwisting the ends of the barb, as hereinafter set forth.

At right angles to the groove p is a vertical recess, p' , of such form and dimensions as to receive the middle of a barb when bent about the main wire in the form of a staple. (See Figs. 6, 7, and 9.)

The periphery of the sleeve M is cut by two vertical tapering notches, Q Q , widest and deepest at the base or bottom of the sleeve, and tapering gradually upward, as shown in Figs. 4 and 5. Each of the notches has two lips, R R' , the lip R being short, nearly radial, and preferably somewhat concave, while the lip R' is longer and slightly convex, and forms a cam about which the end of the barb may slip without obstruction. The lower face of the spindle M is provided with two wrapping lugs or pins, i , diametrically opposite each other, and placed midway between the notches Q Q .

From the foregoing description and explanation of the parts of the machine it appears that the rotation of the shafts B B' and the cams mounted thereon imparts reciprocal rotary motion to the sleeve M , reciprocal vertical motion to the punch O , and reciprocal vertical motion to the levers D D' , and that these motions are independent of each other. It is further evident that the various cams may be so timed as to produce these motions of the different parts in any desired order and at any desired intervals within the limits of the time required for a revolution of the main shaft. The manner in which these movements of the parts co-operate in the formation of a barb is as follows: The main wire w being in the position shown in Figs. 1 and 2, the punch O and the inner end of the lever D , with its wire-supporting-spindle e , are raised to their highest positions, respectively, while the inner end of the lever D' is dropped to its lowest position, the main wire being thus freed wholly from the face P of the lever D' . While the main wire is in this position the barb-wire w'

is fed from the side of the machine opposite the shaft B' , between the face P and the main wire, at right angles to the latter, and immediately over the recess p' , the position of the barb wire being shown in Fig. 1. Immediately after the feeding in of the barb-wire, the face P is raised until it strikes the pins i of the sleeve M , and the supporting-spindle e is lowered until it is in line with the groove p ; and at the same time the punch O descends upon the main wire and forces it into the groove. At the instant when the punch O reaches the main wire, the barb is severed by suitable knives situated between the main wire and the barb-feeding mechanism. The main wire rests on the center of the severed barb, which lies over the recess p' , and the downward pressure of the punch O on the main wire bends the middle of the barb downward into the recess, while its ends move upward, the barb taking the form of a staple whose legs are nearly at right angles to each other, and forty-five degrees above a horizontal line, and the legs when at their highest position being received by the notches in the sleeve M . (See Figs. 8 and 9.) The sleeve M is now revolved in the direction indicated by the arrow in Fig. 5, and by the arrow a'' in Fig. 1, the short concave lips R of the notches Q Q pressing laterally against the legs of the staple and tending to rotate them about their common center and intertwist them. As the sleeve rotates, each of the legs moves downward over the convex face R' of the notch in which it lies, (the direction of its motion being indicated by the arrow in Fig. 4,) until, when the sleeve has rotated about one hundred and eighty degrees, the leg reaches the bottom of the convex face and falls into a horizontal plane. The legs are now caught by the wrapping-pins i , and the rotation of the sleeve continues until it has completed an entire revolution of three hundred and sixty degrees, when the barb has the form shown in Figs. 10, 11, and 13, the inter-twisted legs lying wholly in the same plane and forming a flat central rosette, from which the points project in tangent lines. The punch O , which at the beginning of the rotation of the sleeve M rests on the main wire, is raised as soon as the sleeve brings the legs of the staple sufficiently across the main wire to hold the latter in place. This is necessary, in order that the legs, when intertwisted, may lie in close contact. Were the punch to rest on the main wire during the entire rotation of the sleeve M , the rosette formed by the inter-twisted legs of the barb would have a central opening of a diameter equal to that of the lower end of the punch. The barb being brought to the completed form shown in Figs. 10, 11, and 13, the supporting-spindle e is raised and the face P is dropped until the barb and main wire are wholly free from the face. The main wire is then fed forward in the direction indicated by the arrow a''' , Fig.

1, when the machine is ready for the feeding and forming of another barb, the feed of the main wire being, of course, through a space equal to the desired distance between two contiguous barbs on the main wire.

The punch O, instead of being separate from the sleeve M, may be formed integrally with it, and project below its lower face a distance about equal to the diameter of the barb-wire. In this case, however, the entire sleeve and punch must have vertical as well as rotary motion, and the wrapping-pins *i* must move longitudinally in sockets in order to vary the distance they project below the face of the sleeve. I have found in practice that it is preferable to make the punch independent of the sleeve, as shown.

In the drawings no devices for feeding forward the main wire are shown, as any intermittent feed may be used.

The devices shown in Fig. 1 for feeding and cutting the barb-wire are substantially the same as are shown in my Patent No. 278,624, issued May 29, 1883; but any other equivalent devices may take the place of these without in any way affecting my invention.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a wire-barbing machine, the combination of means for supporting a main wire, means for feeding a barb-wire across said main wire, means for severing the barb-wire between the barb-feeding mechanism and the main wire, and means for wrapping the severed barb about the main wire and inter-twisting its ends, substantially as shown and described.

2. In a wire-barbing machine, the combination of means for supporting a main wire, means for feeding a barb-wire across said main wire, means for severing the barb-wire between the barb-feeding mechanism and the main wire, means for bending the severed barb into a staple having its legs on opposite sides of the main wire, and means for crossing and inter-twisting said legs, substantially as shown and described.

3. In a wire-barbing machine, the combination of means for supporting a main wire, means for forming a barbing-staple with its middle in contact with the main wire, and its legs on opposite sides thereof, and means for crossing said legs over the main wire and inter-twisting them in a flat coil from which the points of the barb project, substantially as shown and described.

4. In a wire-barbing machine, the combination of means for supporting a main wire, means for feeding a barb-wire across said main wire, means for severing the barb-wire between the feeding mechanism and the main wire, means for pressing the main wire against the middle of the severed barb, and bending it into a staple whose legs are on opposite sides of the main wire, and means for crossing

and inter-twisting the legs of the staple, substantially as shown and described.

5. In a wire-barbing machine, the combination of means for supporting a main wire, means for feeding a barb-wire across said main wire, means for severing the barb-wire between the feeding mechanism and the main wire, means for pressing the main wire against the middle of the severed barb and bending it into a staple having its legs on opposite sides of the main wire, a twisting-cylinder at right angles to the main wire, and provided with opposite longitudinal notches or recesses in its periphery adapted to receive the legs of the staple so formed, and means for rotating said twisting-cylinder, whereby the legs of the staple may be crossed and inter-twisted, substantially as shown and described.

6. In a wire-barbing machine, the combination of means for supporting a main wire, means for feeding a barb-wire across the main wire and severing the same, a longitudinally-reciprocating punch at right angles to the main wire, adapted to press the main wire against the middle of the severed barb and bend it into a staple having its legs on opposite sides of the main wire, a twisting-sleeve rotating freely about said punch, and provided with opposite notches in its periphery adapted to receive the legs of said staple, and means for rotating said sleeve, whereby said legs are crossed and inter-twisted, substantially as shown and described.

7. The combination, with means for supporting a main wire, and means for forming a barbing-staple having its middle in contact with the main wire and its legs on opposite sides thereof, of the rotating cylinder M, provided with notches Q Q, having lips R R', formed substantially as described, whereby the rotation of the cylinder crosses the legs of the staple, and at the same time brings them into the same plane, substantially as shown and described.

8. The combination of means for supporting a main wire, means for forming a barbing-staple having its middle in contact with the main wire and its legs on either side thereof, a twisting-cylinder, M, provided with notches Q Q in its periphery, and two pins, *i*, projecting below the lower face of said twisting-cylinder, said notches being adapted to receive the legs of the staple, partly inter-twist them, and bring them into the same plane, and said wrapping-pins to complete the inter-twisting of said legs, substantially as shown and described.

9. The combination of the sleeve M, punch O, moving freely within said sleeve, and pivoted lever D''' and cam C''', adapted to impart reciprocal motion to said punch, substantially as shown and described, and for the purpose set forth.

10. The combination of the levers D D', supporting-spindle *e*, attached to the lever D, the grooved face P, attached to the lever D',

and means, substantially as described, for imparting reciprocal vertical motion to said levers.

11. The combination of the punch O, sleeve
5 M, reciprocating lever D'', reciprocating segment L, pivoted reciprocating levers D D', and means, substantially as described, for imparting reciprocal motion to said levers and segment.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

DANIEL C. STOVER.

Witnesses:

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A. V. RICHARDS.