

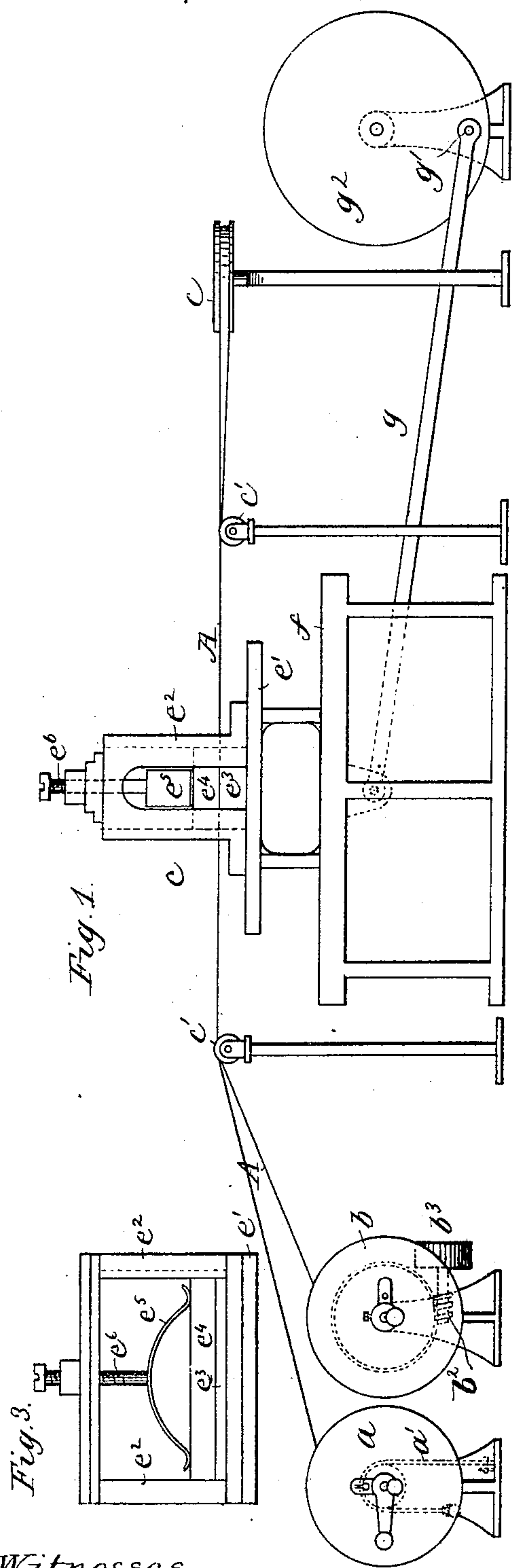
(No Model.)

J. LOGAN.

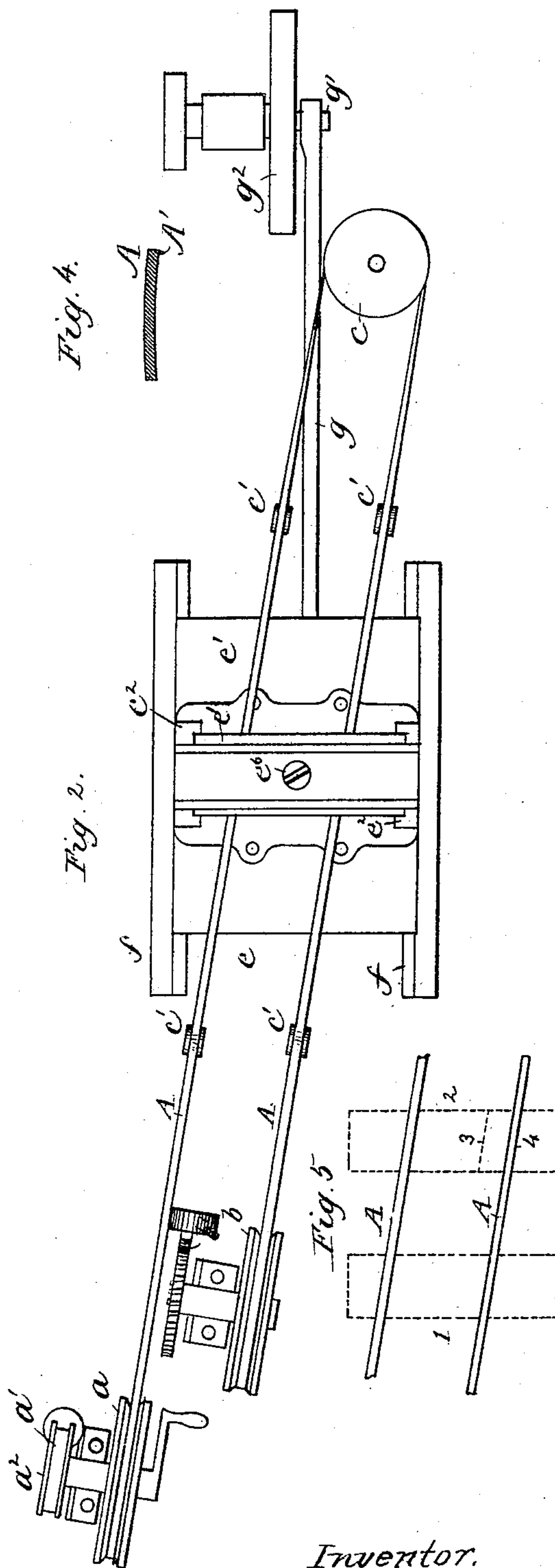
MACHINE FOR TREATING METAL RIBBON FOR WATCH SPRINGS.

No. 342,917.

Patented June 1, 1886.



Witnesses,  
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# UNITED STATES PATENT OFFICE.

JOHN LOGAN, OF WALTHAM, MASSACHUSETTS.

MACHINE FOR TREATING METAL RIBBON FOR WATCH-SPRINGS.

SPECIFICATION forming part of Letters Patent No. 342,917, dated June 1, 1886.

Application filed January 18, 1886. Serial No. 188,935. (No model.)

*To all whom it may concern:*

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

This invention relates to a machine for treating metal ribbon as one step in the process of manufacturing mainsprings for watches.

In another application, Serial No. 159,811, filed March 23, 1885, I have shown and described a machine for filing the edges of the long strips of ribbon that are to be made into watch-springs, and in another application, No. 160,143, filed March 27, 1885, I have shown a machine for polishing the edges of the ribbon, and in Patent No. 328,125, dated October 13, 1885, I have shown and described a machine for polishing the flat faces or sides of the ribbon.

I have found that the ribbon after it comes from the machines that file and polish its edges, is sometimes slightly curved in cross-section and at some points will have a burr along one or both edges projecting from the flat faces, which curvature and burr interfere with the proper action of the machine for polishing the faces of the ribbon.

The object of the present invention is to produce a machine for flattening or smoothing the ribbon and removing the burr from the edges of the same before it is operated upon by the machine for polishing its faces.

The invention consists, essentially, in a machine provided with means for feeding the ribbon longitudinally from one reel to another and with suitable guides or supports for holding and determining the position of the ribbon as it passes from one reel to the other, combined with a reciprocating carriage having smoothing or cutting devices embracing the flat ribbon between them and reciprocating in a path inclined to the direction of the ribbon passing between them, so that the surface of the polishing-instruments has a movement which is equivalent to the longitudinal movement parallel with the ribbon and also a movement transverse to the ribbon, the effect of which is to remove any parts projecting

from the faces of the ribbon and to tend to flatten the same, both by the direct pressure upon it and by cutting away the projecting parts of the ribbon.

Figure 1 is a side elevation of a machine for treating or smoothing the faces of metal ribbon embodying this invention; Fig. 2, a plan view thereof; Fig. 3, an end elevation of the carriage; Fig. 4, a transverse section of the portion of the ribbon to be acted upon by the machine, enlarged; and Fig. 5 a diagram illustrating the action of the smoothing or grinding instrument.

This machine comprises a suitable holder or reel, *a*, to contain the ribbon *A* to be smoothed, and a reel or feeding device, *b*, for drawing the ribbon off from the reel *a* and presenting its different parts progressively to the action of the smoothing-instrument, the said ribbon preferably passing over a pulley, *c*, so that it returns to the reel *b* near the reel *a* from which it is taken, the two parallel portions between the pulley *c* and the reels *a b* being subjected to the action of the smoothing instrument or tool *e*. The said tool consists, essentially, of a carriage, *e'*, having a reciprocating movement in suitable guides, *f*, being shown as actuated by a pitman, *g*, connected with a wrist-pin, *g'*, on a disk, *g''*, which may be actuated by a belt and pulley or any other suitable mechanism.

The reels *a* and *b* and pulley *c* are so arranged that the ribbon *A* passes diagonally across the carriage *e'* at an inclination to the path of movement thereof on the guides *f*, as clearly shown in Fig. 2.

The carriage *e'* is provided with uprights *e''*, which form holders for the grinding or cutting block *e'''*, which may be composed of emery or corundum or other suitable material made in the usual manner, having a flat upper surface, upon which the under surface of the two portions of the ribbon *A*, extending from the pulley *c*, lies, and above the said ribbon is a similar stone or grinding instrument, *e''''*, which may be pressed down upon the upper surface of the ribbon by a spring, *e'''''*, the force of which may be regulated by a screw, *e''''''*, or other adjusting device. The two stones or grinding instruments *e''' e''''* thus bear upon and rub over the opposite faces of the ribbon as the said carriage is reciprocated, and owing to the inclination of the ribbon to the path of move-



ment of the stones the ribbon has an apparent lateral movement with relation to the surface of the stone as the latter moves lengthwise, or nearly so, with relation to the ribbon, so that at each stroke of the carriage  $e'$  a portion of the surface of the stone, which is several times the width of the ribbon, acts upon the ribbon, and the effect on the surface of the ribbon is much the same as if the stones reciprocated with a shorter stroke at right angles to the length of the ribbon, such movement being effectual in taking off the projections or burr  $A'$  projecting from the faces of the ribbon, and when, for instance, the latter is curved, as shown in Fig. 4, the upper stone will act upon the central convex part of the ribbon, while the under stone will act on the part near the edges, the result being to bring the ribbon to true flat surface on both sides. This result could not be effected if the instruments moved parallel with the ribbon, as the cutting-surfaces would then act only in a line equal to the width of the ribbon, which would soon cut a depression in the said surfaces, so that they would no longer act, and if it were attempted to reciprocate them at right angles to the ribbon, in order to get the proper action to remove the projecting parts of the surfaces, the ribbon would not have sufficient strength to resist the movement, but would either be carried back and forth with the cutting-surface, which would then have no effect or would be broken off.

The action of the stone on the ribbon may be best understood from Fig. 5 which shows that while the stone has moved from 1 to 2, the ribbon has been acted upon by the entire surface between 3 and 4. When the instrument moves in a path inclined to the length of the ribbon, as shown, it has a slight tendency to move the ribbon laterally in one or the other direction; and to prevent this lateral movement the ribbon is carried over grooved guide-pulleys  $c'$ , near either end of the carriage, the flanges of which resist the lateral movement of the ribbon, and thus produce the apparent movement of the cutting-surface transverse to the ribbon. The feeding device or reel  $b$  may be actuated by any suitable mechanism, shown as a worm-gear,  $b'$ , operated by

a worm,  $b^2$ , (shown in dotted lines, Fig. 1,) and pulley  $b^3$ , and the reel  $a$  is provided with a suitable friction device, shown as a weighted strip or belt,  $a'$ , passing over a pulley,  $a^2$ , which resists its movement so as to produce sufficient tension on the ribbon. By having the direction of the ribbon reversed by the pulley  $c$ , the drag of the grinding-surface is balanced, and has no tendency to move the ribbon lengthwise or interfere with the proper regular feed thereof.

By making the devices  $e^3$   $e^4$  of sufficiently fine material, this machine may be used to polish the ribbon as well as to smooth or level the same, or remove the irregularities of its surface previous to polishing it upon another machine.

I claim—

1. An apparatus for treating metal ribbon, comprising an instrument reciprocating in a rectilinear path, and feed mechanism which draws the ribbon through the said instrument, the said feed mechanism being arranged with the line of feed inclined with relation to the path of movement of the instrument to cause the ribbon to pass diagonally through the latter or in a direction inclined to its path of movement, whereby the acting surface of the said instrument has an apparent lateral movement with relation to the ribbon, substantially as described.

2. The combination of a reel for holding the wire or ribbon to be polished, a reel and actuating mechanism therefor for drawing the ribbon off from the said holding-reel, and a pulley about which the ribbon is turned to reverse its direction of movement between the said reels, and a reciprocating instrument provided with surfaces acting on opposite faces of the said ribbon between the said pulley and reels, and moving in a path inclined to the direction of the said ribbon between the said pulley and reels, substantially as described.

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

JOHN LOGAN.

Witnesses:

JOS. P. LIVERMORE,  
JAMES J. MALONEY.