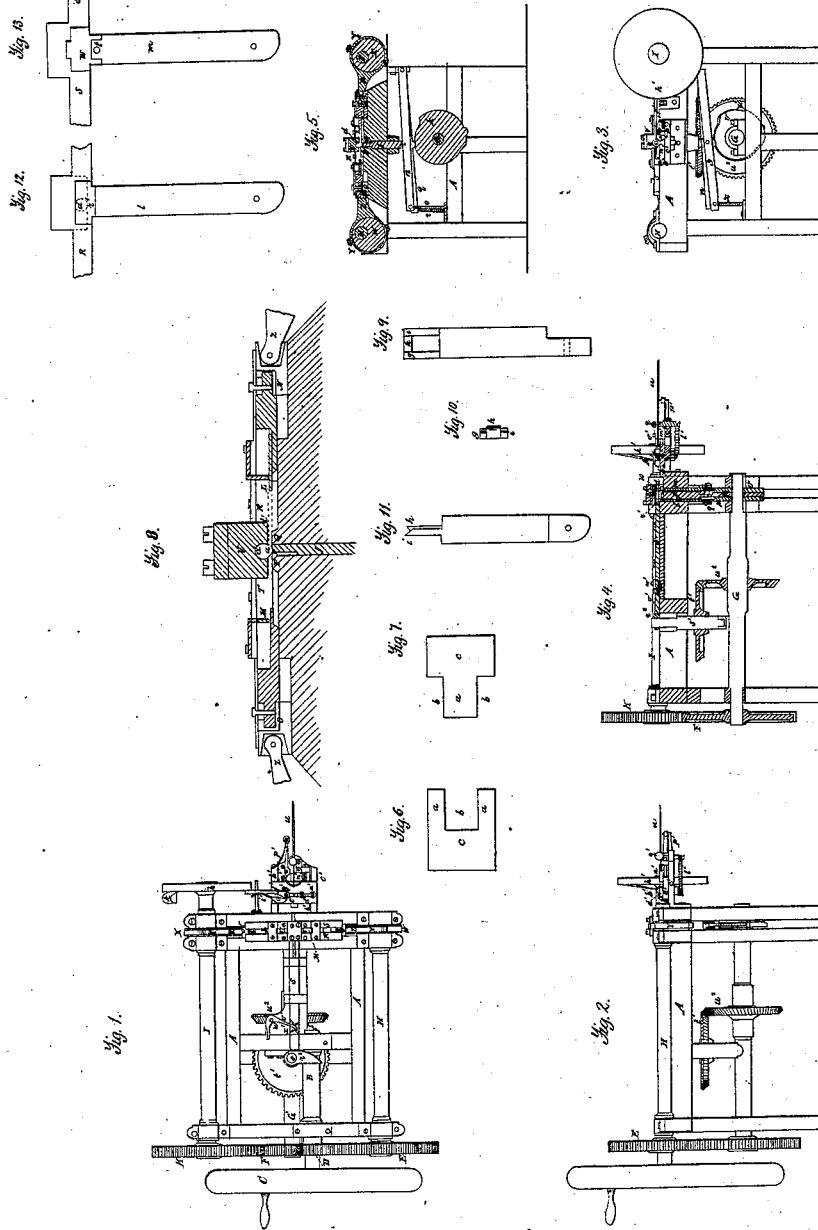


Horton & Armstrong,

Making Hinges,

No. 5,293,

Patented Sep. 11, 1847.



UNITED STATES PATENT OFFICE.

G. H. HORTON AND L. ARMSTRONG, OF HARTFORD, CONNECTICUT.

MACHINERY FOR MANUFACTURING HINGES.

Specification of Letters Patent No. 5,293, dated September 11, 1847.

To all whom it may concern:

Be it known that we, GEORGE H. HORTON and LEANDER ARMSTRONG, of Hartford, in the county of Hartford and State of Connecticut, have invented a new and useful machine for making butts or hinges of wrought-iron, sheet-brass, or other metal capable of being bent into the proper shape or form; and we do hereby declare that the same is fully described and represented in the following specification and accompanying drawings, letters, figures, and references thereof.

Of said drawings Figure 1 denotes a top view of said machine—Fig. 2 is a side elevation of it. Fig. 3 is an elevation of the end opposite to that at which the power to drive the machine is applied. Fig. 4 is a central longitudinal and vertical section of it. Fig. 5 is a vertical and transverse section taken through the dies, to be hereinafter described. Such other figures as may be necessary to a full description and representation of the operative parts will be duly specified.

The metal to be converted into hinges is first stamped or cut out, in the shapes denoted in Figs. 6 and 7—that is to say with one or more tongues *a, a, a*, and corresponding spaces *b, b, b*, the portions *c, c*, constituting the leaves of the butt, while from the said parts *a, a*, the joint of the hinge is made, their parts being brought together (in such manner that they enter, and fit or fill the spaces *b, b, b*), and bent around a piece of wire or pin which serves to connect them together, and complete the joint of the hinge.

A in the figures denotes the frame work of our machine. It may be made of the shape exhibited in the drawings or in any other proper manner.

B is the main driving shaft carrying a fly wheel C. It has a cogged pinion D fixed on it, which engages with two toothed gears F, F, the lower one F of which is placed on the end of the main cam shaft G, while the former or upper one, is fixed on the eccentric shaft H. There are two of said eccentric shafts viz H and I, are arranged in the positions as seen in Figs. 1, 2 and 3. The latter (I) receives its motion through a toothed gear K fixed on it, and made to engage with the gear F, before mentioned.

The mechanism which we shall now proceed to describe, consists of the impelling slides, the main or joint die, the turning dies the anti spreading plates, the wire severer or

cutter, the wire feeding apparatus, and the hinge discharging apparatus, or that by which the hinge is expelled from the dies, after they have completed their action. The impelling slides are composed of two straight rectangular and flat pieces of metal or steel L M, each of which is attached to one of two adjusting and sliding carriages N, O. The said slides L M rest and move toward and away from one another, on flat beds P, Q, and are guided in their movements between and by two parallel pieces of metal R, S, which compose the sides of receiving chambers T, U, between which the main or joint die V is arranged as seen in Fig. 5 and in Fig. 8, which is an enlarged view of that part of Fig. 5, which exhibits the said die, and the impelling slides, and parts immediately beneath them, together with the turning dies. The impelling slides are driven forward, toward one another, and drawn back at proper times by two eccentrics W X fixed respectively on the eccentric shafts herein before described, a circumscribing strap Y from one of two connecting rods Z Z passing around one of the said eccentrics, while the rod Z is jointed to the carriage of the impelling slide, which plays between guides.

The main or joint die V consists of a block of steel, having a groove *d* cut across it transversely, which groove in its cross section is a segment of a circle, somewhat greater than a semicircle, as seen in the drawings. The diameter of the said segment corresponds to the diameter of the joint of the hinge when completed. The said die, should be made perfectly stationary, or be held firmly in position. The lower surface of it is placed on a level with the upper surfaces of the two impelling slides L, M.

Between the two beds P, Q, the turning die *f*, is arranged. Its object is to slightly bend or curve upward the ends of the projecting parts *a, a, a*, of the plates from which the hinge is to be made, when their extreme ends pass one another, also to remain in the position, while the joint is being made in the main die. The said turning dies elevate the ends of the projections *a, a, a*, so that they will meet the sides of the groove of the die V, and when forced forward, by the impelling slides, be compelled to bend around in said groove into the shape required. The posi-

tion of the said turning die, with respect to the main die, and impelling slides, when the operation of bending is being performed, is exhibited in Fig. 8, wherein the central part *a* (Fig. 7) is denoted (by red lines) as bent upward by the turning die, and in the act of entering the main die V. Fig. 9 is a side view of the said turning die. Fig. 10 a top view of it, and Fig. 11 an end elevation of it. It consists of a slide or bar having three inclined planes *g*, *h*, *i*, upon its top, two of which *g*, *i*, run in one direction while the third or middle one (*h*) runs in an opposite direction. The said slide or die is operated or elevated by a cam *h* fixed on the cam shaft G. It is depressed by a lever *n*, and spring *o*, the slide being jointed to the lever.

The anti spreading plates, consist of two sliding plates *l*, *m*, arranged with respect to the block V, as seen in the cross section Fig. 4. A vertical and longitudinal section of the plate *l*, and the side bar R, is exhibited in Fig. 12. A similar section of the other bar *m*, is given in Fig. 13. The bar *l* is raised by a cam *p*, fixed on the shaft G. It is depressed by a lever *q*, and spring *r*, the bar being jointed to the lever. The object of the bar is to prevent the plates of which the hinge is composed, from spreading laterally, when the joint is being made. The purpose of lowering the slide *l* is to depress it below an opening *r'* made through the bar R, R, for the discharging slide S to pass through, when put in action so as to discharge the hinge from the dies, after it is made. The other slide *m*, not only is operated like the first one (*l*) and answers a like purpose, but is also intended to cut or separate the piece of wire, inserted between the two parts of the hinge, from the remainder of the feeding wire. For this purpose the slide *m*, has a hole *t*, bored through it, of a size just sufficient to receive the wire *u*, Fig. 1, and allow it to be passed through it. Soon after the hinge has been formed on the wire, a projection *u'*, on the cam *v* raises the slide *m* up, in such manner as to break off or sever the wire at the hinge. By means of a spring *x*, and lever *y*, the slide *m*, is afterward retracted or drawn downward, far enough to allow the hinge to be driven (by the slide S) through an opening *w* made through the side bar S; the slide *m* being jointed to the lever *y*.

The wire feeding apparatus, is that, which is next in order to be described. *a'* is a carriage resting on guide rails *b'*, *b'*, arranged and sustained on a platform *c'* as seen in the drawings. This carriage supports two jaws *d'*, *e'*, the former of which is made stationary and immovable on the carriage, while the other is made on the end of a lever *f'* which moves horizontally on the fulcrum *g'*, and is borne toward a cam wheel *h'*, by a spring *i'*. The said cam wheel is fixed on

the eccentric shaft I, and has a cam *h'* on it, which should be so arranged, and made as at the proper time, (while the said wheel *h'*, is being revolved) to press against the lever *f'*, and throw or cause the carriage to move forward toward the dies.

The retreat of the carriage is effected by a spring *l'*, properly applied to it, and the platform *c'*. There is a pair of nippers *m'*, *n'*, fixed on the platform *c'*, in rear of the carriage, as seen in the drawings. One of these nippers is fastened to the platform, while the other is made movable on a fulcrum *o'*, the jaws of the said nippers, being kept together, or pressed toward one another, by a spring *p'*, properly applied to the tail of the nipper *m'*, and to the platform. The feeding wire *n* after passing through a guide post *q'* is carried between the jaws of the nippers *m'*, *n'*, and from thence, between the jaws *d'* and *e'*, the hole *t* of the slide *m*, and through the central or middle part of the die of the block V. This being done, whenever the carriage retreats, the nippers *m'*, *n'*, will so grip the wire, as to hold it firmly and still, while the carriage moves back. The jaws *d'*, *e'*, will then slide over the wire. But when the carriage advances toward the dies the jaws *d'*, *e'*, will be caused (by the cam *h'* which acts against the lever *f'*) to grasp the wire so firmly, as to draw it through the jaws of the nippers *m'*, *n'*, and cause it to advance into the main die V.

The hinge discharging apparatus, consists of a side *s*, which is arranged as seen in the drawings, and thrown forward at the proper time, by a cam *r''* placed on the top of a vertical shaft *s'*, revolved by two beveled gears *t'*, *u''*, the former of which is fixed on the shaft *s'*, and the latter on the cam shaft G. The retraction of the slide is effected by a bent lever *v'*, which turns on a fulcrum *w'*, and has one arm, placed in a notch *x'* made on the slide. The other arm of the lever is struck by the cam *r''*, during its revolution, and so as to cause the lever to turn on its fulcrum in such manner as to force back the slide *s*. Soon after the hinge has been formed in the dies, the discharging slide is moved forward against it, and so as to expel it therefrom.

In operating the machine one portion of the hinge (viz that shown in Fig. 7) is placed in the chamber T, while the other, or that exhibited in Fig. 6, is laid in the chamber V. This being done, the machinery should be put in operation, so as to cause the impelling slides, to advance toward one another, and by so doing to crowd the two plates of the hinge together or make them advance with them. The turning die *f* should next be elevated, and in season to cause the ends of the parts *a*, *a*, *a*, of the plates, to meet the inclined planes of it, and

by them be turned upward, into the segmental groove, of the die V. The feeding apparatus should in the mean time advance the wire into the space *d* of the die V. The
 5 impelling slides should continue their advance in such manner as to cause the parts *a, a, a*, of the plates to interlock, and pass around the wire, which they will be caused to do by being forced into the die V. In
 10 the mean time the anti-spreading plates *l, m*, should rise up, so as to prevent any lateral spreading of the metal, and soon after the hinge has been made one of them, viz, *m*, should rise upward and cut off the wire on
 15 the hinge from that without it. This being done the two plates should descend far enough to admit of the expulsion of the hinge from the dies by the slide *s* as before specified. We use over each chamber T or
 20 U a suitable hopper, made so as to contain a vertical pile of hinge plates, the lower one of which will be removed from the pile at each advance of the impelling slide through the chamber. The impelling slide should
 25 retreat entirely out of the chamber or beyond the hopper, so as to allow the pile of hinge plates, to fall and rest on the bed, over which the impelling slide passes. While the slide is forcing any plate forward
 30 toward the bending dies, the plate at the bottom of the pile, or that one which was directly over the one so forced forward, will rest on the top of the impelling slide.

We wish it distinctly understood that we do not intend to confine our invention to the precise forms, and arrangements of mechanism as above detailed, but we mean to vary the same to any desirable extent, while we do not change the combination or principles
 40 we consider new and as our improvements.

We do not claim the invention of the die

V, in combination with one impelling slide and chamber, to receive the half of the hinge, as we are aware that such has been used before, for the purpose of making a
 45 half hinge, for bending it into a proper shape for a joint, but

That which we do claim as our invention, is—

1. The combination of the die V, two impelling slides (L, M,) and chambers T, U, and the turning die *f*, the whole being arranged and made to operate together substantially as above described.

2. We also claim the wire feeding apparatus, in its combination with the dies, or machinery for making the hinge joint, and as arranged, and operating therewith substantially as herein before explained.

3. We also claim the slide *s* or hinge discharging apparatus, as combined with the dies, or apparatus for making the joint of the hinge, and operating therewith as specified.

4. And in combination with the said dies, or apparatus for bending the parts *a, a, a*, of the joint of the hinge, we claim the slides *l, m*, (by which lateral extension of the metal is prevented,) the same being made to operate therewith substantially as specified.

5. We also claim, the combination of the cutting slide (or part which severs the wire) with the bending apparatus, the same being actuated, and arranged as described.

In testimony whereof we have hereto set our signatures this 29th day of March, A. D. 1847.

GEORGE H. HORTON.
 LEANDER ARMSTRONG.

Witnesses:

ISAAC C. PERKINS,
 HENRY PERKINS.