

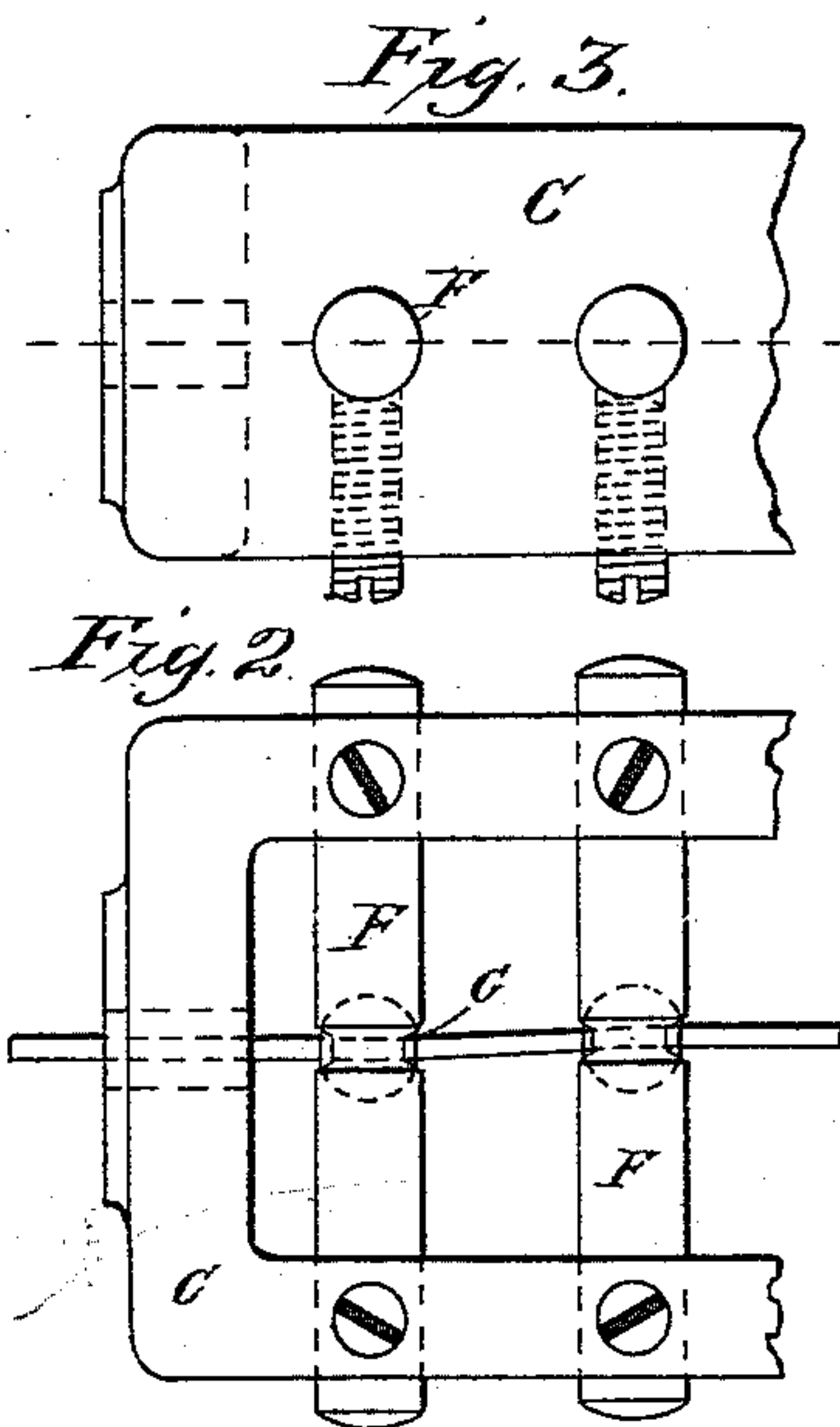
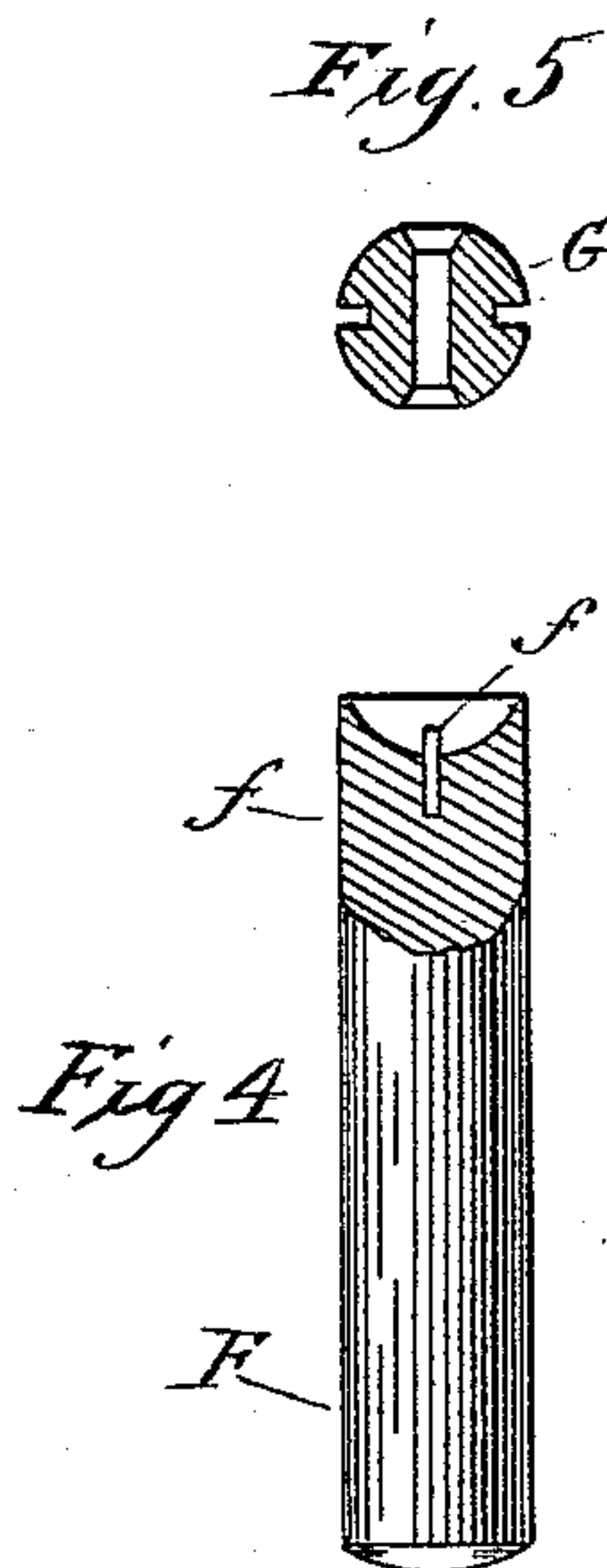
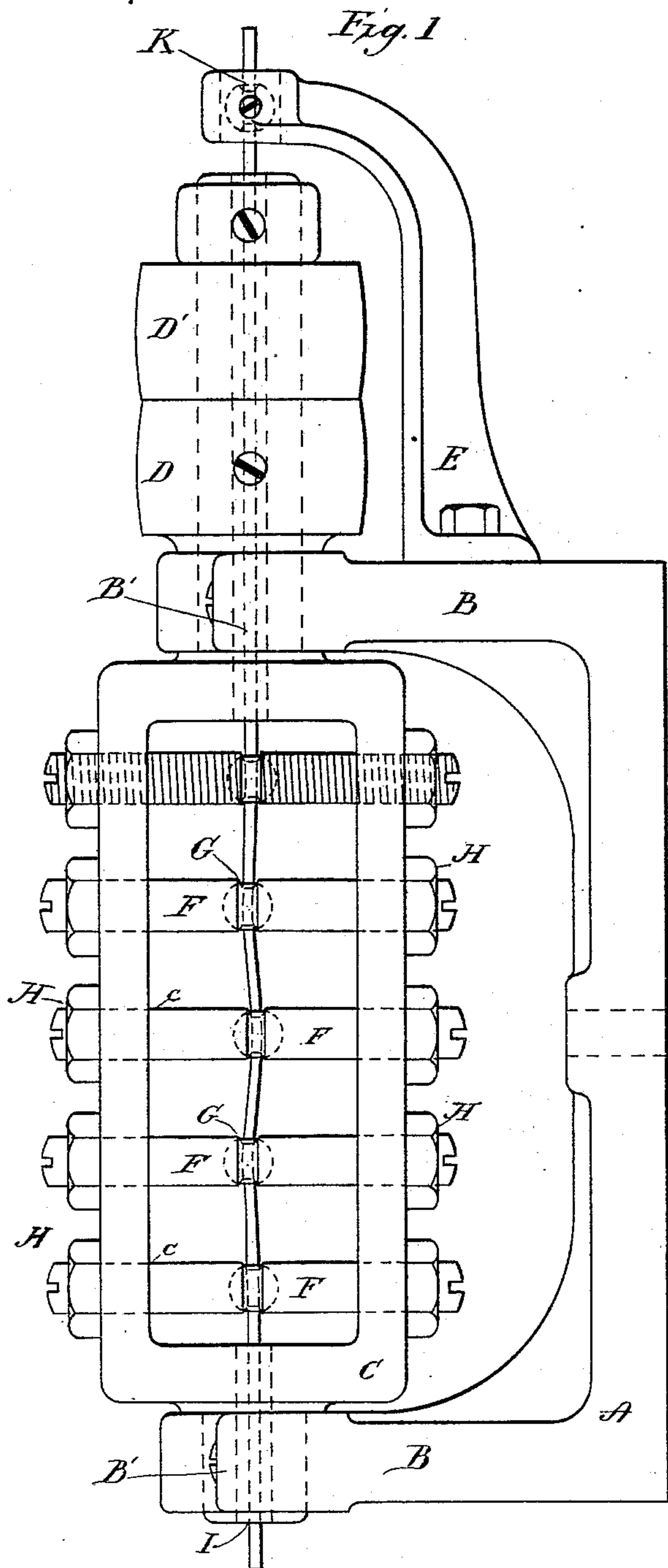
(No Model.)

S. W. GOODYEAR & M. A. MORRIS.

ROTARY WIRE STRAIGHTENER.

No. 277,267.

Patented May 8, 1883.



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UNITED STATES PATENT OFFICE.

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ROTARY WIRE-STRAIGHTENER.

SPECIFICATION forming part of Letters Patent No. 277,267, dated May 8, 1883.

Application filed March 6, 1883. (No model.)

To all whom it may concern:

Be it known that we, STEPHEN W. GOODYEAR and MARION A. MORRIS, citizens of the United States, residing at Waterbury, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Rotary Wire-Straighteners; and we 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.

Our invention relates to the class of machines for straightening wire in which the wire is passed longitudinally through a succession of holes or dies, or between concave bearing-points ranged at intervals in a frame which is mounted in bearings and rapidly revolved, the said succession of holes or bearing-points being adjustable in a direction transverse to the axis of the revolving frame; and the objects of our invention are, first, to prevent the spiral marks on the surface of round wire or metal bars which result from straightening them in the rotary straighteners now in use; second, to make it possible to straighten tubing of so light a character that it would be twisted or crushed by any attempt to straighten it in an ordinary straightener; third, to provide means for straightening wire or bars of metal of other shapes than round, which have been hitherto imperfectly straightened in what are known as "roll-straighteners," as an attempt to straighten them in any rotary straightener now in use would result in wearing off the corners of the wire or bar, and would soon cut out and wear away the friction-surfaces of the pins or dies which come in contact with the wire as the straightener is revolved. In practice, in the rotary straightener now in use, the wire is passed through a succession of holes or dies, or between concave bearing-points adjustably arranged in a frame which is so mounted as to permit of rapid rotation, the holes or bearing-points being so adjusted that the wire in passing through the straightener is forced out of line with the axis of the revolving frame in all directions, each part of the wire as it is drawn through being subjected to this deflecting influence, causing it to pass through the straightener in a serpentine course, emerging therefrom in a practically straight condition, but

with very objectionable spiral marks produced by the rotating friction-surfaces of the holes or bearings in the pins or dies through which it has been passed.

Our invention consists in the use of non-rotating shells or thimbles through which the wire passes, and which are interposed between the rotary friction-surfaces, which would otherwise come in direct contact with the wire, and the wires themselves. The non-rotating shells or thimbles take upon themselves the rotary friction which has heretofore been brought to bear directly upon the surface of the bar or wire, the result being a surface free from marks such as are made by the rotary straightener now in use.

In order to enable those skilled in the art to which our invention appertains to make and use our improvement, we will proceed to describe the same, referring by letters to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of a wire-straightening machine embodying our invention, the non-rotating thimbles being loosely held between the ends of screw-threaded pins which pass through the revolving frame from the outside, said pins being securely held from movement by check-nuts upon their outer ends. Figs. 2 and 3 are top and side views of a portion of the frame, with the pins made smooth and held in place by set-screws. Fig. 4 is a detail view of one of the pins, the inner end being in section to show the socket, and also a pin in the base of the socket, for a purpose presently to be described. Fig. 5 is a section of one of the shells or thimbles.

Similar letters of reference denote like parts in all the figures of the drawings.

It is not deemed necessary to minutely describe the machine itself, as it has long been in common use and is not of our invention, and, moreover, our invention is adapted for use in any form of rotary straightener.

A is the base of the machine, and B B the standards, having bearings B' B', which support the revolving frame C.

D D' are fast and loose pulleys. One of them, being rigidly attached to the trunnion of frame C, imparts motion thereto.

E is a bracket-arm having an aperture, K, which may hold a shell having an aperture

similar in shape and size to those in the shells in the revolving frame, and which serves to guide the wire as it leaves the machine. A similar aperture, I, may be provided for the wire to pass through as it enters the machine.

Both sides of the revolving frame are provided with holes *c c*, preferably screw-threaded, through which are passed a series of correspondingly screw-threaded pins or bolts, F F. The inner ends of these pins are provided with sockets *f*, and between the ends of each pair of pins, and resting in the sockets, is loosely held a perforated shell or thimble, G. The pins or bolts F are preferably held against displacement by check-nuts H, as shown in Fig. 1. If preferred, however, the pins may be made smooth, as shown in Figs. 2 and 3, and held in place by set-screws in the frame.

We also contemplate placing pins, as *f'*, in the bottoms of the sockets *f*, which are adapted to engage with a circular groove around the periphery of the shells or thimbles, thereby preventing a swiveling or oscillating motion of the latter transverse to the axis of the shells to such an extent as would keep the holes in the shells near enough in line with each other, so that the wire may be readily inserted.

It will of course be understood that it is not essential that the shells or thimbles be made in the form of spheres, as a conical or cylindrical form may be adopted without departing from the spirit of our invention, it being only necessary in carrying out our improvement that the outer circumference of the shells or thimbles be of some suitable shape to form a bearing-surface for the screws or pins, which by revolving around in contact with the shells or thimbles cause the thimbles which are out of line with the axis of the rotary frame to have a motion in a circle around said axis without rotating them on their own axes, so that the desired effect of straightening the wire is accomplished without the slightest injury to the surface thereof. The use of non-rotating shells or thimbles removes the great objection to straightening round wire and light tubing in rotary straighteners. The rotary straighteners now in use, moreover, can only be used for round wire; but our improved machine is equally adapted for straightening square, angular, half-round, or any other style of wire, tubing, or bars, it being only necessary to provide shells or thimbles having perforations corresponding in size and shape with the wire or bars to be straightened.

In using our invention for wire, bars, or tubes of other shapes than round it is desirable to pass it through a stationary aperture of the same shape and size as the apertures in the series of thimbles through which it is

to pass, either as it enters or as it leaves the machine, or, if preferred, at both points.

In use the shells or thimbles are ordinarily adjusted as follows: Any number of shells may be used from three upward; but five will be found a suitable number for ordinary purposes, the first being centered with the wire or bar as it enters the machine, the second slightly out of line to the left, the third out of line to the right, the fourth to the left, and the fifth centered with the first, and with the stationary apertures should one or both be used. As soon as the wire has been started in the machine the frame is rapidly rotated, which causes each portion of the wire, as it passes through, to be deflected or bent in all directions, but without twisting and without any rotary friction on the surface of the wire, so that the latter, when it emerges, will be thoroughly straightened, but will be wholly free from objectional marks.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. In a wire-straightener, a series of non-rotating independent thimbles capable of lateral adjustment by means of pins secured within the rotary frame, the shells, when the machine is in operation, having no axial rotation, but a movement in a circle around the axis of the rotary frame, substantially as set forth and described.

2. The combination, with the rotating frame and adjustable pins or bolts, of the shells or thimbles held in operative position by said pins or bolts, substantially as shown and described.

3. The combination, with the rotating frame, screw-threaded pins or bolts held in place by check-nuts, as shown, of non-rotating shells or thimbles loosely held in position between the ends of the pins which are turned in from opposite sides of the frame, as set forth.

4. The combination, in a machine for straightening wire, of the frame C, pins or bolts F, shells G, and a stationary aperture at one or both ends of the machine, substantially as specified.

5. The combination, with the frame rotating in standards, as shown, and the pins F, having sockets *f* and pins *f'* at their inner ends, of the shells G, having grooves in their peripheries, with which pins *f'* engage, for the purpose set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

STEPHEN W. GOODYEAR.

MARION A. MORRIS.

Witnesses:

D. F. WEBSTER,

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