2 Sheets—Sheet 1.

J. ADT.

MACHINES FOR FORMING METAL RING BLANKS.

No. 180,306. Patented July 25, 1876.

Fig. 1

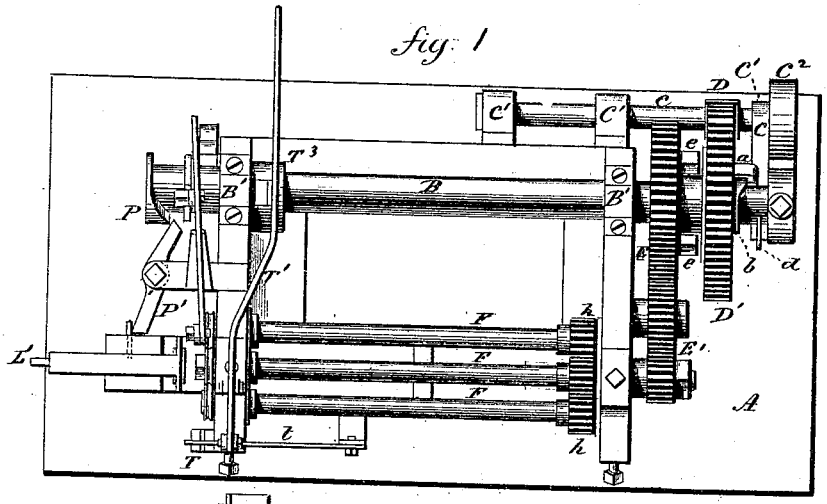

Fig. 2.

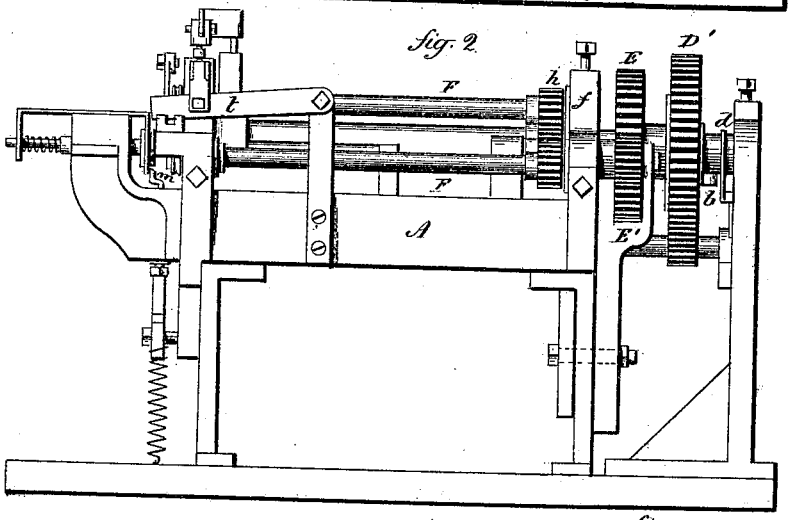

Fig. 3.

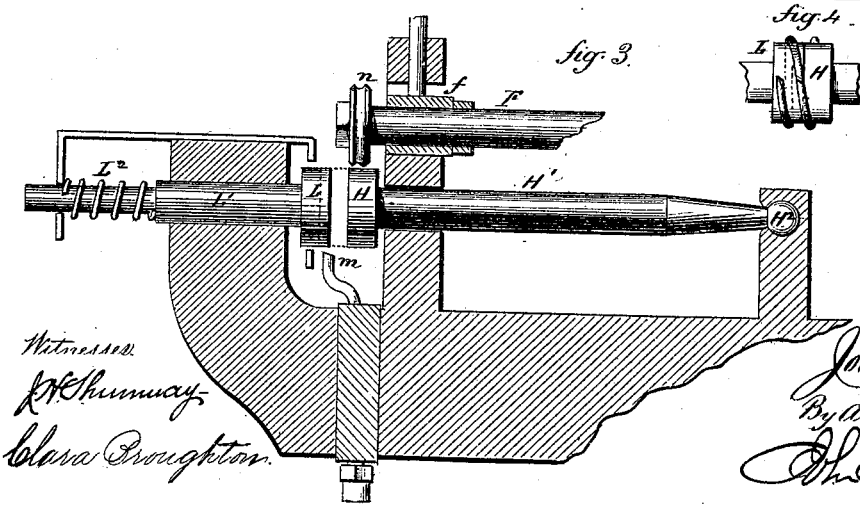

Fig. 4.

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fig. 5

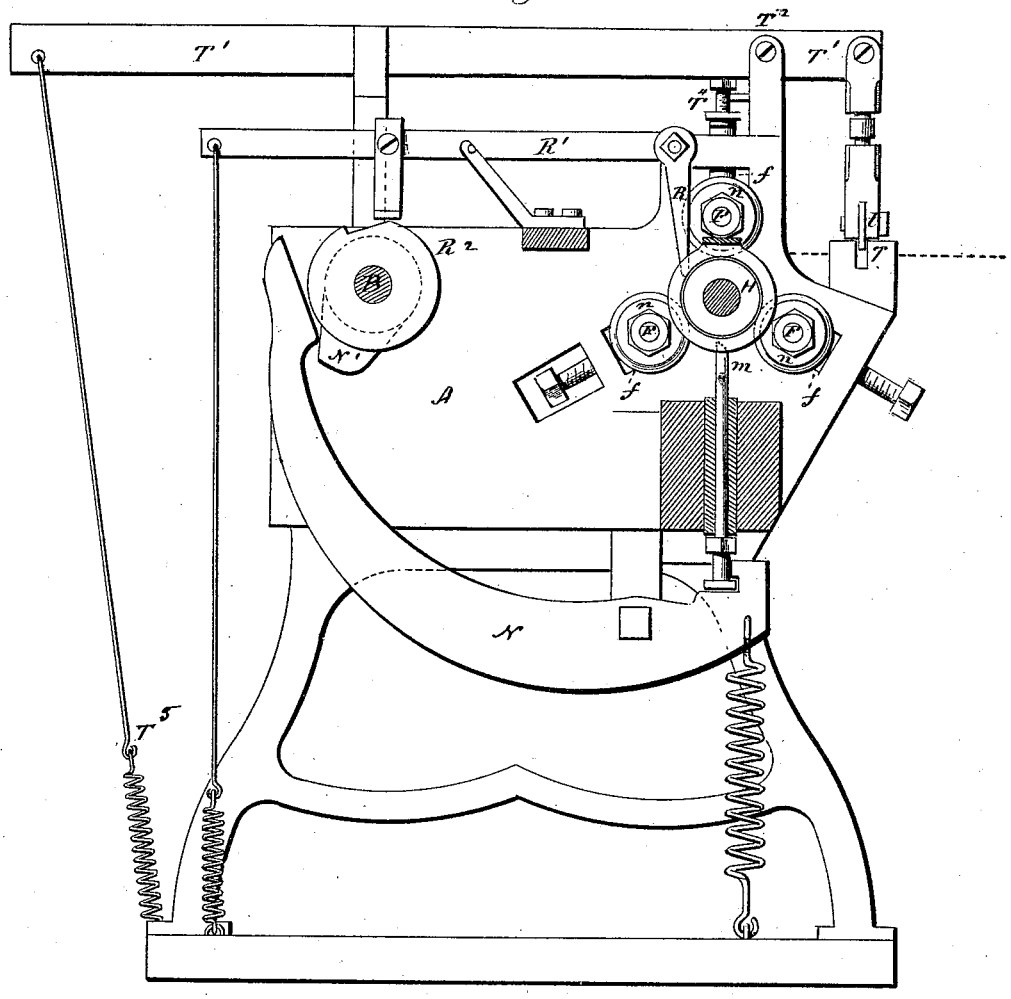
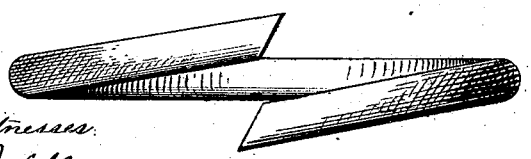


fig. 6



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IMPROVEMENT IN MACHINES FOR FORMING METAL-RING BLANKS.

Specification forming part of Letters Patent No. **180,306**, dated July 25, 1876; application filed January 17, 1876.

To all whom it may concern:

Be it known that I, JOHN ADT, of New Haven, in the county of New Haven and State of Connecticut, have invented a new Machine for Forming Metal-Ring Blanks; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, plan or top view; Fig. 2, front or side view; Figs. 3 and 4, detached views, enlarged; Fig. 5, front-end view, a portion of the mandrel-holder removed to more clearly show the operation; Fig. 6, ring-blank.

This invention relates to an improvement in a machine for forming blanks for metallic rings, one of the blanks as formed by this machine being shown in Fig. 6.

This blank is coiled or bent into a circular or ring form from wire, the two ends cut correspondingly inclined transversely, and left in a spiral relative position to each other. This shows the blank as it comes from the machine, and which completes the operation of the invention.

The blank is subsequently submitted to a process which will bring the two ends together, and secure them by welding, brazing, or otherwise. The invention, therefore, consists in the mechanism as hereinafter described, and recited in the several claims, whereby the wire is drawn into the machine, wound into the required spiral form, and each successive coil cut from the main wire or coil and discharged from the machine.

A is the bed or frame of the machine, upon which the operative mechanism is arranged, and is supported upon suitable legs or foundation. B is the main shaft, arranged in bearings B′, so as to turn freely. C is the driving-shaft, arranged in bearings C^1, and caused to revolve by the application of power thereto through a pulley, C^2, or otherwise. From the driving-shaft C power is communicated through a pinion, D, to a corresponding gear, D′, on the shaft B, so that the shaft B maintains a constant revolution.

Loose upon the shaft B, and near the gear D′, is a second gear, E. Through the gear D′ is a slide or bolt, *a*, which revolves with the gear, and outside the gear D′ is a stationary cam, *b*, which, as the gear D′ revolves, engages with the bolt *a*, and draws it outward or forces it inward, as the case may be. (A spring may be employed to force the bolt inward, a guide, *d*, being here shown for that purpose.)

For reasons hereinafter described the gear E is only required to revolve a half-revolution, and then to stand before the next half. On this gear E there are two lugs, *e*, corresponding to the bolt *a;* hence, when the bolt is thrown inward toward the gear E it will come in contact with one of the lugs *e*, and cause the gear E to revolve with the gear D′ until such time as the cam *b* will draw back the bolt, and thus free the gear E and allow it to remain stationary until the bolt *a* engages the next lug.

F F F are three parallel shafts, arranged in a triangle, as seen in Fig. 5. These three shafts are supported in adjustable bearings *f*, and are connected by gears *h* at one end, so that all revolve together; and they are thus caused to revolve from connection with the gear E through intermediate gears E′. On the outer end of each of these shafts there is arranged a grooved roll, *n*, and between the three rolls is a mandrel or former, H, on an independent shaft, H^1, centrally between the three shafts, and extending back, its rear end supported on a ball or universal joint, H^2, as seen in Fig. 3, the other or former end of the shaft being loose in its bearing, so that it is governed in its position by the rolls *n*, the rolls revolving, and a piece of wire fed to them will cause the wire to be coiled around the former H; and these rolls are set relatively to each other so that the first roll which receives the wire shall be a little in rear of the second roll, and that in rear of the third, so that the wire as it is coiled is guided away from the first roll in its complete revolution, and thus would form a continuous coil if allowed to revolve, and without cutting, substantially like a spiral spring, and as seen on the mandrel in Fig. 4.

L is an auxiliary former, corresponding in diameter to the former H, and in line with it, and so that when the two are set together, as indicated in broken lines, Fig. 3, they form practically one. The former L is attached to a shaft, L^1, upon which is a spring, L^2, the tendency of which is to force the part L of the former toward the part H, and hold it in that position, and in that position the coiling of the wire, as before described, carries the successive coils from the former H onto the part L, as seen in Fig. 4. The half-revolution of the gear E, as before described, imparts to the rolls *n* a movement sufficient to make one complete coil, and then the disengagement occurs, and the rolls and further coiling are stopped. At this time a cutter, *m*, arranged vertically beneath the former, is actuated by a lever, N, through a cam, N′, on the shaft B, and is forced upon the coiled wire, and cuts the wire diagonally, as shown in Fig. 4, thus leaving on the part L of the former only a complete single coil. This done, a cam, P, on the shaft B, through a lever, P′, in connection with the shaft L^1, forces the part of the former L away from the other part, H, and thus removes the cut coil or ring-blank from the other portion, and allows it to fall from the former and away from the machine, complete and ready for any subsequent operation upon it.

In case the ring-blank should adhere to the part L, a trip, R, is arranged upon a lever, R^1, actuated by a cam, R^2, (see Fig. 5,) so as to force the ring from the former and discharge it from the machine. When the ring-blank has thus been discharged the part L is permitted to return to its position, and at that time the engagement with the gear E is made, and the second coil is formed, and passes onto the part L, as before. The wire is passed through a guide, T, as indicated in heavy broken line, and in this guide there is arranged a clamp-bar, *t*, attached to a lever, T^1. This lever is hung upon a fulcrum, T^2, and extends back, and so as to be acted upon by a cam, T^3, on the shaft B, and this cam acts so that at the time when the revolution of the rolls is stopped, as before described, the clamp will be borne down upon the wire, and so as to check it and stop the further run of the wire into the machine; but when the rolls are revolving the clamp will be raised from the wire by means of the spring or weight T^5 on the lever T^1.

When the rolls are revolving and drawing in the wire, a pressure is necessary upon the rolls, or rather upon the first or upper roll, and this is produced by means of the lever T^1 bearing upon a follower, T^4, as seen in Fig. 5. This pressure is, therefore, removed when the lever is actuated to clamp the wire; but so soon as the clamping is released, then the pressure is brought again upon the roll to gripe the wire, so that releasing the pressure of the roll at the same time the wire is griped prevents the possibility of the wire running into the machine by any momentum which might otherwise be imparted to the rolls. This constitutes two checks upon the feeding of the wire, one of which may be dispensed with.

It will be understood that for rings of different diameters a corresponding diameter of former is to be introduced, and the feed-rolls adjusted accordingly.

I claim—

1. The combination of the divided former H L, the rolls *n*, and the cutter *m*, for separating successive coils to form the blanks, substantially as specified.

2. The combination of the divided former L H, the rolls *n*, the cutter *m*, and the trip R, substantially as set forth.

3. The combination of the former H, the rolls *n*, and the clamp *t*, substantially as described.

4. The combination of the former H, the rolls *n*, the loose gear E, with intermediate gearing to connect the said rolls, the principal gear D′, and an automatic clutch, which will engage and disengage the said principal gear, to cause or stop the revolution of the rolls, substantially as described.

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Witnesses:
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CLARA BROUGHTON.