

(No Model.)

J. LOGAN.

MACHINE FOR POLISHING METAL WIRE OR RIBBON.

No. 338,603.

Patented Mar. 23, 1886.

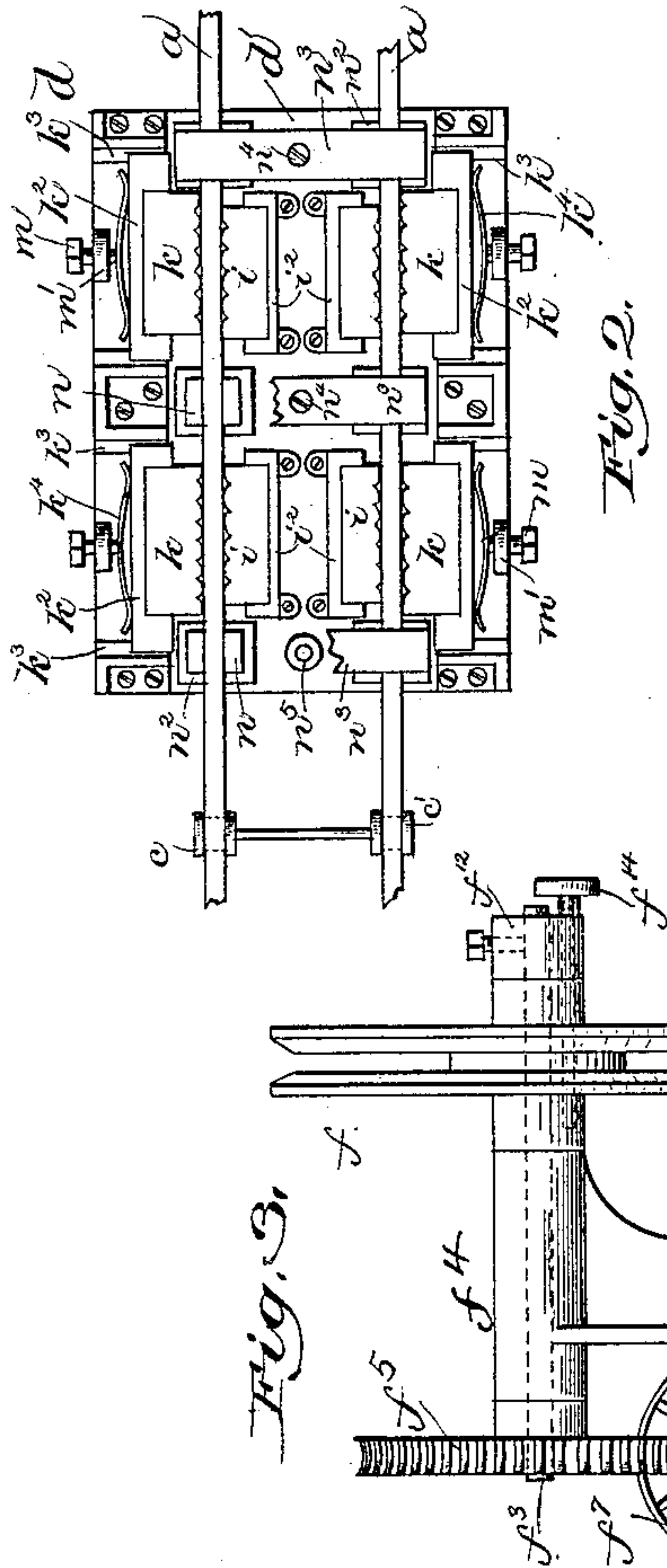
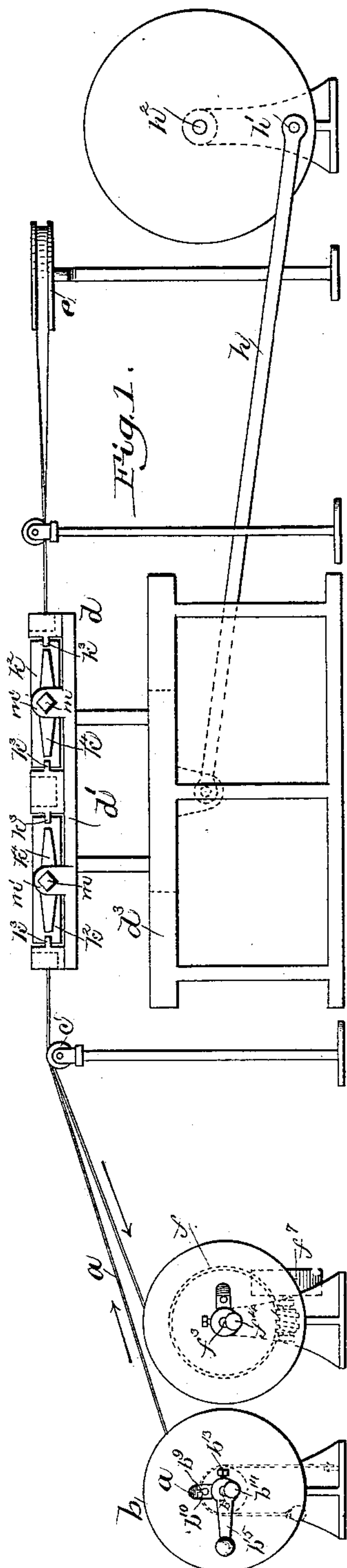


Fig. 3.

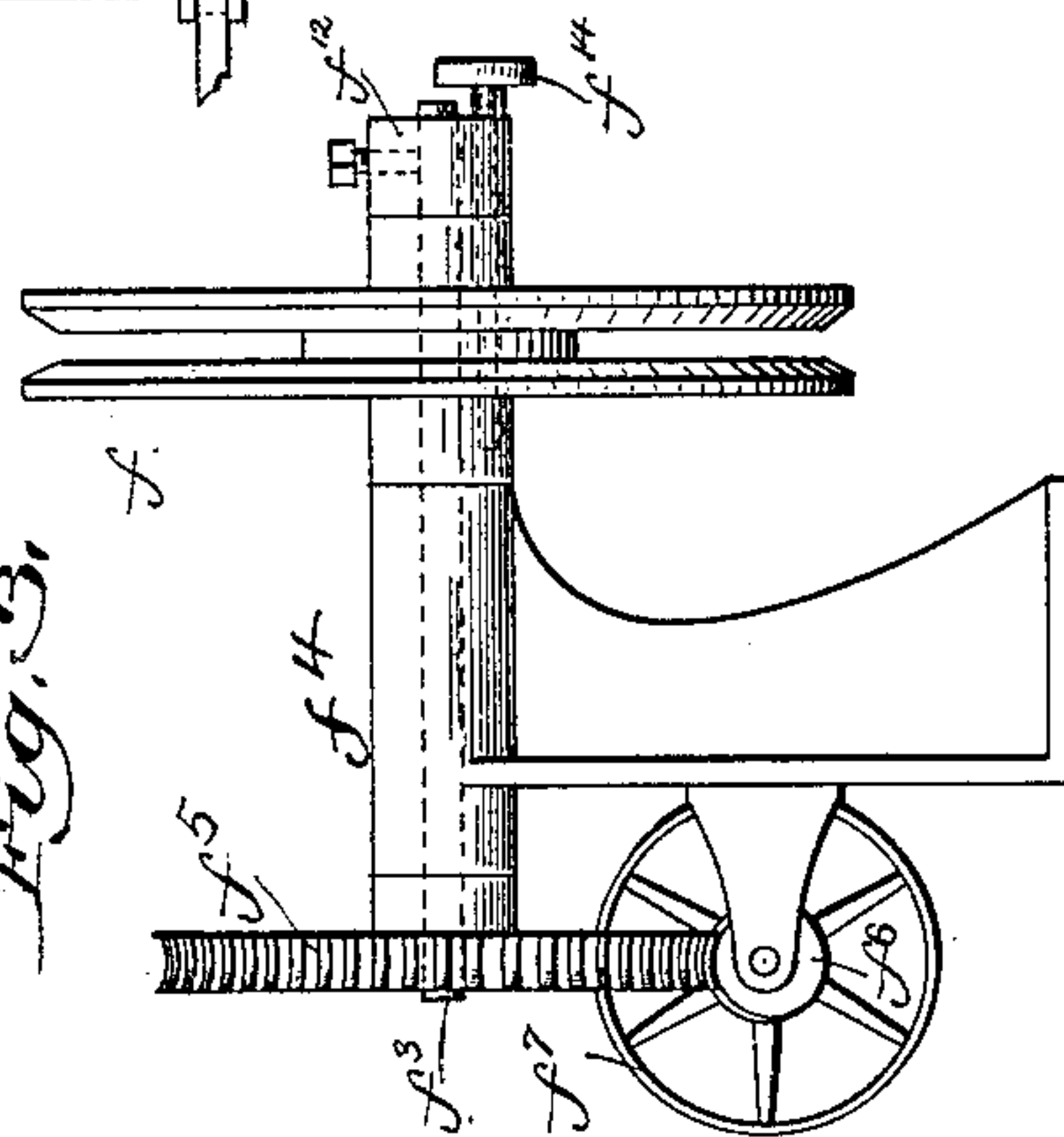
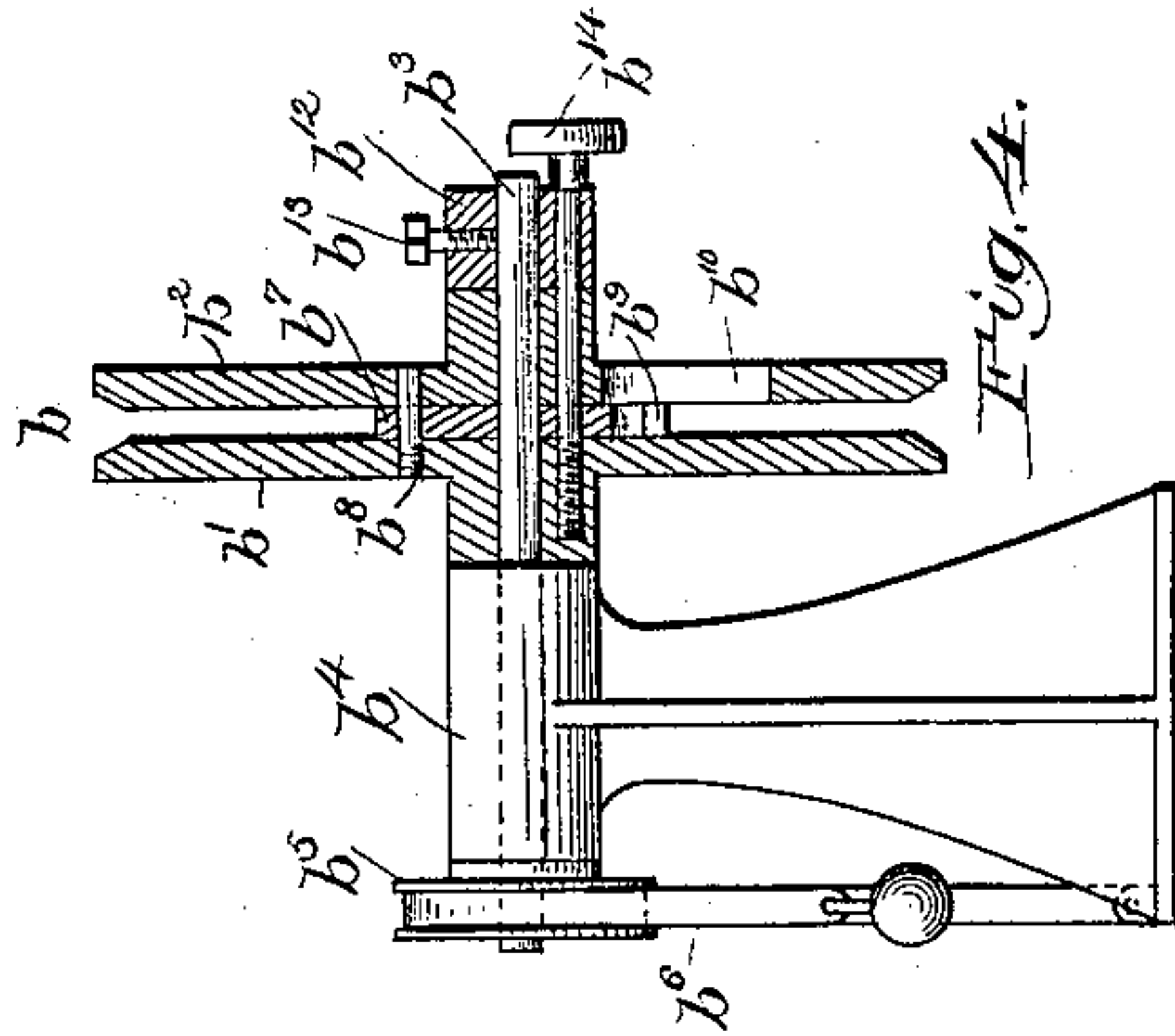


Fig. 4.



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UNITED STATES PATENT OFFICE.

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MACHINE FOR POLISHING METAL WIRE OR RIBBON.

SPECIFICATION forming part of Letters Patent No. 338,603, dated March 23, 1886.

Application filed March 27, 1885. Serial No. 160,143. (No model.)

To all whom it may concern:

Be it known that I, JOHN LOGAN, residing in Waltham, county of Middlesex, State of Massachusetts, have invented an Improvement in
5 Machines for Polishing Metal Wire or Ribbon, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 My invention relates to a machine for polishing wire or ribbon, being shown in this instance as adapted for polishing the edges of ribbon such as used for the mainsprings of watches.

As heretofore practiced in the manufacture
15 of mainsprings for watches, the ribbon is cut into pieces of the proper length for a mainspring—namely, about two or three feet long—and then two or more such pieces are stretched across between two clamps fastening their ends,
20 after which their edges are rubbed down or polished by a polishing-instrument moved back and forth along the ribbon by the hand of the operator, thus making the expenditure of time and labor for each spring considerable.

25 The object of my invention is to produce an organized machine, by which the ribbon in continuous length of from fifty to one hundred feet is rapidly polished and finished on its edges prior to being cut into lengths for the single
30 springs. The machine comprises a reel or holder upon which the unpolished ribbon is wound, preferably in its soft or untempered condition, and from the said reel the ribbon is led to a polishing-instrument consisting of a
35 carriage having a reciprocating movement on suitable guides and provided with polishing devices which bear against the edges of the ribbon as it is drawn or fed progressively through the said polishing device, and the ribbon is
40 then led around a pulley and returned in the opposite direction through another set of polishing devices on the polishing instrument or carriage, and finally wound upon another reel similar to the one that it is drawn off from, the
45 reel upon which it is wound being rotated at proper speed by suitable actuating mechanism, and thus serving to feed the ribbon through the polishing-instrument.

50 The invention consists in various combinations of the above-mentioned devices and in details of construction of the polishing-instru-

ment, as hereinafter described, and pointed out in the claims.

The machine has substantially the same effect upon the ribbon as the hand-operated instrument, the polishing device having a to-and-fro movement along the ribbon corresponding to the strokes of the hand operator, and the continuous progressive movement of the ribbon corresponding to the varying positions of
55 the stroke given by the hand operator in polishing the short pieces from end to end.

Figure 1 is a side elevation of an apparatus for polishing metal wire or ribbon embodying this invention; Fig. 2, a plan view of the polishing device or carriage, portions being broken
60 away to show the parts beneath; Fig. 3, an end elevation of the reel and its actuating mechanism, by which the ribbon is drawn or fed through the machine; and Fig. 4 an elevation,
70 partly in section, of the reel from which the ribbon is unwound.

The ribbon *a* to be polished is contained on a reel or holder, *b*, (best shown in Fig. 4,) consisting of two disks, *b'* *b''*, fitting loosely on a
75 shaft, *b'''*, turning in a bearing, *b''''*, and having fastened upon it a pulley, *b''''''*, over which is hung a weighted strap, *b''''''''*, the said pulley and strap constituting the tension device for producing suitable tension on the ribbon as it is
80 drawn off from the reel. A disk, *b''''''*, on the shaft *b'''* between the plates *b'* *b''*, and connected to rotate therewith by a pin, *b''''''*, constitutes the central hub upon which the ribbon is wound, the said disk having a narrow slot, *b''''''''*, into
85 which the end of the ribbon is inserted, as shown in Fig. 1, to make it fast in winding the ribbon onto the reel. The plate *b''* is provided with an opening, *b''''''*, exposing the slot *b''''''''*, so as to enable the operator to readily insert the
90 ribbon therein, and also enabling him to see when the ribbon is nearly all unwound. The shaft *b'''* is provided with a hub or collar, *b''''''*, made fast thereon by a clamping device or set-screw, *b''''''''*, and the reel *b* is made fast on or
95 caused to rotate with the shaft *b'''* by means of a pin or connecting device, *b''''''*, extending through the collar *b''''''* and into the reel, as clearly shown in Fig. 4. The shaft *b'''* may be provided with a crank or handle, *b''''''*, (see Fig. 1,) which may be integral with the hub or collar *b''''''*, or separately connected with the shaft
100

b^3 , and which enables the operator to rapidly wind the ribbon onto the reel previous to introducing it into the machine. The ribbon a is led from the reel b over a guide-pulley, c , and thence through the polishing-instrument d and around a guide-pulley, e , and back through the polishing-instrument, from which it passes over a guide-pulley, c' , and onto a reel, f , of similar construction to the one b , being connected with a collar, f^{12} , made fast on a shaft, f^3 , turning in a bearing, f^4 , and provided with an actuating worm-gear, f^5 , driven by a worm, f^6 , operated by a suitable pulley, f^7 , turning the reel f in the direction to wind the ribbon a upon it, and thus draw the ribbon rectilinearly off from the reel b and feed it through the polishing-instrument.

The polishing devices are supported on a carriage consisting of a bed-plate, d' , fastened upon a slide having a reciprocating movement in guides d^3 , being shown as actuated by a pitman, h , connected with a wrist-pin, h' , on a shaft, h^2 , actuated by a belt and pulley, or in any other suitable or usual manner, thus producing a rapid to-and-fro movement of the carriage and polishing devices supported thereon. The bed d' has fastened upon it polishing devices i , which may consist of blocks of emery, corundum, or other suitable polishing material, preferably having their faces which act on the ribbon serrated, as shown in Fig. 2, such construction preventing the surface from becoming coated with the metal or glazed. The said polishing devices i are held in suitable holders, i^2 , fastened upon the bed d' , being stationary with relation to the said bed; and co-operating with the stationary polishing devices i are polishing devices k , acting on the opposite edge of the ribbon supported in holders k^2 , movable toward and from the stationary polishing devices on guides k^3 , being acted upon by springs k^4 , which move them toward the ribbon, so as to produce the proper pressure between the ribbon and the polishing devices at either side thereof to produce the best effect. The force of the springs or pressure of the polishing devices may be adjusted by adjusting devices m , consisting in this instance of screws working in lugs m' on the bed d .

The portion of the ribbon that is acted upon by the polishing devices at each stroke is supported at either side of said polishing devices and prevented from twisting under the pressure of the latter by suitable guides or clamps, consisting of bed-pieces n , two of which are shown in plan in Fig. 2, preferably composed of wood, leather, or somewhat yielding material, held in suitable sockets, n^2 , on the bed d' , the ribbon a being held down flat upon said bed-pieces n by cross-bars or clamps n^3 , portions of which are shown partly broken away in Fig. 2, the said clamps preferably consisting of wood or being provided with a facing of wood or yielding material where they bear on the ribbon, and being held down upon the ribbon by screws n^4 entering lugs n^5 , one of which is shown in plan in Fig. 2.

By having the ribbon returned through the polishing-instrument in the opposite direction from that in which it started, instead of being fed directly through the polishing device in one direction, its exposure to the polishing action is increased, so that it may be fed more rapidly and at the same time the strain on the ribbon is equalized so that the drag or pull of the polishing device does not interfere with a uniform feeding movement.

The action of the reciprocating polishing devices and effect thereof on the ribbon is similar to that of the usual hand-operated devices, producing a finish of the same quality, but of greater uniformity, as all parts of the ribbon are exposed an equal amount to the polishing action in the uniform feed of the ribbon.

After the ribbon is finished the receiving-reel f may be disengaged from or made loose on its shaft f^3 by withdrawing the engaging device f^{14} , so that the finished ribbon may be rapidly unwound without turning the shaft f^3 .

The operation of polishing is analogous to that of cutting, and it will be understood that the term "polishing device" includes implements sufficiently coarse to have a considerable cutting effect. In the manufacture of watch-springs the herein-described apparatus usually operates on the soft ribbon, rounding and polishing its edges, and the ribbon after being hardened is usually passed through the polishing-machine again in order to put a finishing polish upon it before it is blued by heat.

I claim—

1. In a machine for polishing metal wire or ribbon, the combination of a reciprocating polishing-instrument, comprising a carriage and polishing devices supported thereon, and guides upon which the said carriage has a rectilinear movement, and feed mechanism for drawing the wire or ribbon through the said polishing-instrument, substantially as described.

2. In a machine for polishing metal wire or ribbon, the combination of the following elements, namely: a reel or holder for the wire or ribbon to be polished, a reciprocating polishing-instrument, and pulley around which the wire or ribbon coming from the holder is turned after passing the polishing-instrument, and a feeding device by which the ribbon is drawn back through the polishing-instrument in the opposite direction to that in which it passed from the holder, the polishing-instrument being provided with polishing devices acting on the parts of the ribbon moving therethrough in opposite directions, substantially as described.

3. The combination of a reciprocating polishing-instrument, comprising a carriage and polishing devices having notched or serrated polishing-faces, with feed mechanism for drawing wire or ribbon to be polished through the said polishing-instrument, substantially as described.

4. The combination of the reciprocating polishing-instrument, comprising a carriage and

a polishing device and a holder therefor fixed on the said carriage, and a co-operating polishing device and movable holder therefor, and a spring pressing the said movable holder toward the fixed one, and feed mechanism for drawing wire or ribbon to be polished progressively through between the said polishing devices, substantially as described.

5. In a machine for polishing the edges of metal ribbon, a reciprocating polishing-instrument provided with polishing devices for acting on opposite edges of the ribbon, combined with clamps or guides embracing the flat sides of the ribbon at either side of the polishing devices, for preventing the ribbon from twisting under the pressure of the polishing devices against its edges, substantially as described.

6. In a machine for polishing metal wire or ribbon, the polishing instrument or carriage and polishing devices and their holders fixed thereon, combined with polishing devices and holders therefor movable on guides toward or from the fixed ones, and springs for pressing them against the wire or ribbon between them and the fixed polishing devices, substantially as described.

7. In a machine for polishing metal wire or ribbon, the combination of the following instrumentalities: a reel for holding the wire or ribbon to be polished, and friction device for producing tension thereon, a reciprocating polishing-instrument through which the wire or ribbon is led from the said holding-reel, a pulley beyond said polishing-instrument about which said wire or ribbon is turned and from which it is led back in the opposite direction through the said polishing-instrument, and a receiving-reel and actuating mechanism for rotating the same, whereby the wire or ribbon is drawn progressively from the holding-reel and fed progressively through the polishing-instrument, substantially as described.

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

JOHN LOGAN.

Witnesses:

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H. P. BATES.