

(No Model.)

4 Sheets—Sheet 1.

F. PHILIPS.

MACHINE FOR BARBING AND WINDING WIRE.

No. 366,245.

Patented July 12, 1887.

Fig. 1.

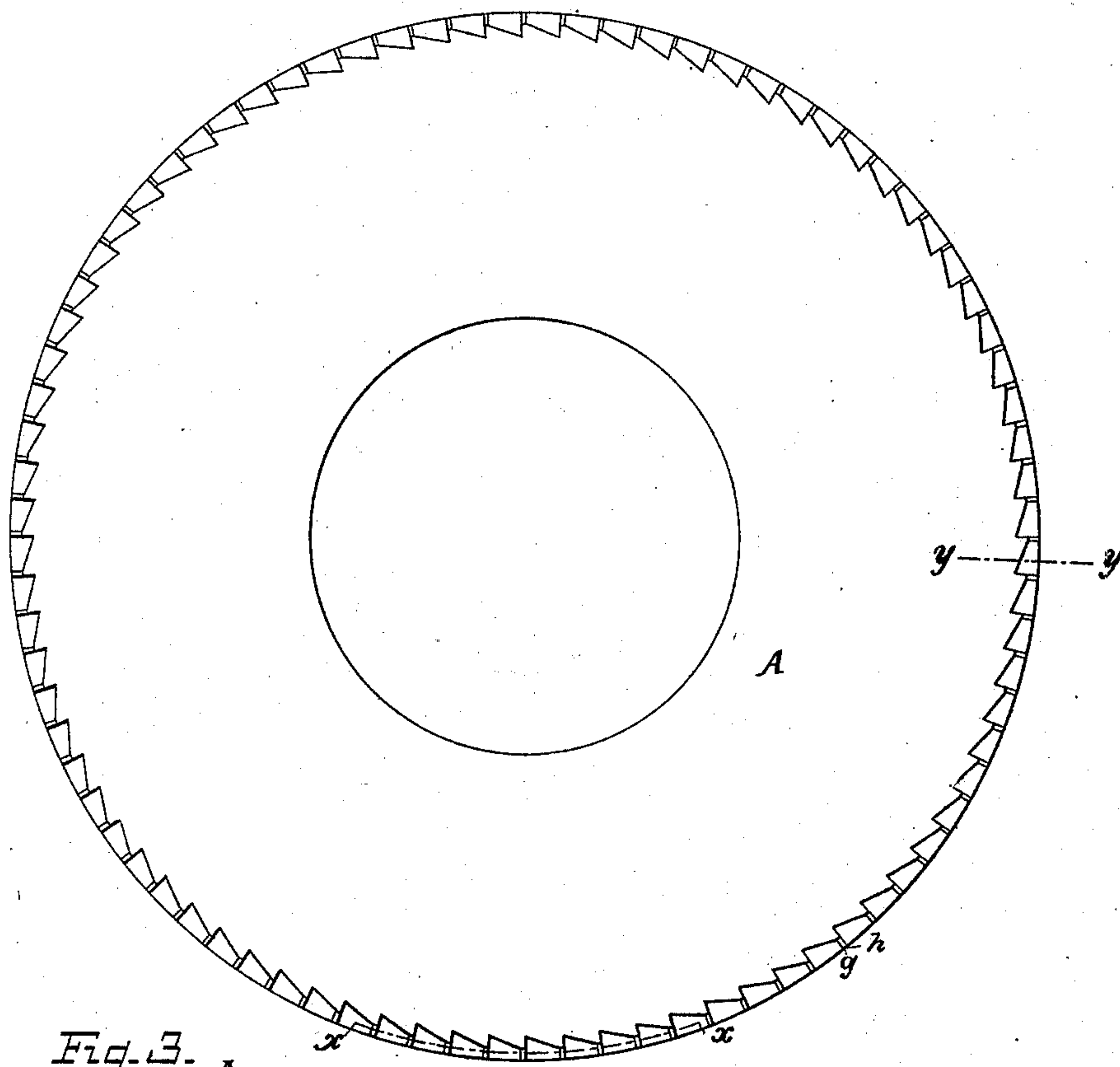


Fig. 3.



Fig. 4.

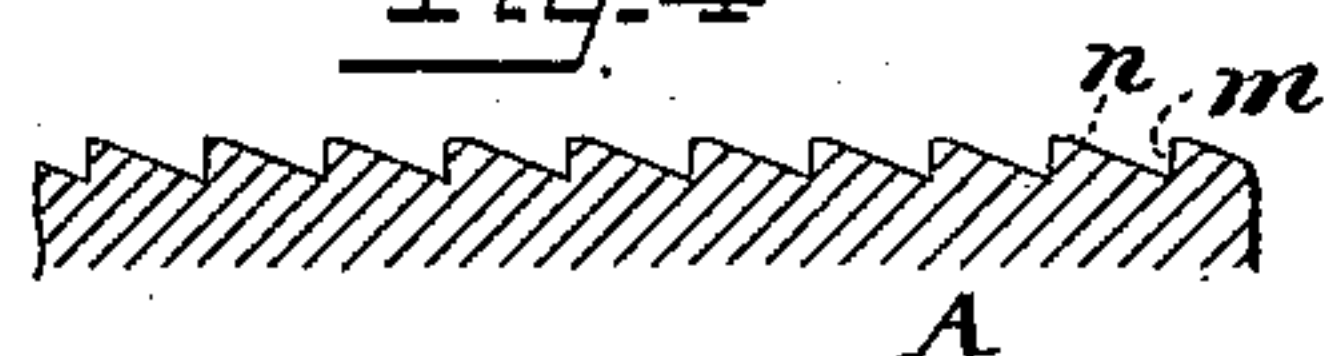


Fig. 5.



Fig. 6.

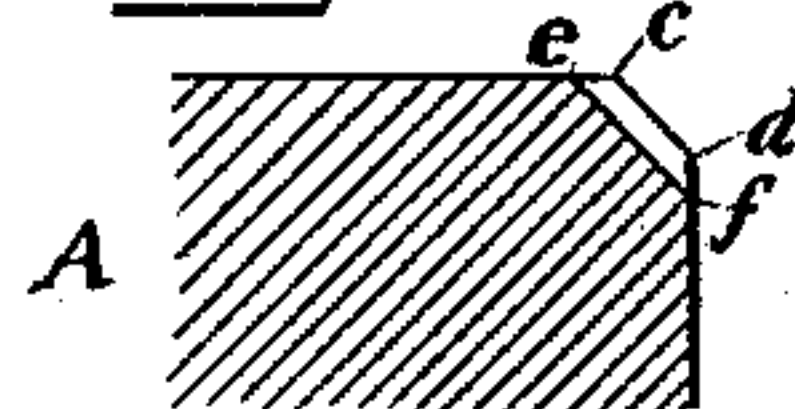
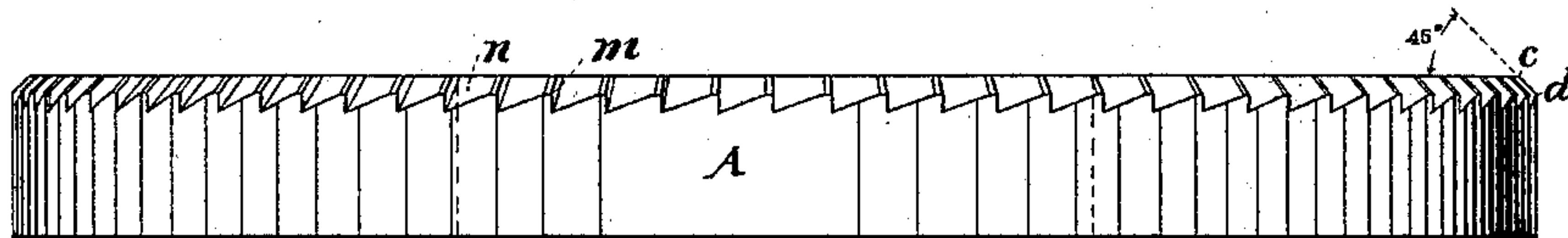


Fig. 2.



Witnesses:

Louis Zuehlke  
Francis T. Chambers

Inventor:

F. Philips

(No Model.)

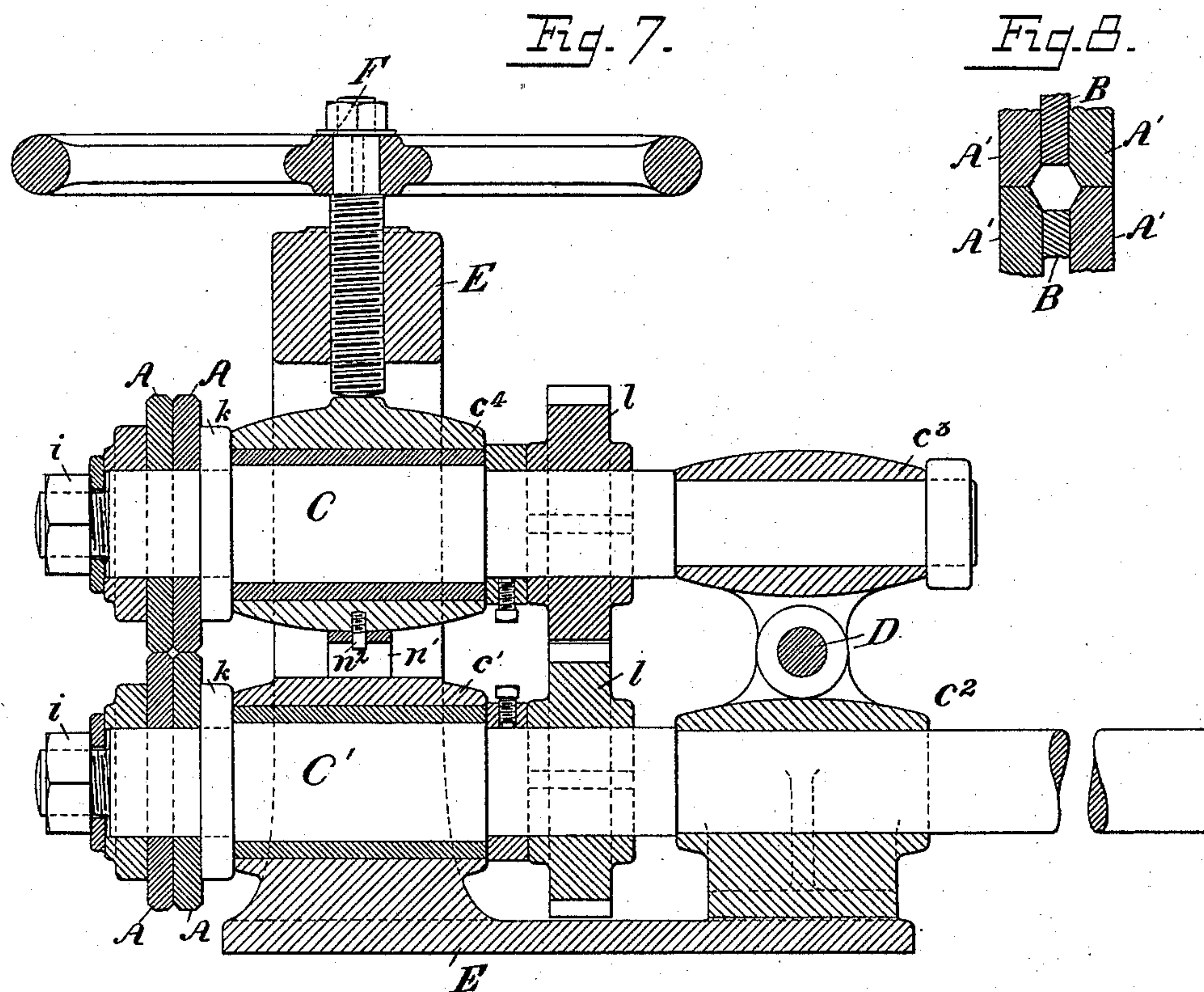
4 Sheets—Sheet 2.

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MACHINE FOR BARBING AND WINDING WIRE.

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Witnesses:  
Louis Kuebler  
Francis T. Chambers

Inventor:  
F. Philips

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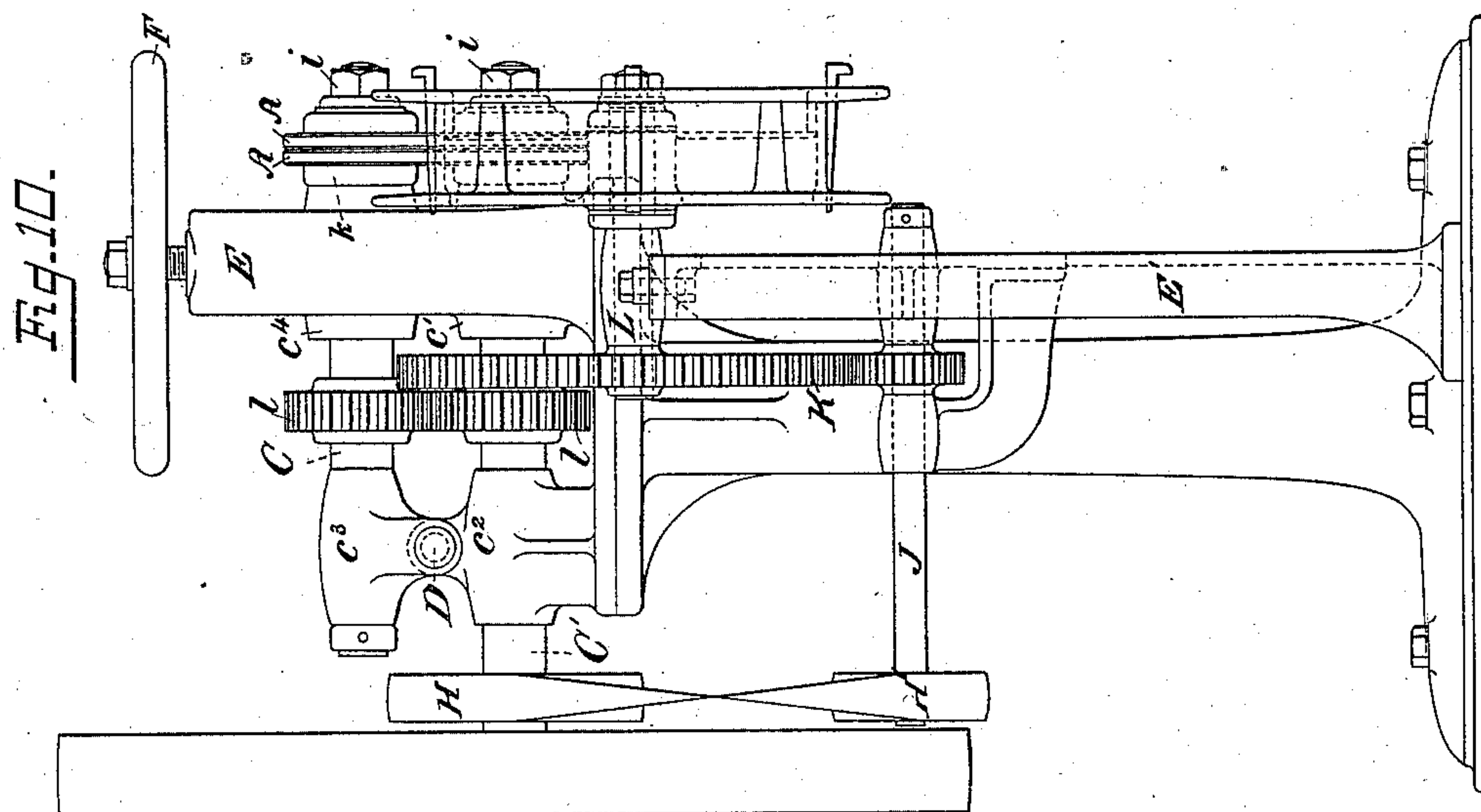
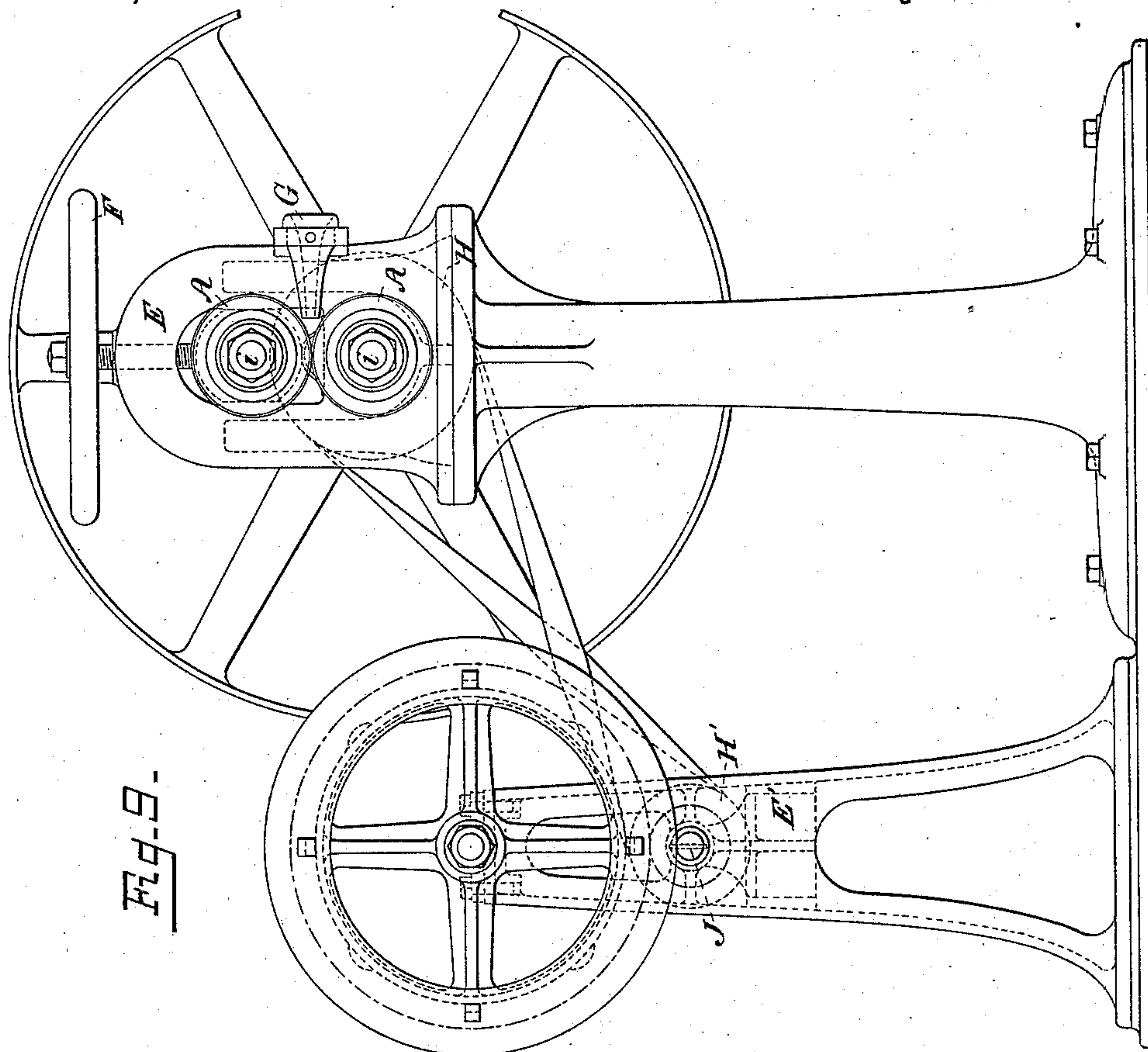
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F. PHILIPS.

MACHINE FOR BARBING AND WINDING WIRE.

No. 366,245.

Patented July 12, 1887.



WITNESSES=

*Louis Keller.*  
*Francis T. Chambers*

INVENTOR=

*Frederick Philips*



(No Model.)

4 Sheets—Sheet 4.

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Fig. 11.

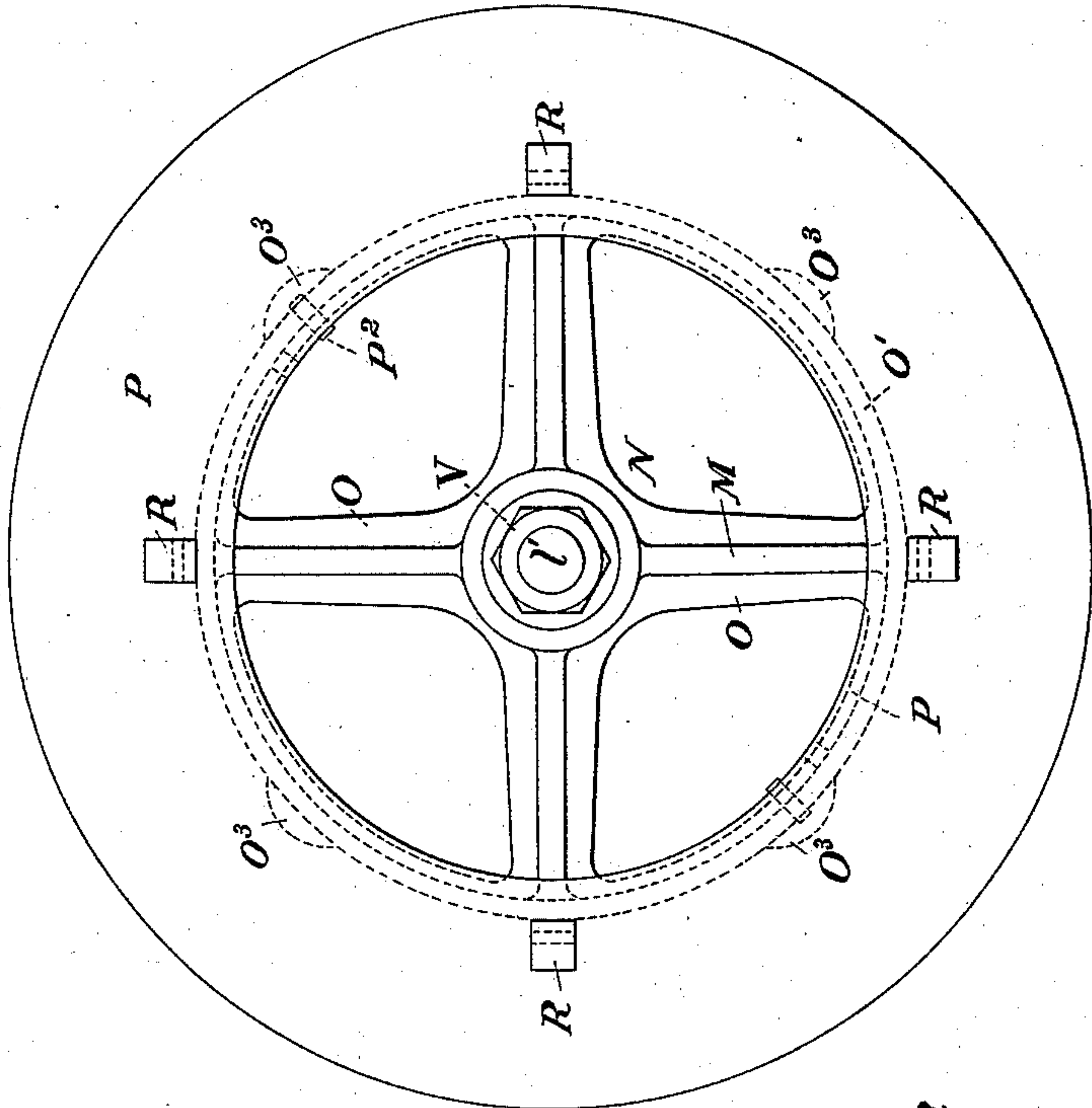


Fig. 12.

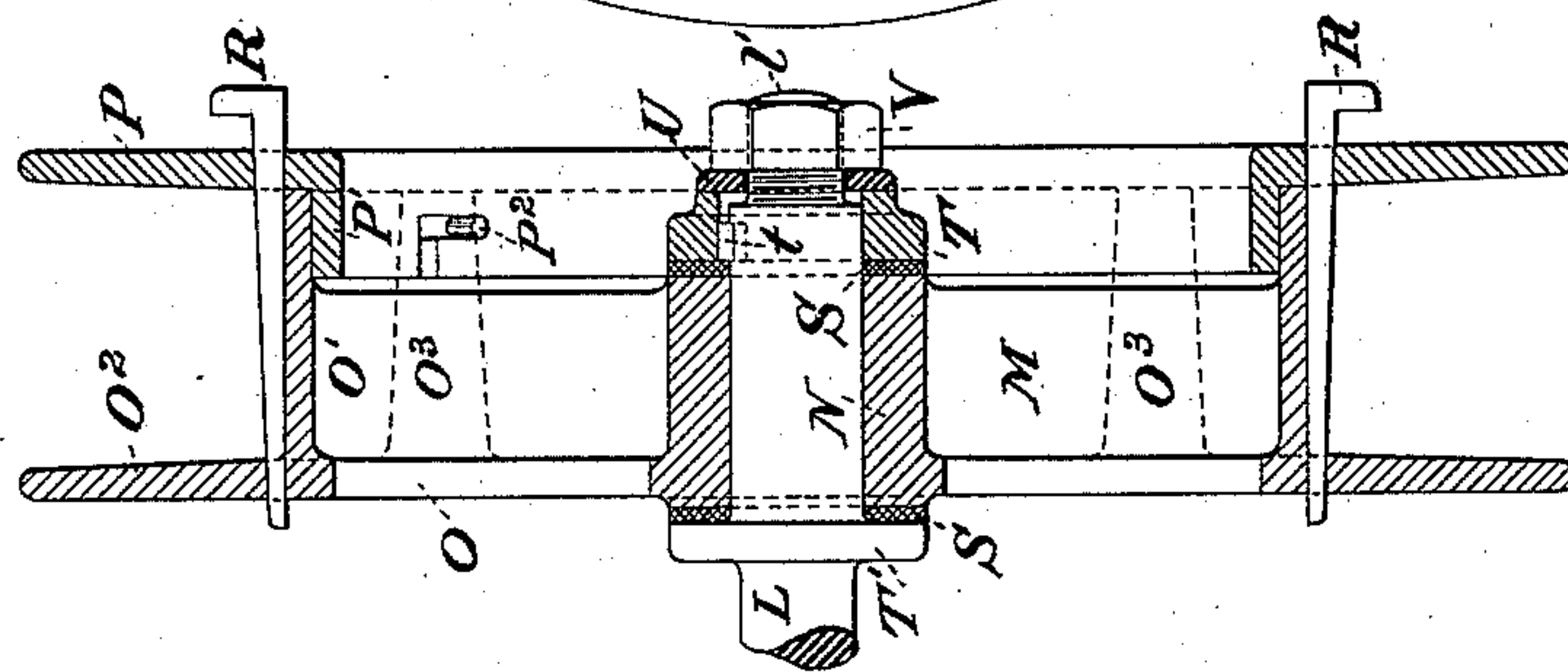


Fig. 13.

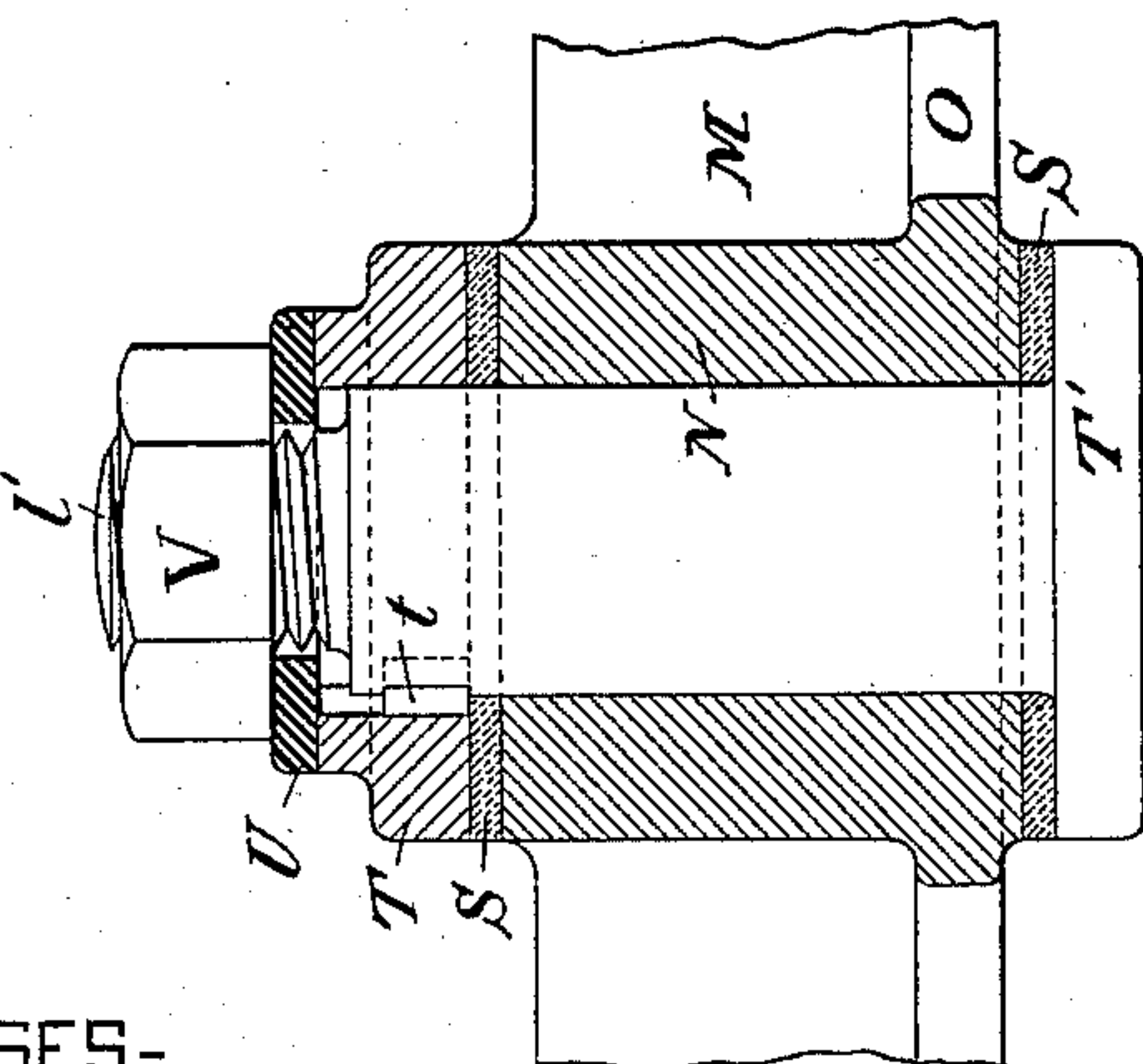
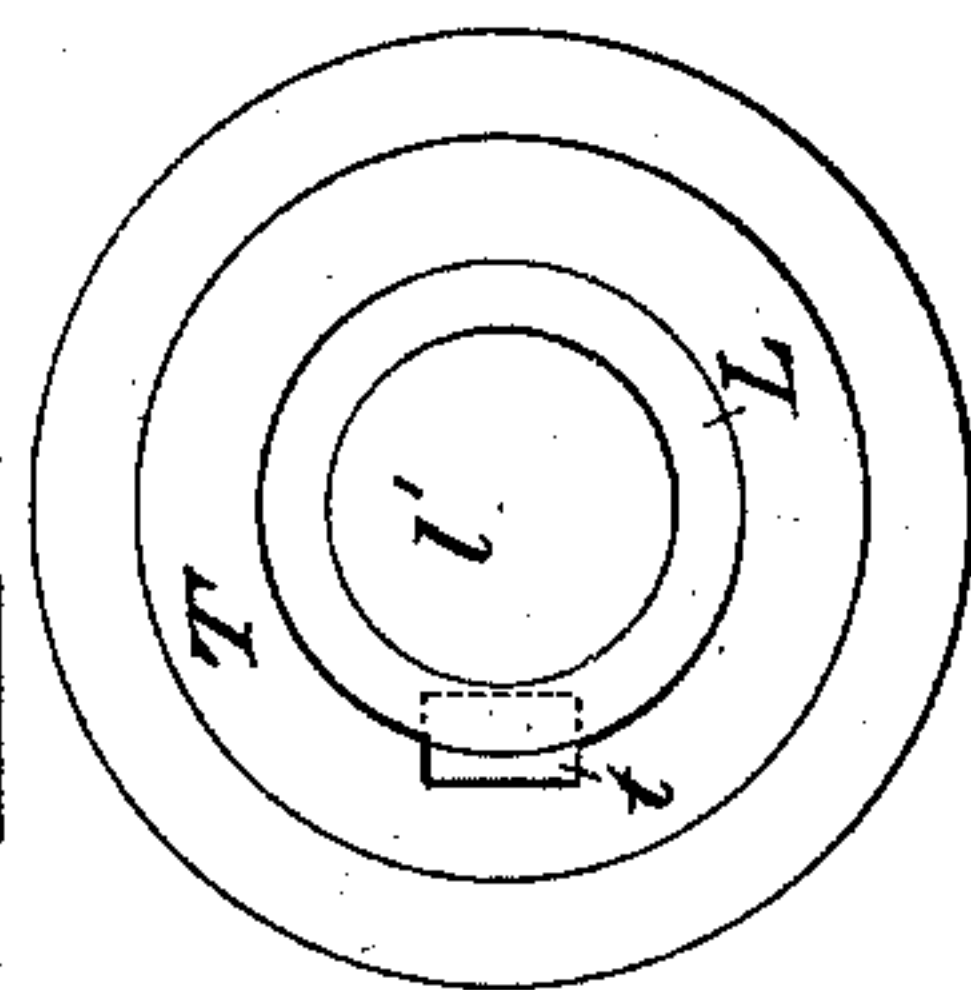


Fig. 14.



WITNESSES=

*Louis Kuebler.*  
*Francis T. Chambers*

INVENTOR=

*Frederick Philips*



# UNITED STATES PATENT OFFICE.

FERDINAND PHILIPS, OF PHILADELPHIA, PENNSYLVANIA.

## MACHINE FOR BARBING AND WINDING WIRE.

SPECIFICATION forming part of Letters Patent No. 366,245, dated July 12, 1887.

Application filed March 22, 1886. Serial No. 196,088. (No model.)

*To all whom it may concern:*

Be it known that I, FERDINAND PHILIPS, a subject of the Emperor of Germany, residing at Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in Machines for Barbings, which form a part of this specification.

My invention relates to machinery for barbing or indenting wire to be used in the manufacture of wire nails, and winding the same into coils as it comes from the barbing-rolls.

The object of my invention is to simplify the construction of the barbing mechanism and improve its mode of operation, and to unite with it winding appliances which will coil the wire into compact coils as it leaves the barbing-rolls, which coils may be easily withdrawn from the winding-reels. These objects I attain by means of the devices hereinafter fully described, and illustrated by the drawings, which show a barbing and winding machine embodying my invention, and in which—

Figure 1 is a side elevation of one of my barbing-rolls; Fig. 2, a plan or edge view of the same; Figs. 3 and 4, sections of right and left handed rolls, taken through the line  $xx$ , Fig. 1. Fig. 5 is a section of a round wire with inscribed and circumscribed squares. Fig. 6 is a section through the barbing-roll at  $yy$ , Fig. 1. Fig. 7 is a central side elevation of my barbing-machine; Fig. 8, a section through the line of contact of the barbing-rolls when arranged to make six rows of indentations. Fig. 9 is a side elevation of my barbing-machine with its winding-reel attachment; Fig. 10, a front view of the same. Fig. 11 is a side elevation of the part of the winding-reel which is permanently attached to the hub. Fig. 12 is a cross-section through the reel and its bearings, showing the removable section of the reel. Fig. 13 is a central cross-section through the hub of the reel, showing how it is attached to the shaft; and Fig. 14 is an end view of the reel and its shaft with its retaining-nut and washer removed.

A A A A and B B are the barbing-rolls, which, as illustrated in Figs. 1 to 7, are especially adapted to indent round wire with

four rows of barbs, in character and form like those of my improved nail for which I filed an application for Letters Patent September 25, 1885. The arrangement of rolls shown in Fig. 8 is adapted to indent the wire with six rows of indentations. I provide a roller, A or B, for each row of indentations which it is wished to make along the wire. Where, for instance, four rows are desired, four cylindrical rollers, A, are to be used, each having one of its edges faced off at an angle of forty-five degrees, so as to leave a cone-face,  $c d$ , Figs. 2 and 6, the maximum breadth of which should not be greater than the length of the side of a square inscribed in the round wire to be barbed. In this cone-face the teeth of the roll are cut, two of the rolls being cut right-handed and two left-handed, the shape and form of the teeth being of course the converse of the indentations desired upon the wire. I prefer to make the faces  $m$  of the teeth substantially in a plane passing through the axes of the roller, and to bring the face  $n$  gradually to the surface of the cone. The depth of the teeth should not, where four rollers are used, exceed that at which the line  $ef$ , Fig. 6, is equal to the side of the circumscribing square around the round wire. (See Fig. 5.) Where six rows of indentations are desired, six rollers are used, four having their edges faced off at an angle of thirty degrees to their sides, and two—the central ones, B B, Fig. 8—having plain cylindrical surfaces, the teeth in each case being cut or planed out across and parallel to the working-faces of the rolls, and in case of the six rollers being used the faces of the rolls should be on their surfaces not broader than the side of a hexagon inscribed in the section of the round wire, and the breadth of the teeth at their bottoms should be not greater than the side of the circumscribed hexagon. Where more rows of indentations are required, the chamfer of each roll corresponding to each row of indentations and the breadth and depth of the teeth may easily be ascertained, it being of course evident that my plan of providing a separate roller for each row of indentations is especially and best adapted to those cases where the number of rows is divisible by two. In all cases I prefer to bring the tapering side  $m$  of the teeth to the surface of the cone-face of the roll a little in front of the



next succeeding tooth-face  $n$ , so that a portion of the cone-surface  $g h$ , Fig. 1, is left. This gives a desirable bluntness to the teeth and insures uniformity in the depth of the indentations. The barbing-rollers having been prepared, as described, are then secured upon two shaft,  $C$  and  $C'$ , the right and left handed rollers of course facing each other upon the same shaft, and the two clamped tightly together between the shoulder  $k$  and the nut  $i$ . (See Fig. 7.) The bottom shaft,  $C'$ , is secured in bearings  $c' c^2$ , formed in or securely attached to a frame,  $E$ . The shaft  $C$  rests with its end farthest from the rollers in the bearings  $c^3$ , which is hinged to the frame  $E$  at a point,  $D$ , situated in the line which passes through the contact-points of the upper and lower rollers and of the pitch-line of the teeth of the spur-wheels  $l l$ , by means of which the shaft  $C$  is driven by the shaft  $C'$ . The forward end of the shaft  $C$  is provided with a bearing,  $c^4$ , which is allowed to move vertically in the frame  $E$ , and is held down, so as to bring the upper rollers in proper proximity to the lower rollers, by means of a screw,  $F$ , passing through the upper part of the frame.

On the bottom of the bearing  $c^4$  a spring,  $n'$ , is secured by means of a screw,  $n^2$ . This spring is compressed between the bearing  $c^4$  and the bearing  $c'$  when the rolls are brought together, and lifts the upper rolls when the pressure is released. The wire is fed to the barbing-rolls through a properly-shaped tube,  $G$ , (see Fig. 9,) and in passing between them receives, of course, the indentations corresponding in form and dimensions to those of the teeth on the rollers.

Upon the shaft  $C'$  is secured a pulley,  $H$ , which drives a shaft,  $J$ , by means of a pulley,  $H'$ . This shaft  $J$  is secured in bearings upon a frame,  $E'$ , which sustains a winding-reel,  $M$ , the shaft of which is driven from the shaft  $J$  by means of a suitable train of gearing, such as indicated at  $K$ , Fig. 10. This reel is situated immediately in front of the barbing-rolls and turns freely upon its supporting-hub  $N$ , and is secured to the driving-shaft  $L$  by being clamped between the collar  $T'$  and the collar  $T$ , washers  $S S$  being interposed between the ends of the hub and the collars, and any desired degree of compression being obtained by means of the nut  $V$  meshing with the threaded end  $V'$  of the shaft  $L$ . The collar  $T$  moves freely in the direction of the length of the shaft  $L$ , but is prevented from turning upon it by a key,  $t$ . (See Fig. 13.) Forming a part of the same casting as the hub  $N$ , or permanently secured thereto, is the reel-face  $O'$  and the flange  $O^2$ , Fig. 12. A number of projections,  $O^3$ , are formed in the face  $O'$  of the reel, and tapering gradually from the rim  $O^2$  to the outer edge of the reel-face. Into the inner face of the reel, and on the opposite side to the flange  $O^2$ , fits an annular flange-rim,  $P P'$ , which is secured in place by means of a bayonet-clasp,  $P^2$ , Fig. 12, or any other convenient fastening. The flange  $P$  of this annular rim has holes or open-

ings, through which wedges  $R$  are introduced, which extend across the face  $O'$  of the reel, gradually tapering as they approach the rim  $O^2$ . The actuating-gearing of the shaft  $L$  is so proportioned that the reel-face  $O^2$  shall normally move with a speed as great or a little greater than the speed of the faces of the barbing-rolls  $A$ , so that the wire between the barbing-rolls and the reel will always be under some tensional strain, and consequently will be wound into a tight and compact roll or coil, the frictional attachment of the reel to its driving-shaft allowing it to slip thereon, so that its actual speed will be the same as that of the barbing-rolls. When the reel is wound with wire, it is removed from its supporting-frame  $E'$ , and the wedges  $R R$  are drawn, thus relaxing the grip of the coiled wire upon the reel-face. The flanged rim  $P P'$  is then removed. The coil of wire now rests upon the tapering projections  $O$  only, and can therefore be readily withdrawn outwardly over the incline thus presented. The coiled wire withdrawn in this way may be at once taken to the nail-machine, and the reel replaced on its frame  $E'$ , and re-wound with wire.

In describing the form and construction of my barbing-rollers I have spoken of the wire as being round, as is most usually the case. It is evident, however, that the rolls are well adapted for use on wires of varying shape in cross-section, the essential feature of the rolls being that there should be a separate one for each row of indentations, and that the teeth should be cut directly across surfaces formed on the rolls parallel to the angular position of the indentations, relative to each other.

While I prefer to clamp the winding-reel upon its driving-shaft, as shown and described, it is of course evident that it may be given the same capacity of maintaining a steady and constant pull upon the wire by means of a properly-adjusted friction-clutch situated in any part of the mechanism which drives it.

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

1. In a machine for barbing wire, the combination of parallel driving-shafts with barbing-rolls corresponding in number to the rows of indentations to be produced on the wire, and having their teeth formed in surfaces corresponding in angular position to that of the rows of indentations to be formed.

2. Barbing-rolls constructed and adapted for use substantially as specified, having their teeth formed with faces  $m$  substantially in a plane passing through the axes of the roll, and their faces  $n$  tapering gradually upward.

3. Barbing-rolls constructed and adapted for use substantially as specified, having their teeth formed with faces  $m$  substantially in a plane passing through the axes of the roll, their faces  $n$  tapering gradually upward, and crowns  $g h$ , consisting of a portion of the original roll-surfaces.

4. In a machine for barbing wire, the com-



5 bination, with parallel driving-shafts, of barbing rolls or disks having teeth formed in their peripheral edges, and adapted to be secured in pairs or sets upon the driving-shafts so as to form dies for barbing the wire, substantially as shown and described.

10 5. In combination with barbing mechanism, the winding-reel having driving mechanism adapted to give the reel-surface a normal speed slightly greater than the speed of the barbing-roll surface, said driving mechanism having a yielding frictional connection with the said reel, substantially as specified.

6. A wire-winding reel having, in combina-

tion, the rim  $O'$  and flange  $O^2$ , rigidly attached 15 to the hub  $N$ , the removable flange  $P P'$ , and wedges  $R$ , extending through the flange  $P'$  across the face of the reel.

7. A wire-winding reel having, in combination, the rim  $O'$  and flange  $O^2$ , rigidly attached 20 to the hub  $N$ , and having the tapering projections  $O^3$  formed on the reel-face, the removable flange  $P P'$ , and wedges  $R$ , extending through the flange  $P'$  across the face of the reel.

FERDINAND PHILIPS.

Witnesses:

RICH'D. S. CHILD, Jr.,  
JOSHUA MATLACK, Jr.