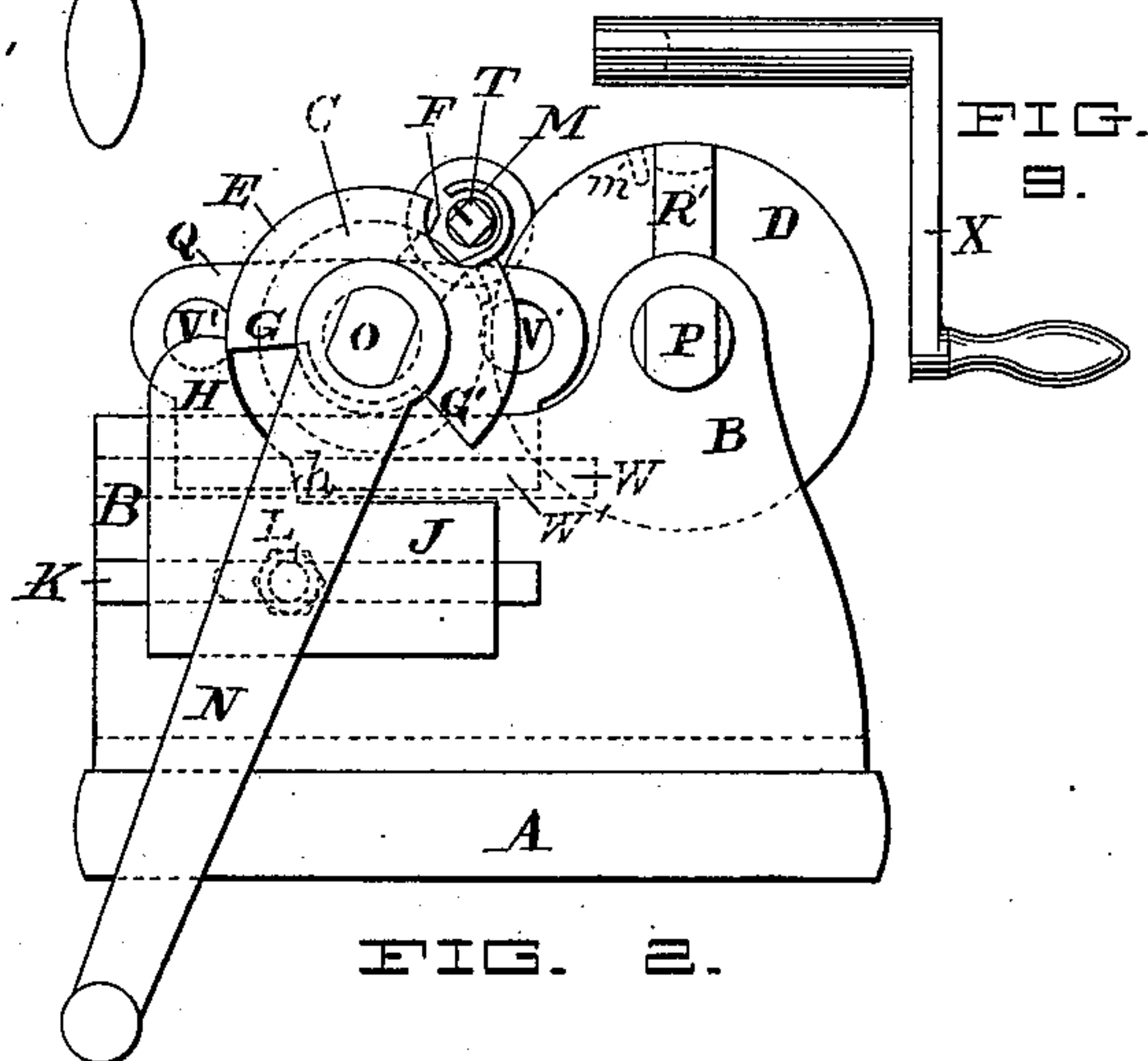
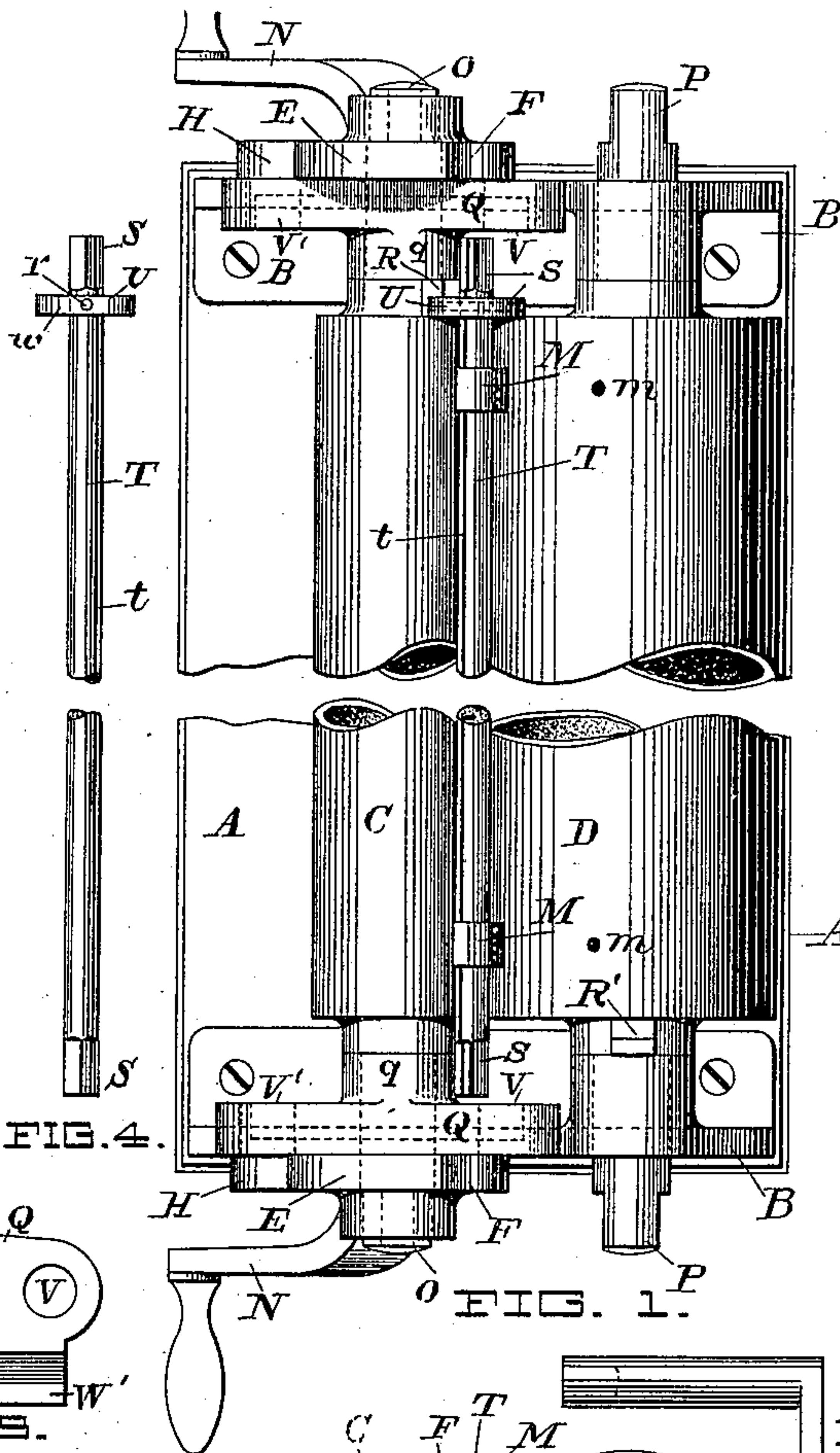
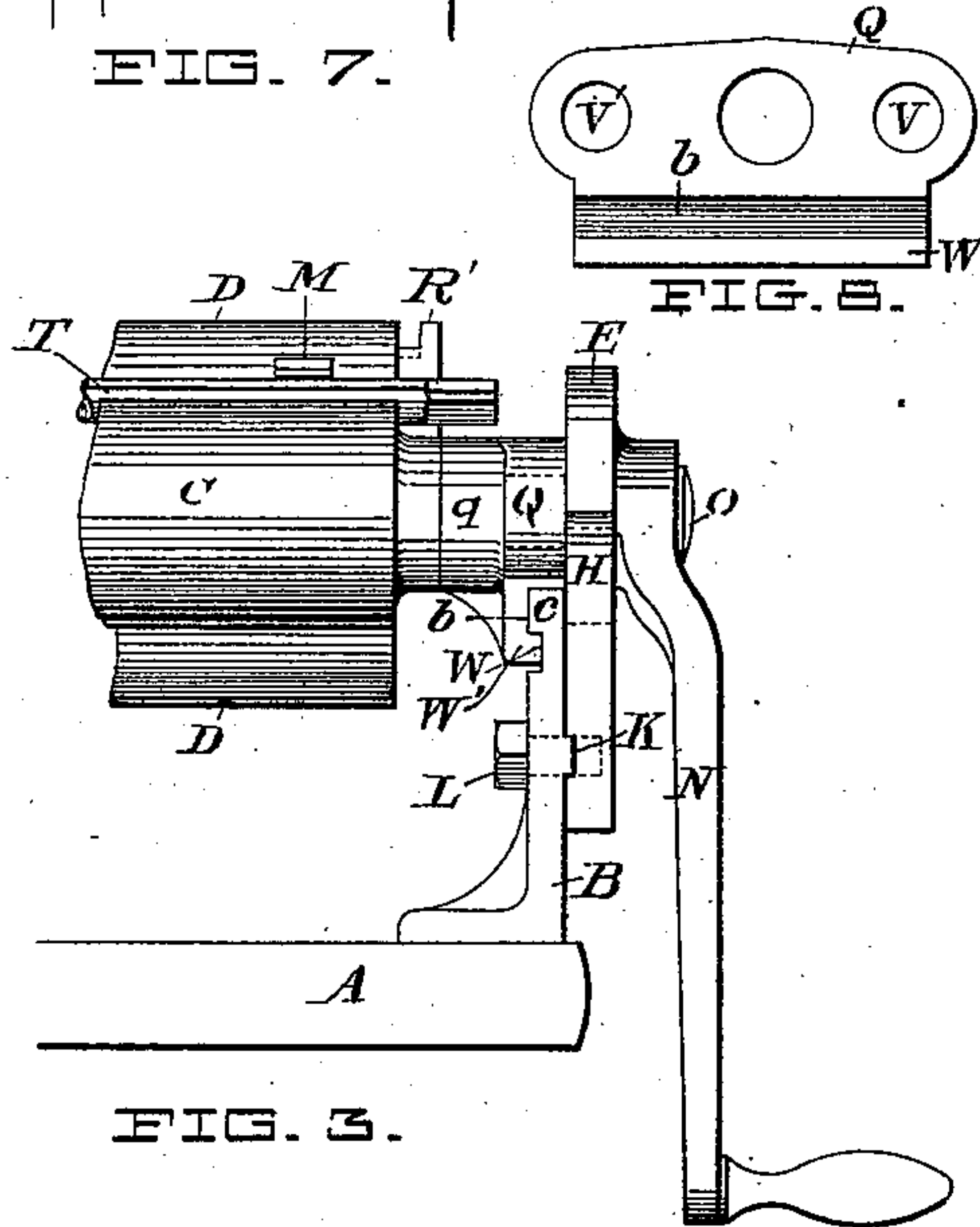
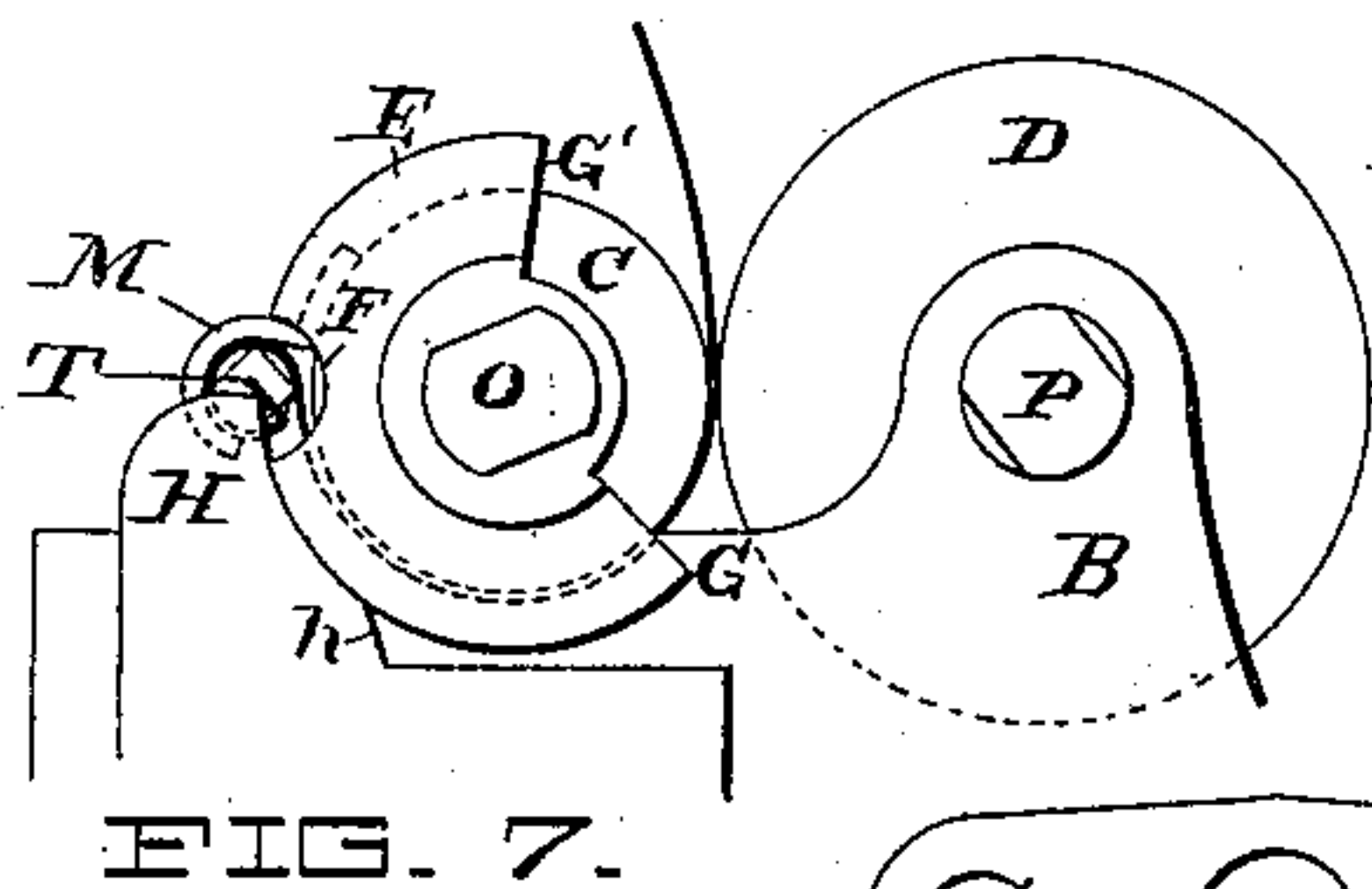
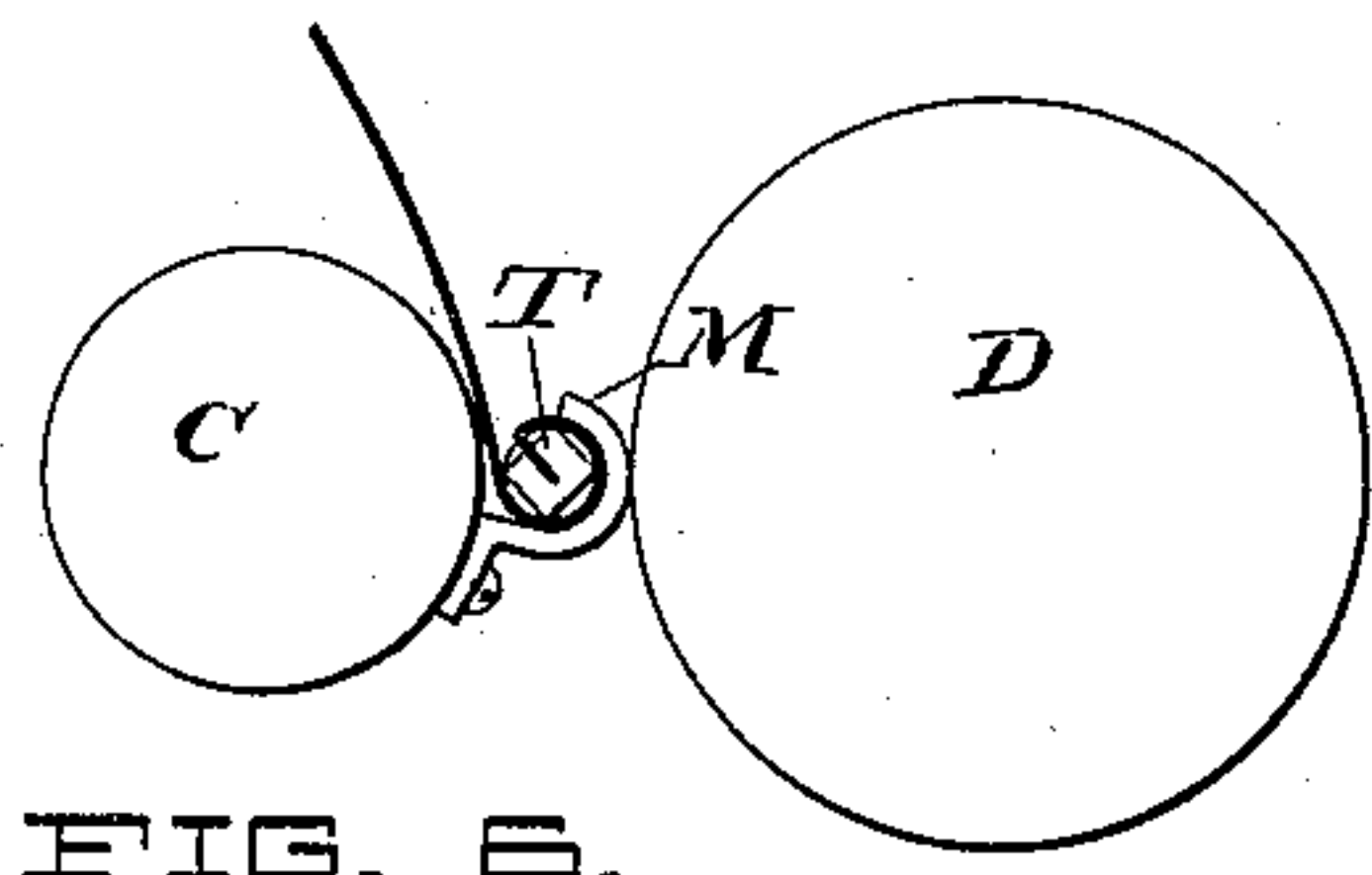
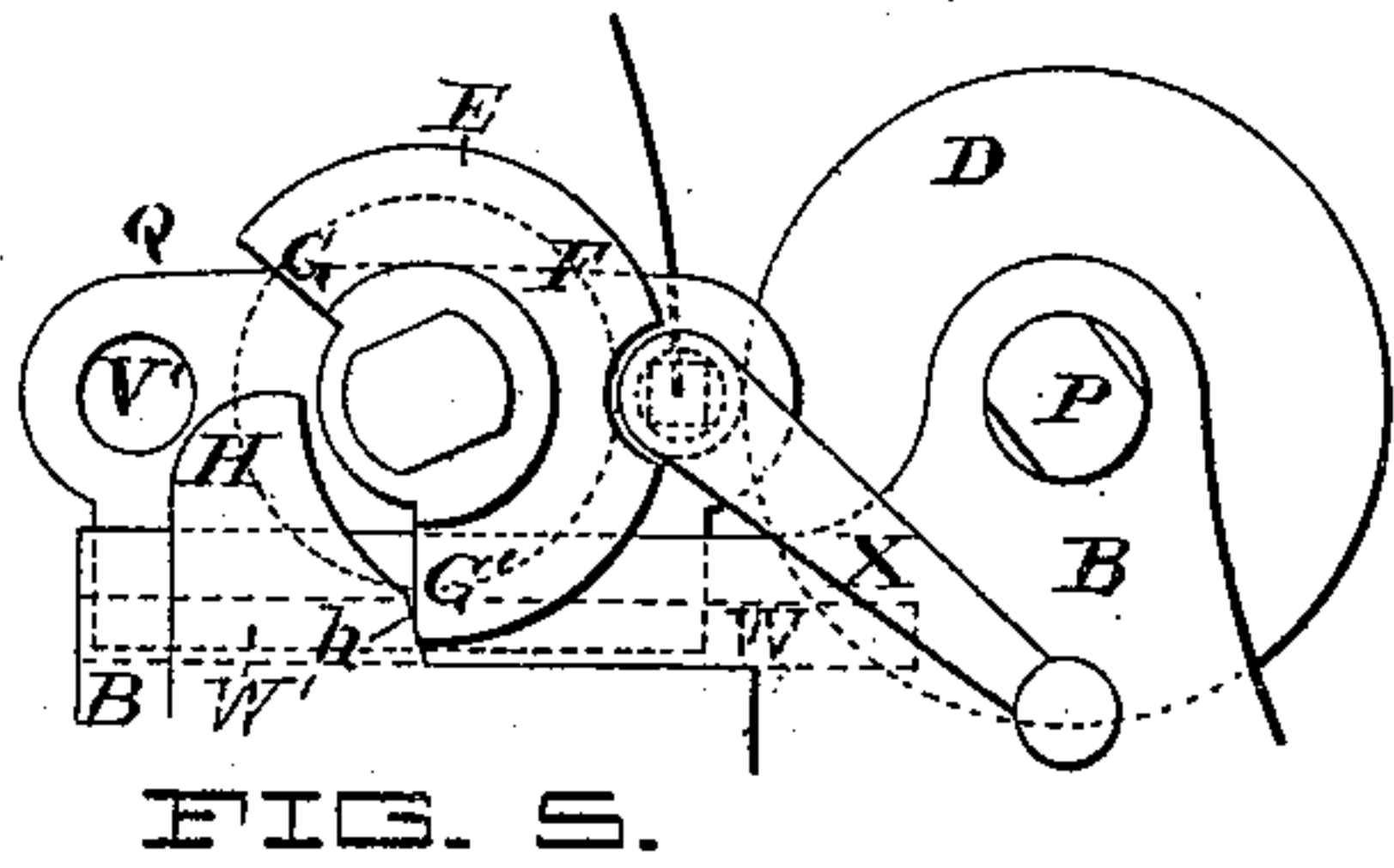


(No Model.)

E. G. WATROUS.
GUTTER FORMER.

No. 599,028.

Patented Feb. 15, 1898.



WITNESSES:
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UNITED STATES PATENT OFFICE.

EARL G. WATROUS, OF LANSINGBURG, NEW YORK, ASSIGNOR TO DENNIS J. WHELAN, OF TROY, NEW YORK.

GUTTER-FORMER.

SPECIFICATION forming part of Letters Patent No. 599,028, dated February 15, 1898.

Application filed June 17, 1897. Serial No. 641,152. (No model.)

To all whom it may concern:

Be it known that I, EARL G. WATROUS, a citizen of the United States, residing at the village of Lansingburg, in the county of Rensselaer and State of New York, have invented certain new and useful Improvements in Gutter-Formers; and I do hereby declare that the following is a full, clear, and exact description of the same, and, in connection with the accompanying drawings, constitute a specification thereof.

This invention has for its object to bend long sheets of metal into proper shape for gutters for eaves-troughs for buildings, and has provisions for turning a bead on one edge to reinforce the longitudinal stiffness thereof and also to bend the main body of the metallic sheet into a semicylindrically-shaped trough.

The invention is fully disclosed in the drawings, in which—

Figure 1 shows a broken plan of my machine. Fig. 2 is an end elevation of the same. Fig. 3 is a side elevation of one end of the machine. Fig. 4 is a view of the beading-roll. Fig. 5 is a view of one end of the machine, showing the position of the parts when the beading-roll is passing the presser-roll. Fig. 6 shows the position of the parts at the moment of the completion of the bead. Fig. 7 shows the position of the parts after the beading-roll has passed out of contact with the presser-roll.

The machine will first be described in connection with the drawings, after which the subject-matter of the invention will be pointed out in the claims.

The operative parts are mounted on two end frames B B, which are attached to the base A. These end frames or standards are rights and lefts and have bearings for the journals of the non-removable roller D. This I designate the "presser-roller," and it is hollow and has a fixed head at each end which terminates in a journal, the projecting end of which is fitted, as at P P, to take on a crank N N, by which it may be turned. A bracket R' is attached to one end of this roller for the purpose of taking in a flange U on the beading-roll T for the purpose of preventing end-wise movement of that roller. It is also tapped, as at m m, for bolts, whereby the re-

taining-clips M M may be attached thereto when it is desired to convert the roller D from a presser-roller to a forming-roller. Each of the standards B B has a horizontal groove W, in which slides the rib W' of the journal-block Q. This journal-block, which is shown at Fig. 8, is designed to be reversible, so as to admit of the use of rollers of two sizes. The middle hole forms a bearing for the shaft of the roller C and the other two holes V and V' furnish bearings for the socket of crank X, by which the beading-roller is turned, as seen in Fig. 5. It has a groove b, which takes in the rib c, Fig. 3, of the standard B and thus forms a slideway for the block Q to move on toward and from the large roller. On the outside of each standard is bolted an adjustable stop H, which is substantially of the shape seen in Fig. 2. Its inside is grooved to move on a rib K to maintain its proper position and is held in adjustment by the bolt L. It coöperates with the flange E, which is an appurtenance of the crank N, in the manner hereinafter described.

The forming-roller is a plain cylinder C, of which the journals project sufficiently through the blocks Q Q to take on a crank N at each end. A series of clips M M are attached at intervals in line along the surface of roller C and constitute bearings for the beading-roller T to turn in. Roller C is also provided at one end with a bracket R to receive the collar U of the beading-roller. The beading-roller is seen at Fig. 4 and is simply a plain cylinder squared at each end to take on a crank, (shown at Fig. 9,) by which it is turned in the process of forming a bead on the sheet of metal of the gutter. It is also grooved, as at t, from end to end to take in the edge of the sheet of metal to be formed. Crank N and the flange E are integral, and one is attached to each end of the forming-roller C. This flange is gapped, as seen in Fig. 5, from G to G' for the purpose of permitting the blocks Q Q to recede from the presser-roller while the clips M M are passing the presser-roller during the revolution of the forming-roller. It is also gapped, as at F, to permit the beading roller or mandrel to be inserted in and withdrawn from the clips M M. The inner edge of stop H is made concentric

with and, when the forming-roller is in contact with the presser-roller, coincident with the periphery of the flange E.

The machine is so constructed that the positions of the two rollers are transposable, so that a gutter may be formed on either at will. To accomplish this, if the cranks N N are removed from the journals of the roller C the journal-blocks Q Q may be slid on the ways *b c* out of their position on the standards, carrying the rollers C with them, which is then slipped out of its bearings in the blocks. Then the roller D is detached by loosening one of the standards B from the base and withdrawing it from its bearings in the standard. Roller C is then inserted in the former position of roller D, and the loosened standard is restored to its former position and secured. The clips M M are then transferred from roller C to roller D, which is then mounted in its proper bearings in the blocks Q Q. These are then slipped into position over the ways *b c* of the standards, after which the cranks N N are attached to the ends of the journals in the same way and position as they had previously been connected with the journals of the roller C. Stops H H are then secured in their appropriate positions and secured by the bolts L L.

The gap in flange E, between the shoulders G and G', is so arranged with reference to the point of contact of the clips M M with the surface of the presser-roller in the process of revolving the forming-roller toward the presser-roller that the shoulder G will be carried to a point where it will just slip over the top of stop H at the instant when the clips M M strike the presser-roller. This is shown in Fig. 2; and when the clips have passed out of contact with the presser-roller the shoulder G' will come into contact with the shoulder *h* of the stop H, when further rotation of the shaft by the cranks N N will cause the forming-roller to be crowded back against the presser-roller, so that during the remaining portion of the revolution of the forming-roller the two rollers will be kept in close contact.

The operation of the machine is as follows: The forming-roller is first turned until the gap F of the flange E comes opposite the holes in the blocks Q Q which are next to the presser-roller. Then the cranks X X are connected with beading-roller by passing their sockets through the holes V V of the blocks and over the shanks S S of the beading-roller. Then the groove *t* of that roller is turned upward, and the edge of a sheet of metal is inserted therein, when all the parts will be in the position shown in Fig. 5. While in this position one turn of the cranks X X is given, which turns the bead on the edge of the sheet and leaves the parts as seen in Fig. 6. The cranks X X are then removed, and the process is finished by the revolution of the cranks N N. When their rotation is started, the shoulder G' collides with the stop-shoulder *h* of the stop H, as seen in Fig. 5, and in this

relation acts as a fulcrum, against which the crank, acting as a lever, works to throw the roller toward the presser-roller. As the clips M M pass down out of contact with the presser-roller the blocks Q Q are forced toward the presser-roller until the sheet of metal is brought into contact with that roller. This occurs just as the corner of the shoulder G' escapes the corner of the stop *h*, when the periphery of the flange and the concave curve of the stop H, coinciding the edge of the flange, slides into that curve, and the parts pass into the position seen in Fig. 7, the forming and the presser rollers being meanwhile held in close contact with the sheet metal between them. After the rollers have been rotated until the edge of the sheet has passed out from between them and the gap F has been carried up out of the way of the stop H the sheet may be removed by rolling it on the beading-mandrel until the edge of it is clear of collision with the edge of the flange E, when it can be drawn off the mandrel through the gap F, thus leaving the machine in proper position to form another sheet.

From the foregoing it will be seen that the use of gears or other means of connecting the two rollers so that one may be positively driven by the other has been dispensed with, the presser-roller being rotated by the friction developed by the rotation of the forming-roller and metal sheet in contact therewith, which is adequate for all purposes.

I therefore claim as my invention the following:

1. In a gutter-forming machine, two rollers of different diameters which are interchangeable as to their working positions, a set of beader-roller bearings which are attachable to either roller as required, a grooved beader-roller and means for turning the same in its bearings to form the bead of the gutter, two journal-blocks which are reversible as to their working positions containing central bearings for the forming-roller and on either side bearings for centering and guiding the means for rotating the beading-roller which guide-bearings correspond in distance from the middle bearing to the radii of the two rollers respectively, and means for holding the two rollers in close contact against the sheet metal interposed between them during the formation of the gutter after the completion of the bead, and means for actuating the forming-roller.

2. The combination in a gutter-forming machine of a roller journaled in fixed bearings, a roller journaled in movable bearings, carrying a grooved beading-roller adapted to cooperate therewith in manner substantially as shown, a fixed stop and provisions connected with the last-named roller adapted to cooperate with said stop to force the rollers toward each other when the forming-roller is rotated.

3. The grooved beading-roller having provisions at one end for preventing endwise

movement, mounted in bearings open at one side attached to the forming-roller, in combination with the forming and presser rollers, each having a practically continuous cylindrical surface, the forming-roller being adapted to recede from and return to its normal position with reference to the presser-roller during the transit of the bead over the presser-roller, and means for rotating the forming-roller.

4. The combination with the forming-roller journaled in movable bearings carrying the beading-roller journaled thereon, and the presser-roller journaled in stationary bearings, with the flanged crank gapped as shown attached to the forming-roller shaft and the stationary concentrically-concaved stop.

5. The reversible bearing-blocks having

guide-holes which coincide with the axis of the beading-roller arranged at differential distances from the bearing of the forming-roller, in combination with two interchangeable rollers of diameters having radii to correspond with the differential distances aforesaid, respectively, as a means for forming gutters of different sizes upon the same set of rolls by transposing their relative positions in the machine.

In testimony whereof I have hereto subscribed my name in the presence of two witnesses.

EARL G. WATROUS.

Witnesses:

DAVID MIREY,

HUGH AUGUSTINE RILEY.