

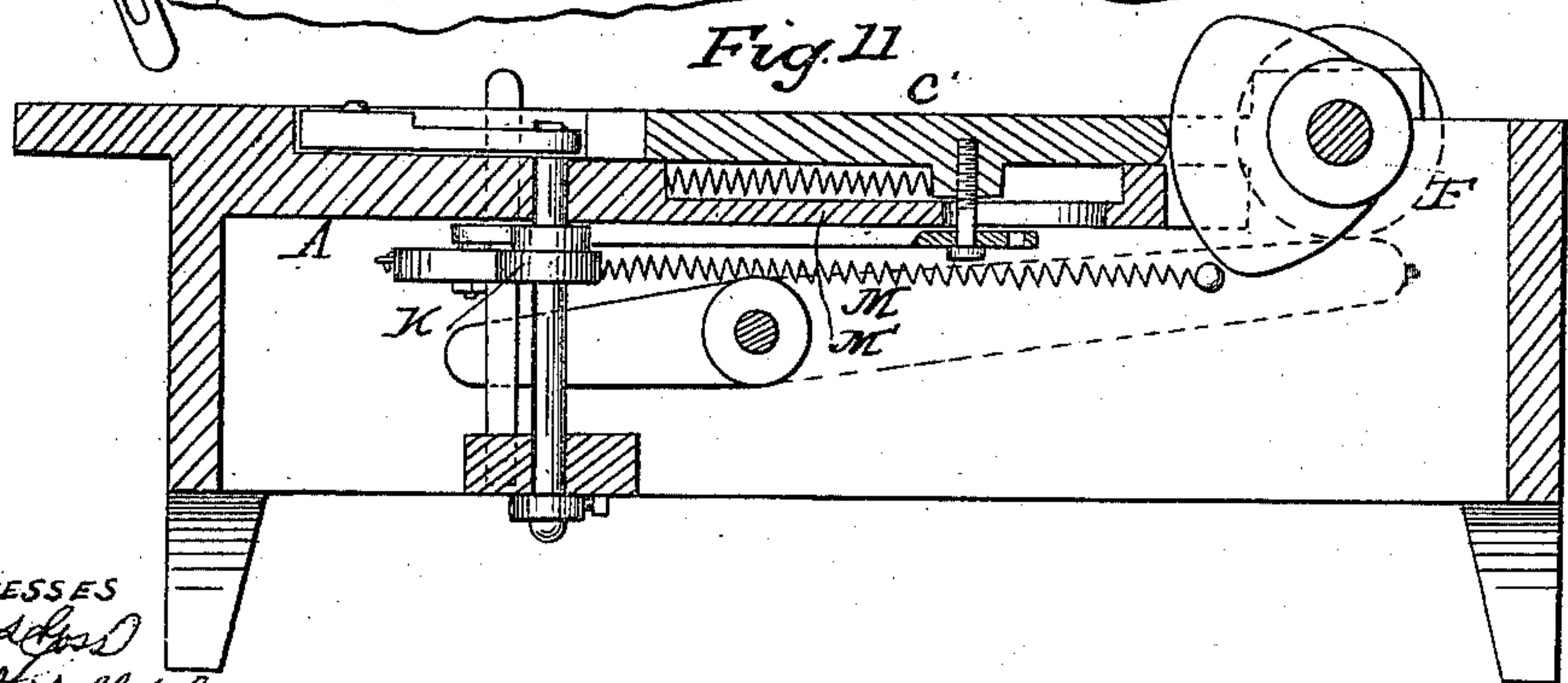
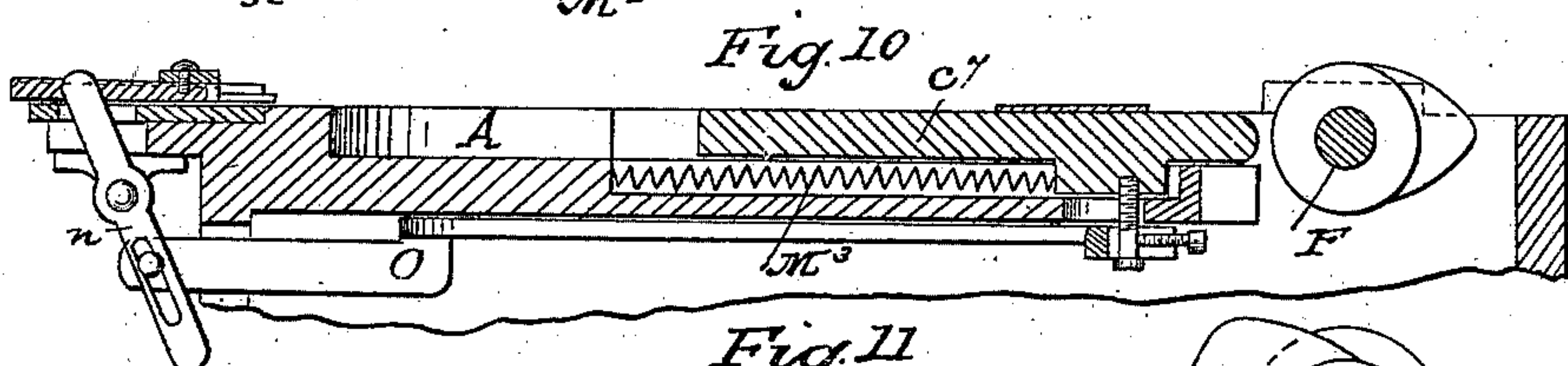
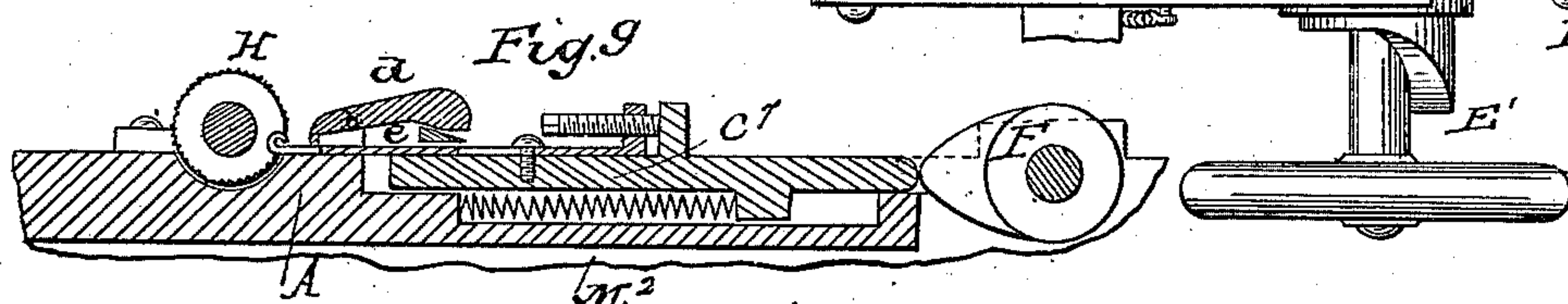
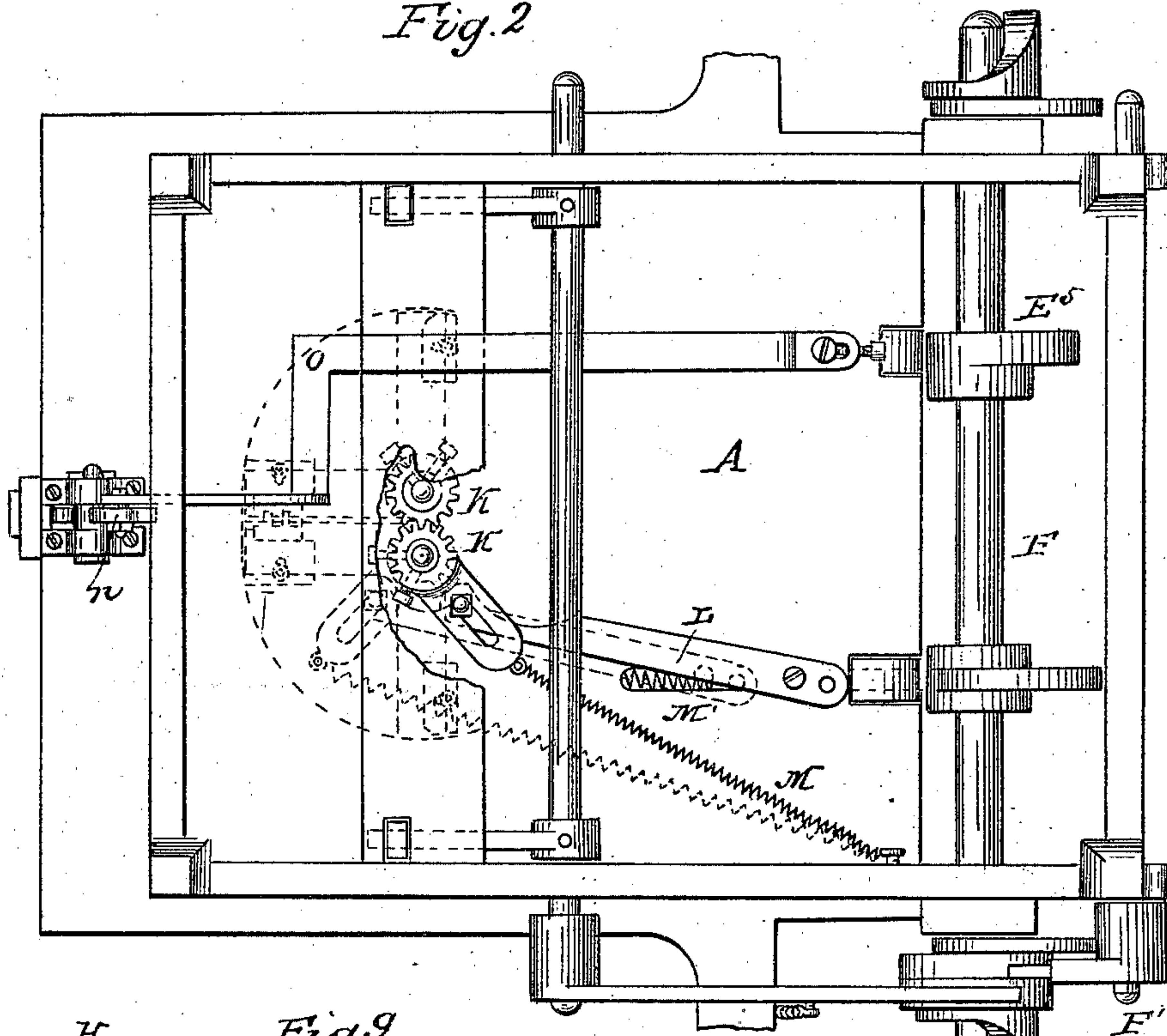
A. RAIS.

Machine for Making Butt Hinges.

No. 66,626.

Patented July 9, 1867.

Fig. 2



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ADRIAN RAIS, OF WATERBURY, CONNECTICUT, ASSIGNOR TO THE SCOVILL
MANUFACTURING COMPANY, OF THE SAME PLACE.

Letters Patent No. 66,626, dated July 9, 1867.

MACHINE FOR MAKING BUTT-HINGES.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, ADRIAN RAIS, of Waterbury, in the county of New Haven, and State of Connecticut, have invented a new and useful improvement in Machinery for Making Butt-Hinges; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings forming part of this specification, in which—

Figure 1, Sheet 1, is a plan of my improved machine for making butt-hinges.

Figure 2, Sheet 2, is a reversed plan or bottom view, showing devices below the bed of the machine for effecting certain movements.

Figure 3, Sheet 1, a bottom view of the vertical box P, detached, showing the guides *h h* for the match-blanks.

Figure 4, a side view of the same.

Figure 5, a vertical central section of the same.

Figures 6, 7, and 8, details of the cap *b* on the milling-disks H, showing the position and form of the guide openings *c c* for the blank-joints.

Figure 9, Sheet 2, a longitudinal vertical section of the slide C³ for pushing the blanks into the milling-disks.

Figure 10, Sheet 2, a longitudinal vertical section of the slide C⁷ for pushing the nails into the knuckle of the match-blanks.

Figure 11, a longitudinal vertical section of the slide C⁴ for effecting the movement of the wings I I.

Similar letters of reference indicate like parts.

This invention relates to improvements in machinery for the manufacture of butt-hinges, and consists in mechanism so constructed and arranged that the two match-blanks of a hinge are conveyed by automatic devices from two feed-boxes or hoppers to the dies for bending the knuckles, thence to the milling-wheels or disks, and thence to a central point, where the leaves of the two match-blanks are joined or interlocked, when another automatic device inserts the nail or rivet, and the butt-hinge is finished and discharged.

My improved machinery, therefore, executes the several parts or processes of manufacture in making butt-hinges by one connected and continuous operation, beginning with the two match-blanks, which are fed into the machine at opposite sides, and ending with the discharge of the butt-hinges complete.

In the construction of my improved machinery for working butt-hinges complete at one operation, by automatic devices which dispense entirely with hand work, I have employed some mechanical devices already in use separately, a part of which devices relates to the bending of the knuckles of the blanks at one single operation, for which I have also applied for Letters Patent, and which are specifically disclaimed in the present application.

As a labor-saving machine, the advantage of this combination of devices for making butt-hinges without manipulation in the several parts or processes of manufacture will be readily appreciated; but I am enabled thereby also to accomplish what cannot be done by hand work. By the old method of matching the right and left blanks by hand they have to be selected for fitting into each other exactly, in order to insert the nail or rivet into the knuckles and to make the joints even and perfect. This work of matching the right and left blanks requires much labor, and many blanks have to be rejected as misfits, and are a loss, while the nail also requires riveting to secure them together.

By my improved machinery the right and left blanks are brought together and matched indiscriminately, so that they shall all fit into each other, and the nail is introduced into the joint and secured without riveting, while the knuckles and leaves are clamped down evenly, and the butt-hinges thus made are all made perfect without any loss of labor or waste of material.

A is the bed for the support of the machinery, and in fig. 1 are represented in plan view the various devices for performing the several different operations or processes required in the manufacture of a butt-hinge, beginning with the vertical feed-boxes B B, placed on opposite sides of the bed-plate for receiving right and left blanks respectively, from which the blanks are drawn out by slides C C, which are actuated by cams E E on

the driving-shaft F. The blanks are then pushed forward in front of the bending dies by arms *a a*, on slides C¹ C¹, operated by side-levers D D, actuated by cams E¹ E¹, also placed on the shaft F, as are all the cams in the machine; and when the blanks are deposited in front of the bending dies, which are not shown in the drawings, they are pushed into them by slides C² C², actuated by cams E² E². The blanks are pressed and held in place while the knuckles are bent by clamps G G, operated on by the long overhead levers D¹ D¹, connected with the rock-shaft F', all of which parts, and their operations severally and jointly, have been particularly described in my application for Letters Patent therefor previously referred to. Thus it will be seen that the mechanism is arranged in pairs or duplicates, the parts on opposite sides of the bed A being similar in construction and operation, and as this plan of the machinery is carried out in nearly all the devices for making the butt-hinges hereinafter to be described, the details of one of the duplicate parts only will be specially described in some cases, and the letters and figures of designation will be the same for the same parts on the opposite sides of the machine. When the blanks have had their knuckles formed by the bending dies they are then moved forward by the arm *a*¹ on slide-bar C¹ in front of the milling-disks H, which are constructed in the usual manner for milling or dressing the joints and bevelling the bottom of the spaces in the knuckles. The milling-disks are covered also by cap plates *b* for protecting them from dust, and under them are openings in the bed-plate to discharge the metal chips. The cap *b* has gates or openings, *c c*, figs. 5, 6, and 7, on the front lower end corresponding with the number of the joints in the knuckles of the blanks in order to admit them. The gates *c c* are made tapering in such manner that they shall act as guides and gauges to regulate the admission of the blanks for the purpose of milling them when they are pushed in to the disks by slide C³, actuated forward by cam E³, and drawn back by the spring M². The blanks are held in place while they are milled by the point of a small lever-clamp, *d*, pivoted on the fore end of slide C³, that receives its clamping movement from an incline on a cross-bar, *e*, by which the rear end of the lever-clamp is raised, when the slide moves forward, as shown clearly in sectional view, fig. 9, sheet 2. Provision is made for withdrawing the blank from the milling-disk by any suitable mechanical device. After the blanks have been milled they are moved forward by the arm *a*² on the slide-bar C¹, to be placed upon the ends of wings or pivoted arms I I, while the wings are open and are in a position in line with the movement of the slide-bar C¹. After receiving the blanks the wings I I are closed by turning on their pivots *g g*, in order to bring the right and left blanks of a hinge facing each other under a box, J, which covers clamping and guiding devices subsequently described. The wings I I are moved by mechanism under the bed of the machine, connected with slide C⁴, actuated by cam E⁴. The operating mechanism of the wings is exhibited in reversed plan view, fig. 2, and in sectional detail, fig. 10, sheet 2. The pivots *g g* of the wings I I pass through the bed-plate, and are affixed to the axes of two segmental toothed wheels, K K, fig. 2, geared together and connected by a rod, Z, with slide-bar C⁴, which gives the wings their closing movement when it moves forward, while their retrograde, or the opening movement of the wings, is accomplished by a spiral spring, M, in conjunction with the spring M', that acts directly on slide C⁴, so that together they draw back the slide-bar C⁴, in order to reverse the gear *g g*, by which the wings I I are directly actuated and opened. The match-blanks are carried from the opposite milling-disks H by the wings I till they meet under the box J, with their joints and spaces in the knuckles facing each other, and on the under side of the box J are guides *h*, for directing the knuckles of the blanks into each other as they are brought together by the wings, as shown in figs. 4, 5, 6. Behind the leaves of the blanks are shoulders *q q*, on the wings I I, which crowd the blanks into the guides, and thus unite the right and left knuckle joints to make a pair of hinges.

The next operation in order is to introduce the wire nail or rivet. For this purpose suitable wire is cut into proper lengths by a pair of shears, *k*, as it comes from rolls N, in the ordinary manner, from which shears the nails are pushed forward into position in front of and in line with the hole in the knuckle of the united blanks; or, instead of cutting the nails off, and feeding them in this manner directly from the shears they can be cut in a separate machine and conveyed from a hopper. The slide C⁵ pushes the nails in front of the match-blanks, and is actuated by the side-lever D. The nail being in position, and lying in a groove in line with the hole in the knuckle-joint of the blanks is then pushed end foremost into the hole by means of a punch, *m*, fixed on the end of slide C⁶, which is pushed by a connecting-rod, O, placed under the bed of the machine, and connected with slide C⁷, actuated by cam E⁵. The rod O is also connected with a lever, *n*, for operating the slide C⁶ and the punch *m*, to push in the nail, as shown clearly in figs. 2, 10, sheet 2. The slide C⁷ is drawn back by a spiral spring, M³, like the slides C³ C⁴, by their springs M¹ M², and all the slides that are actuated by the cams on the shaft F are also provided with similar springs for the same purpose, as shown in figs. 9, 10, 11. After the nail has been pushed into the joint of the blanks, and has thus connected them, the knuckles are then levelled by the compression of a vertical clamp, P, which is operated by the lever D², actuated by cam E⁶. The clamp P is provided with a spiral spring, *p*, to raise it, and the lower end *r* is grooved to fit on the knuckle-joint of the blanks placed directly underneath, as seen in fig. 5.

Now the operation of clamping the knuckle to set and level the joints is a new process in the manufacture of butt-hinges, and as the result is very important in regard to their finish, and economy in the manufacture, this point in my improvements is one requiring especial consideration.

In the first place, as hereinbefore stated, by the ordinary method of coupling the match-blanks in pairs for making a butt-hinge, they are selected to fit each other, in order to insert the nails, and this is done for the reason that the knuckles are closed or bent around entirely in the operation of bending, and the joints do not all agree. By my improved method of manufacture the knuckles are not entirely bent around and closed, but are bent only so far around as to leave the hole in the match-blanks when united large enough to receive the nail easily. And when the blanks are brought together as described under the box J, and within the guides *h*, they are held firmly together by springs *s s*, placed on opposite sides of the box and the guides, while the clamp P is pressed down upon the knuckle-joint of the match-blanks, as shown in fig. 5, sheet 1. By this means the

knuckles of the match-blanks are entirely closed by the lateral pressure of the guides, and the joints are levelled down upon the nail by the vertical pressure of the clamp, so as to make a perfectly smooth-finished butt-hinge, which fits the nail and is superior to any hitherto manufactured. The match-blanks all come together, and therefore none are wasted or lost. As soon as the clamping of the joints is done the wings I I retire to receive other blanks from the milling-disks, and the finished hinges fall through an opening in the bed of the machine into a box or other receptacle below.

The general combined operation of the machinery will be sufficiently understood by the special description of the various parts which has preceded, without further explanation.

Having described my invention, and the mode of performing the same, I claim as new, and desire to secure by Letters Patent—

1. The closing and opening wings I, in combination with the milling-disks H, constructed and operating substantially as and for the purpose herein described.

2. The guide-caps b, in combination with the milling-disks H, and the slides C³, constructed and operating substantially as and for the purposes herein described.

3. The lever-clamps d, and inclined cross-bar e, in combination with the slides C³ and the milling-disks H, constructed and operating substantially as and for the purposes herein described.

4. The clamp P and the guides h, in combination with the wings I, constructed and operating substantially as and for the purposes herein described.

5. The slide C³ and nail-punch m, in combination with the wings I and the guides h, constructed and operating substantially as herein described.

6. The combination of the feed-boxes, bending-dies, milling-disks, closing and opening wings, joint-clamp, knuckle-guides and nail-punch, constructed as described.

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Witnesses:

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