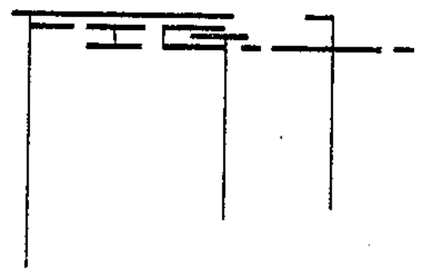
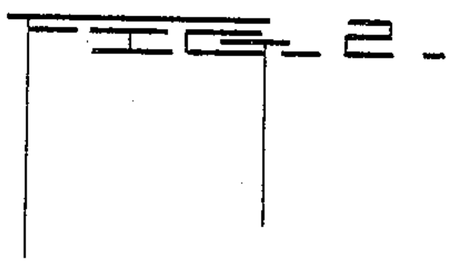
(No Model.)

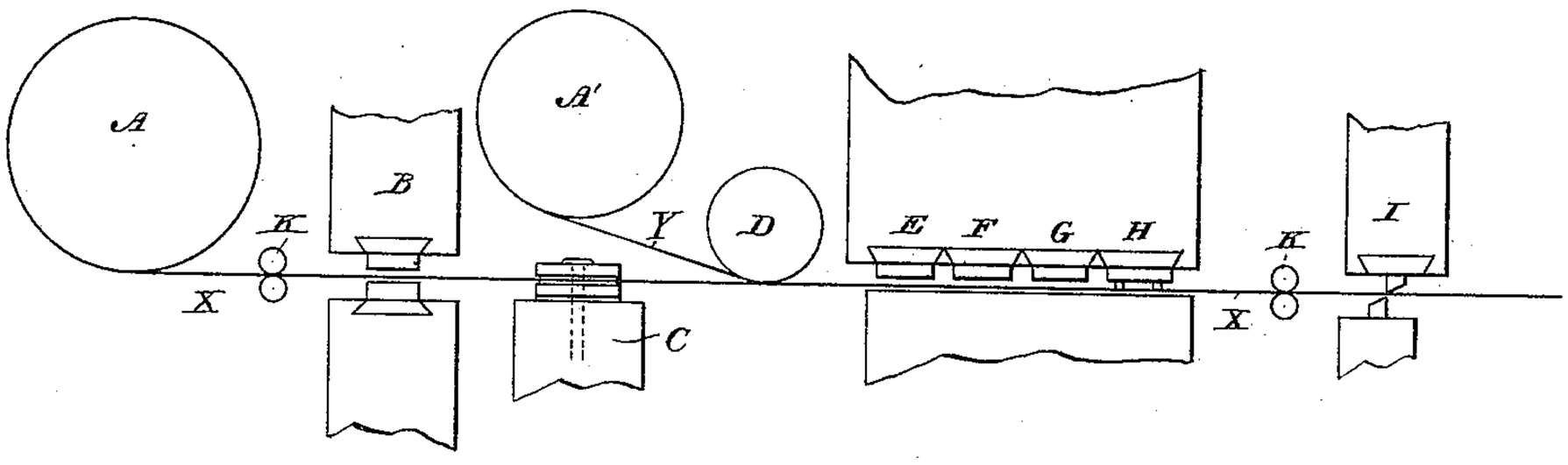
G. P. WHITTLESEY.

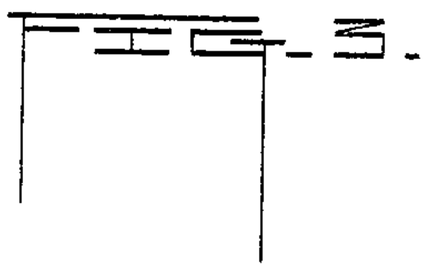
METHOD OF MAKING HINGES.

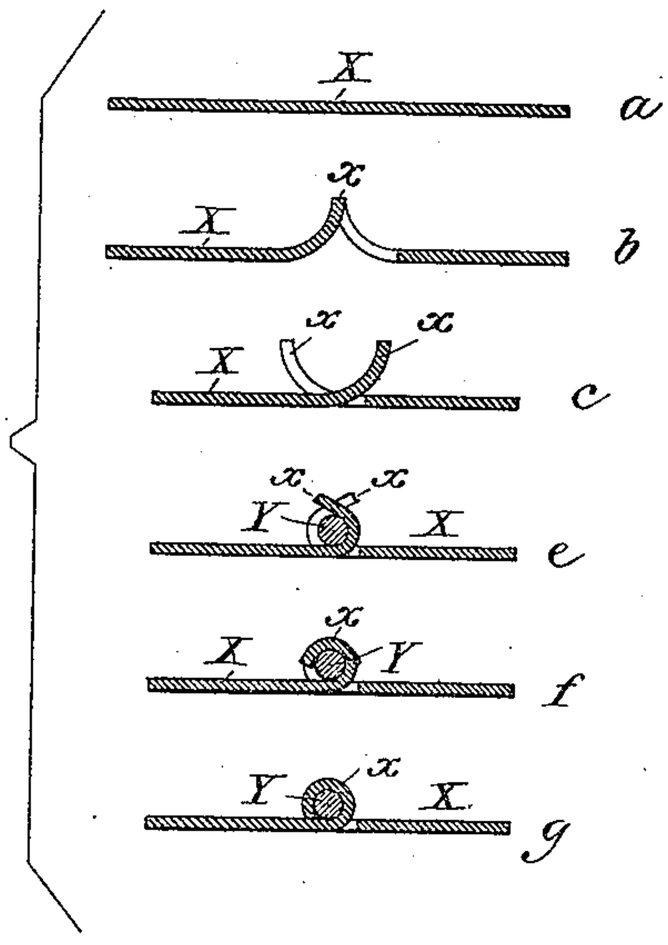
No. 442,656. Patented Dec. 16, 1890.











WITNESSES

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METHOD OF MAKING HINGES.

SPECIFICATION forming part of Letters Patent No. 442,656, dated December 16, 1890.

Application filed July 8, 1890. Serial No. 358,106. (No model.)

To all whom it may concern:

Be it known that I, GEORGE P. WHITTLESEY, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in the Method of Making Hinges; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to hardware; and it consists in an improved method of making hinges, as hereinafter set forth, and particularly pointed out in the claims. It has especial reference to hinges made from ductile metal—such as brass or wrought-iron—wherein the knuckles are formed by turning a portion of the leaf around a mandrel or around the pintle-wire itself. These hinges are commonly known as "wrought butt-hinges," and are usually made of brass or iron, though other metals may be used. Heretofore such hinges have been made by stamping out in a cutting-press the separate leaves, each with suitable projections on one edge to form the knuckles. Machines operating upon the principle of a tinner's brake have been employed to turn the knuckles over a mandrel. The two leaves have then been placed together with their knuckles in line and the pintle-wire driven through and cut off. The screw-holes have then been drilled or punched. This process requires several machines and many handlings of the parts before the machine is completed, and is liable to be wasteful of material. It has also been proposed to feed two strips of metal toward each other, each strip being of a width equal to the length of the proposed hinge. The adjacent ends of the strips have been cut to have the proper knuckle portions, which have then been turned around the pintle-wire, the screw-holes drilled, and the strips severed at the proper distance from the joint to make a single complete hinge. The strips are then fed toward each other again, and the process is repeated. This method requires a complicated machine, a variety of movements to make one hinge, and the length of the hinge is limited to the exact width of the strips which the machine is built to operate upon.

By my method the knuckles are formed upon the adjacent edges of two strips of material, or preferably are punched up along the interior of a single strip. The interlocking or intermatching knuckle portions are then caused to pass by each other transversely of the strip or strips by bringing nearer together the outer edges of the strip or strips. In the trough-like structure thus formed by the upwardly-projecting knuckle portions is laid the pintle-wire, fed from a spool or otherwise. The knuckle portions are then bent around this wire, thus jointing the leaf portions together. The screw-holes are then drilled or punched and the resulting product, which now resembles a long hinge, is cut off at the proper intervals transversely of the pintle-wire, each severed portion being a complete hinge. It is evident that the length of the hinges can be readily changed by changing the interval at which the cutter acts. Moreover, the width of the hinge is variable by varying the width of the strip or strips without changing the machinery. Furthermore, there is no waste of material when the single strip is used. The machinery necessary to carry out the process is simple, and can be arranged to produce a complete hinge at every revolution of the main shaft, since the operation can go continuously on at every point on the strip or strips within the scope of the machine.

In the drawings, Figure 1 is a perspective view showing the several and successive steps in my method as applied to a single strip of material. Fig. 2 is a diagrammatic elevation of a machine for carrying out my method, and Fig. 3 is a series of cross-sections of the strip, showing the several operations to which it is subjected.

When a single strip is used, it is preferably taken from a roll or coil A, the strip having been cut to the proper width to make broad, middle, or narrow hinges, as designed. The strip X passes first between cutting and forming dies B, either reciprocating or rotary, which punch out and bend up the knuckle portions *x*, turning them preferably into a quarter-circle, as shown, with their upper edges in line, or nearly so. I consider it de-

sirable not to bend the portions *x* so far as to disengage them entirely, since the subsequent operation of narrowing the strip might be rendered difficult by the portions interfering with each other when it was endeavored to interlock them. When, however, the bending is done after the cutting and by a separate mechanism, as may sometimes be desirable, it may be found better to disengage the knuckle portions. The essential feature of this part of my method is cutting the knuckle portions so that they alternate with each other and then bending them into substantially an upright position. The next step is to narrow the strip so as to interlock the knuckle portions *x*. This may be done by rolls C, grooved to receive the strip between them by plungers or dies moving transversely to the line of movement of the strip; by stationary guides, between which the strip is drawn or passed, or in any suitable manner. The effect of bringing the edges of the strip nearer together is to cause the knuckle portions *x* to pass by each other and become interlocked, standing in a staggered line on either side of the median line of the strip, as shown in Fig. 1 and at Fig. 3ᶜ.

From some suitable source, such as a spool A′, the pintle-wire Y is led in a continuous length down into the trough-like structure formed by the knuckle portions *x* after they have been interlocked. A presser-wheel D may be used to hold the wire down in place. The strip and wire are then subjected to the action of compressing-dies E F G, or rollers, or brakes, or other suitable mechanism operating to turn the knuckle portions *x* over and around the pintle-wire Y, as shown in Fig. 1, and at *e*, *f*, and *g* in Fig. 3. A punch or punches H, or drills, if preferred, then form holes for the screws, and the strip, which has now become a long hinge, passes to the cutter I, which may be a reciprocating shear or a rotary cutter, as desired, and is timed to cut off the strip at the proper intervals to make hinges Z of the desired length. The cutting is preferably done at points corresponding with the ends of the knuckles, though this is not essential. It will be seen that a complete hinge can be produced at each movement of the dies and cutters, thus reducing the motion of the parts to a minimum.

While I prefer to use but a single strip of material, since this insures the regular and equable feeding of both leaves of the hinge by the feeding-rolls or other devices K, (which can be introduced wherever found to be necessary,) yet it is evident that two separate strips of material can be used, being fed into the machine either side by side, or one from below and the other from above, or in any suitable manner, being subjected to the action of dies effecting the forming of the knuckle portions, interlocking them, and so on, as in the case of a single strip, the double strip, however, being of less width than the single strip for the same size of hinge.

When reciprocating dies and cutters are used, the material will pass through the machine intermittingly, but if rotary dies and cutters are employed the movement of the material may be continuous.

The intermitting movement is thought to be the better on account of the greater simplicity of the machine. The character of the machine, however, has nothing to do with the present invention, which is confined to the method of manipulating the material to produce the hinges.

The machine may form the subject of a subsequent application.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The method of making hinges, which consists in jointing together the adjacent edges of suitable leaf portions and then severing the strip thus formed transversely of the line of the joint, substantially as described.

2. The method of making hinges, which consists in forming the knuckle portions along the edges of the leaf portions, interlocking said knuckle portions, placing the pintle-wire between the interlocked knuckle portions, bending the knuckle portions around the pintle-wire, and severing the resulting product transversely of the pintle-wire, substantially as described.

3. The method of making hinges, which consists in cutting the knuckle portions alternately along the edges of the leaf portions, turning them into an upright position, causing them to pass by each other and stand in a staggered line, feeding the pintle-wire into the trough-like structure thus formed, turning the knuckle portions around the pintle-wire, and severing the resulting product transversely of the pintle-wire, substantially as described.

4. The method of making hinges, which consists in cutting in two a single strip of material, forming knuckles along the adjacent edges of the two parts of the strips, joining the knuckles together, and severing the product transversely of the joint, substantially as described.

5. The method of making hinges, which consists in forming the knuckle portions along the interior of a strip of material, interlocking said portions, feeding the pintle-wire into place, and bending the knuckle portions around the wire, substantially as described.

6. The method of making hinges, which consists in punching out and bending up an alternating series of knuckle portions along the interior of a strip of material, narrowing said strip so as to cause the knuckle portions to pass by each other, feeding the pintle-wire in between the knuckle portions, and bending said portions around the wire, substantially as described.

7. The method of making hinges, which consists in punching out and bending up the knuckle portions along the median line of a

strip of material, narrowing the strip to cause the knuckle portions to stand in a staggered line on either side of the median line of the strip, feeding the pintle-wire into place, bending the knuckle portions around said wire, forming the screw-holes on each side of the joint, and severing the strip transversely of the pintle-wire, substantially as described.

8. As a step in the art of making hinges, punching out and bending up the knuckle portions from the interior of a single strip, substantially as described.

9. As a step in the art of making hinges, punching out the knuckle portions from the interior of a single strip of material and turning them into an upright position, with their interlocked edges in line, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

GEO. P. WHITTLESEY.

Witnesses:

GEO. SNYDER,

THOS. S. HOPKINS.