(No Model.)

E. SALOMON.

MACHINE FOR MAKING HINGES.

No. 263,969. Patented Sept. 5, 1882.

Fig. 1.

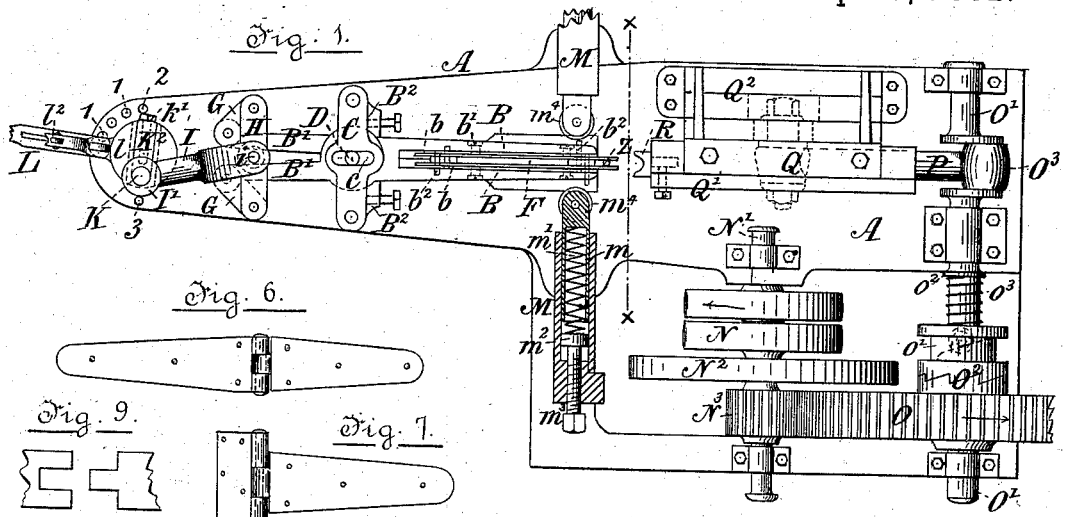


Fig. 6.

Fig. 9.

Fig. 7.

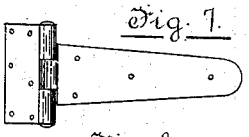


Fig. 8.

Fig. 2.

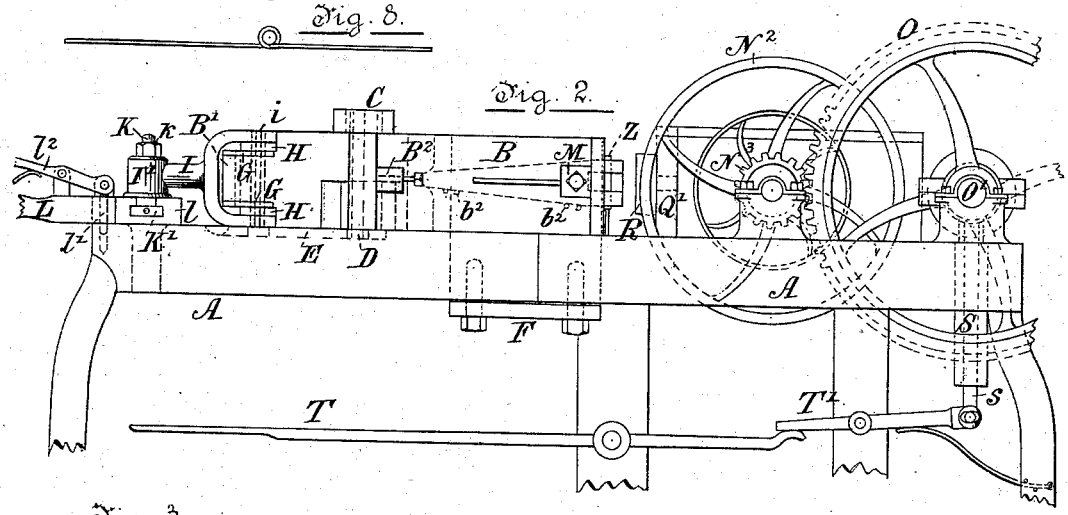
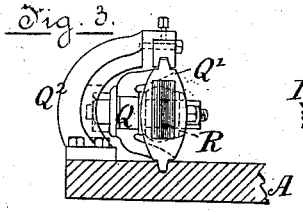


Fig. 3.



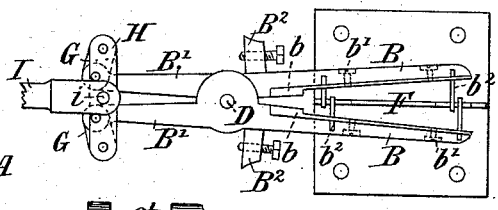
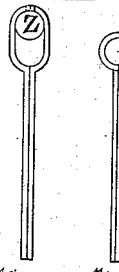


Fig. 4.

Section on line x.x.



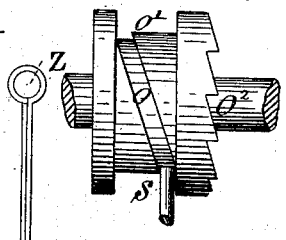
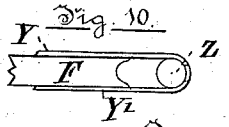


Fig. 5.

Fig. 10.



Witnesses:

J. H. Lewis

F. G. Money

Inventor

Etienne Salomon

Per:

R. A. Nellans

Atty.

Fig. 11 Fig. 12

UNITED STATES PATENT OFFICE.

ETIENNE SALOMON, OF MONTREAL, QUEBEC, CANADA, ASSIGNOR OF ONE-HALF TO EDMOND ARMANT, OF SAME PLACE.

MACHINE FOR MAKING HINGES.

SPECIFICATION forming part of Letters Patent No. 263,969, dated September 5, 1882.

Application filed April 7, 1882. (No model.)

To all whom it may concern:

Be it known that I, ETIENNE SALOMON, of the city of Montreal, in the district of Montreal and Province of Quebec, in the Dominion of Canada, have invented certain new and useful Improvements in the Manufacture of Hinges and Apparatus therefor; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates more particularly to the manufacture of metal strap and T hinges, where the parts are alternately male and female in configuration and have their ends or projections bent round in the form of eyes, through which the pivot-pin is passed and riveted therein; but it must be understood that my machine is applicable to hinges of all descriptions, with such slight modifications as would not depart in any way from my invention.

It has for its object, first, to make the hinges more perfect and durable and at a less cost than those manufactured by the present means; second, to prevent the great waste (which it is now impossible to avoid) produced by the breaking of the metal at those parts which are bent to form the eyes for the pin, and consequent loss of time and material; third, to make it possible for metal of an inferior or cheaper quality to be used without detracting from the merits of the hinge, and, fourth, to lessen the time required to turn out the complete hinge.

Up to the present time it has been the custom to form the eyes of both the male and female parts of the hinge by rolling each upon a mandrel separately, after which they are fitted together and the pivot-pin driven through and riveted at either end. Should the pins therefore be of uneven diameter or crooked, as is very often the case, some of the hinges will be too tight and others too loose. In the former case it is necessary, as the eyes are forced open in driving the pin through, to put the hinge through another operation to remedy the defect, while in the latter instance a slack, imperfect, and necessarily weak hinge is produced. Again, by the present inaccurate mode of manufacturing, when the hinge is formed it often happens that the joint is not true and the ends of the two straps do not come in a straight line with each other. This necessitates one part being hammered sidewise, which loosens the hinge and renders it otherwise unserviceable. Many other imperfections appear in hinges manufactured by the known machines which it is not necessary to describe; but my invention obviates every possible chance of any but a perfect hinge being turned out, and performs the work rapidly in one operation.

I place my blanks in pairs (one male and one female) between gripping-jaws, and put the pivot-pin between their ends in position to be inwrapped by the eyes. I then feed same forward, so that they may be struck on their ends by a punch or former fed from the opposite direction, which gives the metal a curve equivalent to about half a circle around said pin, which bears against the concave end of a division-plate located between the gripping-jaws. By another movement immediately following I advance the blanks and pin thus connected farther out and away from the bearing, and a second stroke from the punch drives or bends same back again against the concave edge of the division-plate, which thus forms an anvil and completes the hinge by folding the ends of both male and female parts in the form of circular eyes around the pivot-pin, which can then be riveted in place.

For full comprehension of the invention reference must be had to the accompanying drawings, in which letters similar to those used in the following description denote like parts in all the figures.

Figure 1 is a plan view, partly in section, of a machine embodying my invention. Fig. 2 is a side view of same; Fig. 3, a section taken through bed-plate on line X X, Fig. 1, looking toward rear of machine; Fig. 4, a plan view of gripping-jaws open; Fig. 5, a detail view of clutch and device for throwing same in and out of gear; Figs. 6 and 7, views, respectively, of strap and T hinges; Fig. 8, a side view of strap-hinge finished; Fig. 9, a view of male and female blanks; Fig. 10, a side view of same, with half-turn made around pin; Figs. 11 and 12, views of close-joint hinges made by modifying the machine.

Upon the bed-plate A, toward the front end,

are carried a pair of gripping-jaws, B B, constructed somewhat in the form of and opening and closing like scissors. These jaws slide back and forth upon the bed-plate or in a groove therein, and are held in position by a strap, C, passing over same and bolted to the frame. In the upper part of this strap a slot, *c*, is formed, in which the end of a pin, D, is held. This pin forms the pivot upon which the jaws open and close, and its lower end slides in a groove, E, formed in the bed-plate A. The jaws B are preferably faced with steel pieces *b b*, as shown in Figs. 1 and 4, to hold the blanks, and are of a shape to correspond with the sizes and styles of hinges to be made, screws *b' b'* being used to secure them in place and allow them to be interchangeable. Small pins or supports b^2 b^2 are also inserted through the jaws B B, near where each end of the blanks will come to support same. The distances apart, &c., of these pins can be varied to suit different lengths and sizes of hinge. Centrally between these jaws B B a division or guide plate, F, is inserted, its lower side being preferably T-shaped and firmly secured to the bed-plate A. This division-plate F is slightly thinner than the diameter of the pivot-pins used for the hinges, and its front edge is made by preference slightly concave. The shorter arms B' B' of the gripping-jaws B B project on the opposite side of their pivot D, and to their extreme ends are pivoted short links G G, the other ends of these links being pivoted to two cross heads or bars, H H, placed one above the other below the shorter arms B' B' of the gripping-jaws and about at right angles to the center line between the latter.

B^2 B^2 are stops cast on the jaws B B near their pivot-point. These are provided with set-screws, as shown. The office of these stops is to prevent the jaws from being drawn back past the strap C, and the set-screws passing through same are to allow the distance of travel back and forth of the gripping-jaws to be adjusted so as to adapt them for different lengths of hinges.

A forked push-lever, I, as shown in Figs. 1 and 2, is pivoted at *i* to and embraces the cross-bars H H, its other end being provided with a hub or eye, I', which is slipped over a vertical spindle, K, and is held securely thereon by a nut and washer, *k*. The lower end of this vertical spindle K is formed with a tongue or cross-head, K', which fits into a groove, K^2, formed in the butt-end *l* of the operating-lever L, an adjusting-screw, *k'*, being provided therefor, as shown, to provide for different sizes of work. The bed-plate A of the machine at this end is preferably of curved or circular form, and projects but slightly beyond where the butt of the operating-lever forms connection with the push-lever I, a series of holes, 1 1, being made around the bed-plate near its outer edge, into any particular one of which a pin, *l'*, attached to a small spring catch-lever, l^2, (which is affixed to and operated by the hand simultaneously with the lever L,) drops when it is desired to lock the said lever in any one position, for the purposes hereinafter described. 2 is the end hole on one side, and 3 that at the other extremity of travel of the operating-lever.

M M are convenient steadying devices, placed one at either side of the jaws B B for the purpose of offering a yielding resistance to the latter when opening and assisting them to close. These steadying devices may not be found necessary; but I prefer to use some such means as those shown in Fig. 1. They are made up of a sleeve, *m*, inside which is placed a spiral spring, *m'*. This spring bears against the solid end of the sleeve on one side, and against a stop, m^2, adjusted by a set-screw, m^3, on the other. A roller, m^4, is placed at the outer end of the steadying device to bear against the side of the jaw B, and thus avoid friction. The whole device is carried in any suitable standard or bearing affixed to the frame of the machine.

The above is a description of the mechanism for holding the hinge-blanks and feeding the same toward the punch or former, and I will now describe the construction of the said punch and the devices operating the same.

Power is communicated through a pulley, N, mounted on a short shaft, N', carried in bearings in the frame A. This shaft N' also carries a balance-wheel, N^2, and a spur, N^3, which intermeshes with a pinion, O, mounted on another shaft, O', carried in a similar manner to N' and parallel thereto, but with another journal. A clutch, O^2, with means, to be hereinafter more particularly described, for throwing same in and out of gear, is used to regulate—*i. e.*, to start and stop—the movement or revolution of the shaft O', the same being mounted on said shaft, which extends right across the bed-plate A, and is provided at about the center with an eccentric or crank, O^3, to which is attached a connecting-rod, P, joined to a cross-head, Q, secured to a sliding frame, Q', held in a guide-frame, Q^2, bolted to the bed-plate A. The sliding frame Q' holds in its front end the punch or former R. This punch or former is preferably made of hardened steel, and concave on its face, so as to give the required form to the hinge. It is held in place in the head of the sliding frame Q' by a bolt or set-screw, or any suitable means. The size and configuration of the punch can be altered to suit the different work it has to accomplish.

I will now describe the means by which I operate the clutch O^2. This clutch is supposed to be thrown out of gear with the pinion O when the crank O^3, connecting-rod P, and punch R are drawn back, and is intended to be thrown into gear just before each primary stroke of the punch is made. This is accomplished by forming a cam-groove, *o*, in the collar *o'*, which forms the sliding part of the clutch, and against this collar and a collar, o^2, on the shaft O' bears a spiral spring, o^3, surrounding said shaft. The cam-groove *o* ex-

tends only about half-way round the collar o', and a pin, s, carried and sliding up and down in a sleeve, S, which hangs downward from the frame, fits into this groove o, it being thrown out of same by means of a system of treadle-levers, T T', extending underneath the framing. These devices are shown in Figs. 1, 2, and 5.

The operation of my invention is as follows: In Fig. 1 the gripping-jaws B B are shown closed with the hinges between them; but to open these jaws (to the position shown in Fig. 4) to remove said hinges when complete, and to insert fresh blanks, I raise the pin l' from the hole in the bed-plate, in which it is shown in Fig. 1, by depressing the spring catch-lever l^2 with the hand, and then move the operating-lever smartly around to the left, and by releasing the spring catch-lever drop the pin l' into the hole marked 2. This operation induces the push-lever I to draw upon the cross-bars H and pivot i, and thus, through the links G G, close the arms B' B' together, and thus open the gripping-jaws B B. I then insert a pair of blanks, Y Y', one male and one female, by resting same upon the support-pins b^2 b^2 and hold the pin (represented by Z in the drawings) in place on a stop, or in suitable guides which may be attached to the bed-plate, and then release the locking-pin from the hole 2 and bring the lever back to the position shown in the drawings, again dropping the locking-pin. This closes the jaws B B and holds the same firmly in place. When in this position, as shown in Fig. 1, the pivot-pin Z is held tightly between the ends of the two parts of the hinge, although the same are not close up against the division-plate F, from the fact, as already mentioned, that the pin is thicker than this division-plate. By depressing the treadle T the pin S is released from the cam-groove o in the clutch, and the latter is then forced by the spring o^3 into gear with the pinion O. The shaft O' is thus set in motion and the crank O^3, through the connecting-rod P and sliding frame Q', forces the punch R smartly against the projecting ends of the blanks and gives them the half-turn around the pivot-pin Z, as shown in Fig. 10. By the continued revolution of the shaft O' the punch recedes, and before it again advances (without stopping the machinery) I move the operating-lever L sharply around to the right and drop the locking-pin l' into the hole marked 3. This has the effect of forcing the gripping-jaws B and the partly-formed hinges and pin held therein still farther forward, away from the division-plate F, the pivot-pin D of the jaws sliding in the slot c, formed in the strap C. On the next stroke of the punch R the ends of the blanks are turned completely around the pin Z, which is also forced back against the end of the division-plate F, and with the assistance of the latter the hinge is completed. I then release the treadle T, which allows the pin S to fly upward and again enter the cam-groove o on the clutch, and by this groove working around on said pin to that side which is farthest from the clutch O^2 said clutch is thrown out and the shaft O' ceases to revolve and the punch stops operating. The operating-lever is then moved around and locked in the hole 2 and the finished hinge removed. Fresh blanks can then be inserted and the operation repeated.

In making "butt" or close-folding hinges I may form a cavity or mold at the front ends of the gripping-jaws, and by means of a suitable former attached to the sliding frame Q' strike the blank into the form shown in Fig. 11; or this work may be done by a separate machine, if desired, after which a pair of these blanks, arranged as shown, with the pin between their ends, may be put between the jaws and the operation completed, as already described, by one blow of the punch. Fig. 12 shows such a hinge complete.

What I claim, and desire to secure by Letters Patent, is as follows:

1. The process of forming hinges by inclosing the blanks and the pin within gripping-jaws, and in forcing the blanks around the pin by means of a former, substantially as described.

2. The process of making hinges, consisting in first inclosing the blanks and pivot-pin between gripping-jaws, bending the said blanks partly around the pin by means of a former, moving the gripping-jaws and partly-formed hinge forward, and finishing the hinge by the succeeding blow of the former against a concave anvil.

3. In a machine for making hinges, the gripping-jaws B B, having between them the division or guide plate F, in combination with means for opening, closing, and sliding said jaws forward and backward, substantially as and for the purpose described.

4. A machine for making hinges, consisting of a pair of gripping-jaws adapted to receive and hold the blanks, a horizontally-movable former, a concave anvil, and a lever for moving the gripping-jaws and blanks toward and retracting them from the former, the parts being constructed and arranged to operate substantially as described and shown.

5. The combination of the gear-wheel O, having the clutch-sleeve O^2, the movable clutch-sleeve o', the cam-groove on said sleeve o', the pin s, sliding in the sleeve S, and adapted to enter said groove, and the treadle, substantially as described.

ETIENNE SALOMON.

Witnesses:
R. A. KELLOND,
F. G. MOREY.