

J. LOGAN.
MACHINE FOR FILING METALLIC RIBBONS.

No. 337,689.

Patented Mar. 9, 1886.

Fig. 1.

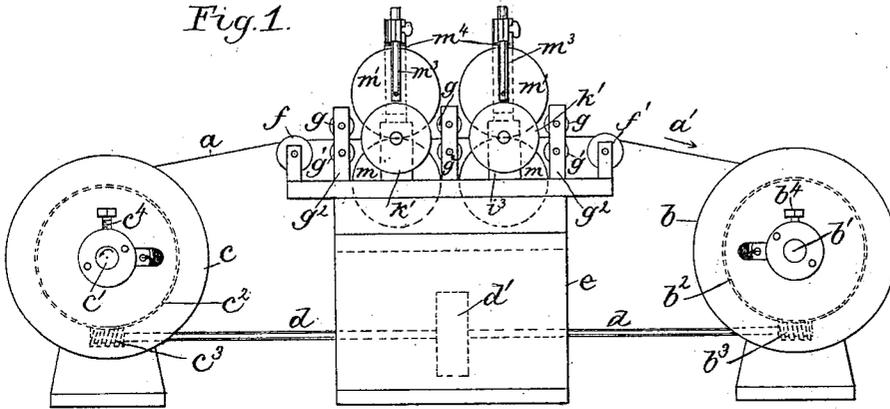


Fig. 2.

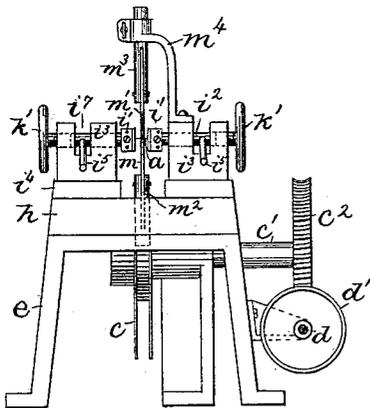
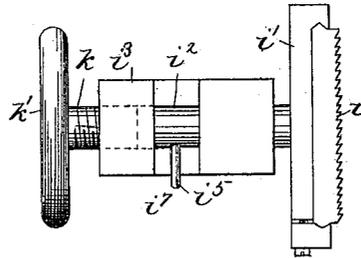


Fig. 3.



Witnesses.
Jas. J. McLaughlin.
H. P. Bates.

Inventor:
 John Logan
 by *Jos. P. Livmore*
 Atty.

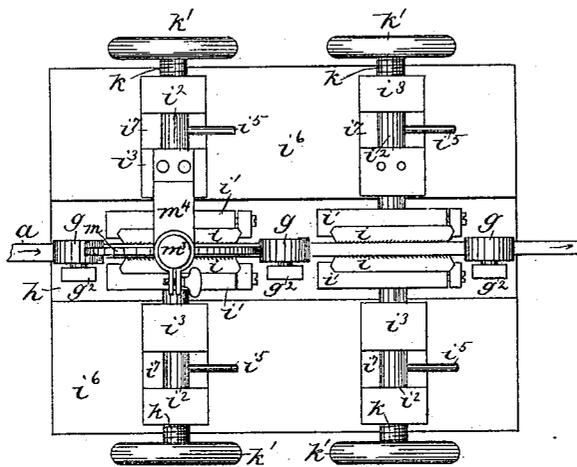
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Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHN LOGAN, OF WALTHAM, MASSACHUSETTS.

MACHINE FOR FILING METALLIC RIBBONS.

SPECIFICATION forming part of Letters Patent No. 337,689, dated March 9, 1886.

Application filed March 23, 1885. Serial No. 159,811. (No model.)

To all whom it may concern:

Be it known that I, JOHN LOGAN, residing in Waltham, Middlesex county, State of Massachusetts, have invented an Improvement in
5 Machines for Filing Metal Wire or Ribbons, 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 filing metal wire or ribbon, being especially intended for filing the edges of ribbon that is to be made into springs for watches, the said ribbon being
15 first cut nearly to the proper width from wider strips of sheet-steel, and then acted upon by the machine forming the subject of the present invention for the purpose of removing the burr from the edges of the ribbon and reducing the same to exactly the desired width, the
20 operation preferably being performed before the ribbon is hardened, tempered, and polished.

The machine comprises in its construction file-holders containing short files, which are held stationary while the machine is in operation, and a reel for the wire or ribbon, or, preferably, two reels, one at each side of said file-holders, and suitable actuating mechanism by which the ribbon is wound upon one of the said reels, being drawn along against the cutting-faces of the files, which act on the edges of the ribbon, cutting them away smoothly and reducing the ribbon to the proper width in this operation. The shafts upon which the reels are mounted are placed at either side of the pedestal supporting the files, and are rotated simultaneously and in opposite directions, and each reel is provided with a clamp or set-screw, by which it may be made fast on its shaft or may be left loose thereon while the ribbon is being unwound from it and wound upon the other reel, which is then fast on its shaft. After the ribbon has been wound wholly upon one reel the latter may be loosened and the other reel made fast, when the ribbon will be drawn back through the file-holding apparatus in the opposite direction, and the said ribbon may be run back and forth in this way until its edges have been cut away the desired amount.

50 The invention further consists in details of construction of the apparatus by which the ribbon is properly guided and supported at

the points where it is acted upon by the files, and by which the latter may be adjusted to cut to greater or less depth, and may be moved
55 from time to time to change the position of their cutting-edges with relation to the ribbon, so that practically the whole surface of the file may act upon the ribbon at different times, instead of having the action confined to a single narrow strip on the file, as would be the case if the position of the latter remained unchanged with relation to the path of the ribbon.

Figure 1 is a side elevation of an apparatus
65 for filing metal wire or ribbon embodying this invention; Fig. 2, an end elevation of the upright or pedestal supporting the files and co-operating devices, the actuating-shaft for the reels being shown in section; Fig. 3, a detail
70 showing one of the files and its holding and adjusting devices in plan view on a larger scale; and Fig. 4, a plan view of the files and their supporting - pedestal and co-operating devices, portions being removed to show the
75 parts beneath.

The wire or ribbon *a* to be filed is shown as being drawn or fed through the apparatus in the direction of the arrow *a'*, Fig. 1, being wound upon the reel or bobbin *b*, supported
80 on a shaft, *b'*, provided with a worm-gear, *b²*, actuated by a worm, *b³*, the said reel being made fast on its shaft by a clamping device or set-screw, *b⁴*, when it is desired to feed the ribbon in the direction of the arrow *a'*, as
85 shown. The said ribbon is drawn off from a reel, *c*, at the other side of the filing mechanism constructed and operated like the one *b*, the shaft *c'* of the said reel being actuated by worm-gear, *c²*, and worm *c³*, the threads of
90 which are of opposite inclination to those of the worm *b³*, so that the said shaft *c'* turns in opposite direction to the shaft *b'*, the clamping device *c⁴* being loosened, so that the reel *c* may turn independently of the shaft *c'* in
95 the opposite direction while the ribbon is being unwound therefrom. The worms *b³* *c³* are on a common shaft, *d*, actuated by a suitable pulley, *d'*, (best shown in Fig. 2,) and the shafts *b'* and *c'* are rotated continuously in
100 opposite directions, owing to the opposite inclination of the threads of the worms *b³* *c³*, the reel from which the ribbon is at any time being unwound being loose on its shaft and turning

freely thereon, the same as if the said shaft were stationary. This construction enables the ribbon to be drawn in either direction, as desired, without reversing the direction of rotation of the shaft *d* and its actuating-pulley *d'*.

The wire or ribbon on being first drawn through the machine by the above-described wire-actuating mechanism may be unwound from another reel supported in any suitable position—such, for instance, as the one upon which it is wound as the ribbon comes from the cutting device by which it was cut from the wide strip of sheet metal in the first instance. The ribbon *a*, passing from the reel *c* or other reel to the reel *b*, is acted upon by the filing apparatus shown as supported upon a pedestal, *e*, the said ribbon first passing over the guide-pulley *f*, corresponding with a guide-pulley, *f'*, at the other side of the pedestal *e*, the said pulleys *f f'* causing the said ribbon to be presented to the filing devices at the proper level, the said guide-pulleys *f f'* also being flanged to prevent lateral movement of the ribbon, which thus always keeps the same position between said pulleys during its feed movement. The ribbon also passes through a series of pairs of guide-rollers, *g g'*, having bearings on suitable uprights, *g²*, from the pedestal *e*, or a bed-plate, *h*, fastened thereon, the said rollers keeping the ribbon flat or horizontal, so that the files *i*, (see Figs. 3 and 4) having their cutting-faces vertical or at right angles to plane of the ribbon, will cut the edges of the latter squarely or at right angles to its broader surfaces. The files *i* are supported on suitable file-carriers, consisting of clamps or holders *i'*, each having a stem or shank, *i²*, supported in uprights or brackets *i³*, shown as projecting from plates *i⁴*, fastened upon the bed-plate *h* and pedestal *e*. The shanks *i²* and their sockets in the uprights *i³* are cylindrical, and the said shanks are provided with a lateral arm or handle, *i⁵*, by which they may be turned, so as to present the faces of the file *i* at different positions with relation to the ribbon passing along them, or to reverse each file end for end, so as to present its cutting-edges in proper position to act on the ribbon *a* when moving in the opposite direction, or from the reel *b* to the reel *c*. Thus, by moving the handle *i⁵* and connected file-holder through various small angles, the point of contact of the ribbon with the file may be varied, the said ribbon passing either directly across the file *i* or diagonally across it at various angles, and by moving the file up and down in its clamp or holder *i'* the part acting on the ribbon may be still further varied until practically the whole surface of the file has been used. The cutting-face of the file is at right angles to the axis of the shank of its holder, so that the movement of the latter, by which different parts of the cutting-face of the file are presented to the wire or ribbon, does not vary the position of the

plane of the cutting-face or "cutting-plane," as it may be called for convenience.

The amount of pressure of the file against the ribbon or the depth of its cut may be adjusted by file-adjusting devices consisting of screws *k*, provided with suitable heads or handles, *k'*, and operating in threaded passages in the uprights *i³*, the said screws *k* operating on the ends of the shanks *i²* of the holders, which latter may thus be moved toward or from the ribbon to regulate the depth of the cut and also to adjust the total amount of action of the files on the ribbon, and thus determine the width of the finished ribbon.

In order to prevent the ribbon from buckling, or from being turned from its position at right angles to the files by the lateral pressure of the latter on the opposite edges of the ribbon, the said ribbon is supported directly between the files by rollers *m m'*, the former having bearings in an upright, *m²*, (see Fig. 2,) supported in the bed-plate *h*, and the latter having its bearings in a pin, *m³*, supported in a bracket, *m⁴*, fastened upon one of the uprights *m²* containing the file-holders. The rollers *m m'* are of less thickness than the width of the ribbon, as shown in Figs. 2 and 4, so that the edges of the ribbon project beyond the said rollers, so as to be acted upon by the files, the rollers having a sufficient bearing on the opposite faces of the ribbon to prevent the latter from turning.

The pin or bearing-piece *m³*, for the roller *m'* is adjustable in the bracket *m⁴* so that it may be caused to bear properly on the ribbon *a*, and by means of the said rollers *m m'*, in connection with the rollers *g g'*, which latter may be wider than the ribbon, the said ribbon is retained flat and prevented from twisting or turning under the pressure of the files.

When it is desired to reduce the width of the ribbon more than can be accomplished by one action of the files, the reel *b*, after the ribbon is all wound thereon, is made loose on the shaft *b'* by disengaging the clamping device *b⁴* from said shaft, and the reel *c* is made fast on the shaft *c'*, so that the ribbon is now drawn in the direction opposite to the arrow *a'* through the filing mechanism, and the position of the file-holders will be reversed by turning the handle *i⁵* about half around in the notch *i⁷*, provided for the said handle in the upright *i³*, thus causing the teeth or cutting-edges of the file to be presented at the proper angle to the ribbon moving by them, and at the same time the adjusting device *k k'* will be operated, moving the file slightly toward the ribbon, so that it will cut the latter and further reduce its width.

In another application, Serial No. 160,143, filed March 27, 1885, I have shown and described a machine for polishing the edges of the ribbon after it has been cut to the proper width by the herein-described filing-machine, and in the said application I have more fully shown and described the construction of the

reels upon which the ribbon is wound, the said reels being substantially the same as the ones, *b c*, shown in the present application.

The machine is adapted to operate on any material in long flexible strips, such material being considered as included in the term "wire or ribbon."

By using a series of pairs of files acting on opposite edges of the ribbon the latter may have its width reduced a larger amount in a single passage by the files than if only a single pair were used, the pair nearest the reel toward which the ribbon is moving being set closer together than the preceding pair, and thus acting on the ribbon which has already been cut by one or more pairs and reducing its width still further.

By employing files or equivalent cutting instruments which are held stationary in fixed position with relation to the material being acted upon the said material is reduced or cut with extreme uniformity, the files being capable of removing the wider portions of the ribbon and reducing it all to exact uniformity in width without gouging out the softer portions of the ribbon, as would happen if rotating or other movable cutters were employed.

The invention is not limited to the particular construction and arrangement of the parts shown, which may be greatly varied, and portions of which might be applicable to other machines than the one herein described.

I claim—

1. An organized machine for filing wire or ribbon, comprising a file and actuating mechanism which draws the wire or ribbon along against the cutting-faces of the said file, substantially as described.

2. A file-holding device combined with reels at either side thereof, and actuating mechanism for positively turning one of the said reels, whereby the wire or ribbon to be filed is wound thereon, being drawn off from the other reel and along against the cutting-face of the file, substantially as described.

3. In a machine for filing wire or ribbon, a file-holding device, combined with two reels, one at either side of the said file-holding device, and actuating-shafts for said reels positively rotated in opposite directions, the reels being capable of turning on the shafts independently thereof and provided with clamping devices whereby either one may be made fast on its shaft and rotated thereby to draw the wire or ribbon along the cutting-face of the file, substantially as described.

4. A file-holding device combined with actuating mechanism which draws wire or ribbon along against the cutting-face of the file, and guides governing the position of the part of the wire or ribbon at each moment acted on by the file, substantially as described.

5. In a machine for filing the edges of metal ribbon, a file and holding device therefor, and actuating mechanism which draws the ribbon

along the cutting-face of the said file, combined with pairs of guide-rollers at either side of the file engaging the flat sides of the ribbon and causing its edge to be presented at the proper angle to the file, substantially as described.

6. In a machine for filing the edges of metal ribbon, a pair of files held in position to act on the opposite edges of the ribbon, combined with mechanism for drawing the wire along between the said files, and guide-rollers engaging the opposite faces of the ribbon between the files, substantially as and for the purpose described.

7. In a machine for filing metal wire or ribbon, the combination, with feeding mechanism for moving the wire, of a file, and movable file-holding device by which the file may be moved to vary the part of its cutting-face that acts on the ribbon, substantially as described.

8. The combination, with feed mechanism for moving the wire, of a file-holding device consisting of a clamp provided with a cylindrical shank and supporting-bracket for the said shank, the file being held in the clamp with its cutting-face at right angles to the shank, enabling the latter to be turned to vary the position of the cutting-face of the file with relation to the ribbon without varying the cutting-plane, substantially as described.

9. The combination, with feed mechanism for moving the wire or ribbon, of a file-holding device and file held thereby, and an adjusting device whereby the pressure or cutting action of the file on the wire or ribbon may be regulated, substantially as described.

10. The combination of actuating mechanism for moving a strip of metal ribbon lengthwise with a pair of supporting-rollers of less thickness than the width of the ribbon engaging the opposite faces thereof, the said rollers preventing the ribbon from turning when acted on along its edges at the side of the said rollers, substantially as described.

11. In a machine for filing metal ribbon, a series of pairs of files held in position to act on the opposite edges of the ribbon, combined with actuating mechanism which draws the wire or ribbon along between the said files, substantially as described.

12. An automatic machine for filing wire or ribbon, comprising a stationary file, and actuating mechanism which draws the wire or ribbon along against the cutting-faces of the said file, the cutting action of which is due to the movement of the ribbon, 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,
H. P. BATES.