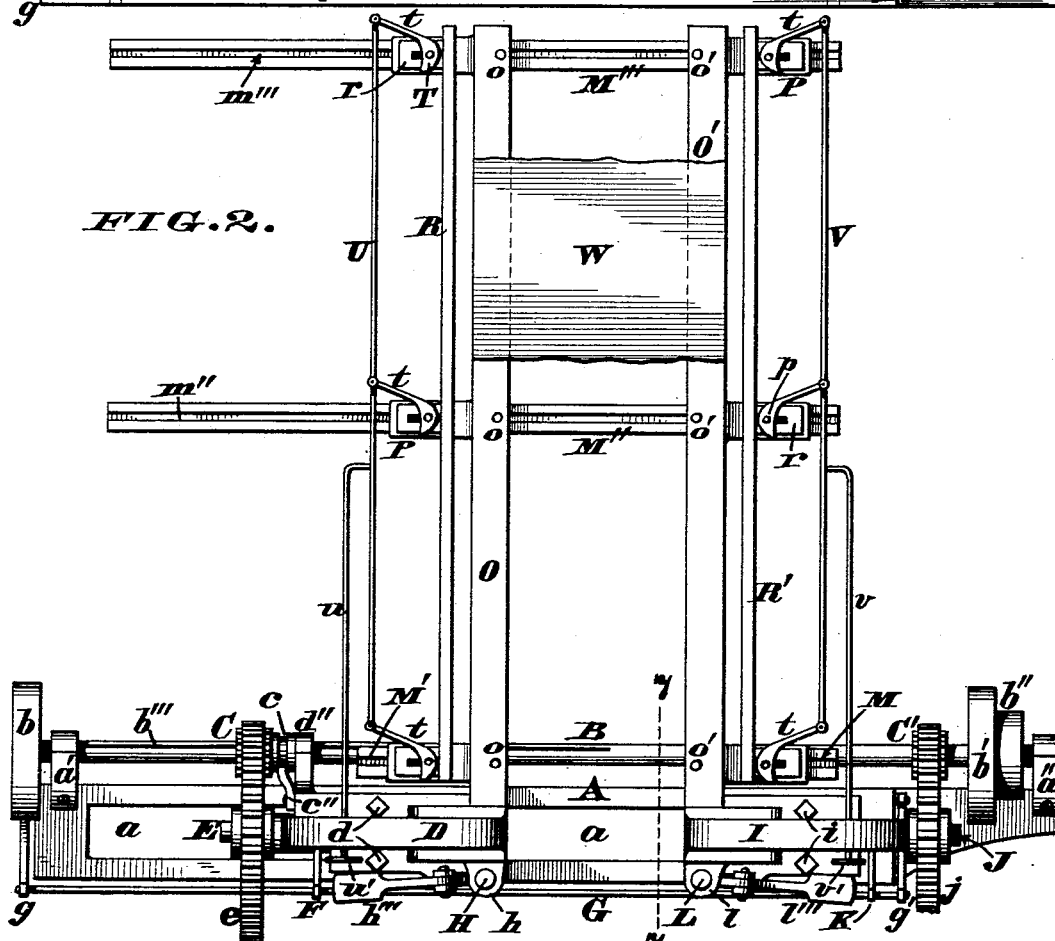
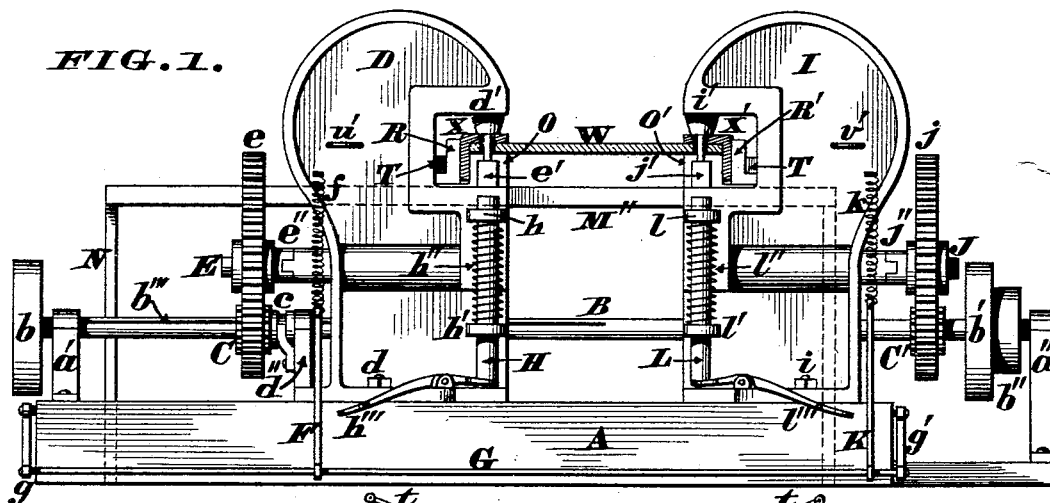


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COMBINED PUNCHING AND RIVETING MACHINE.

No. 523,393.

Patented July 24, 1894.



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FIG. 3.

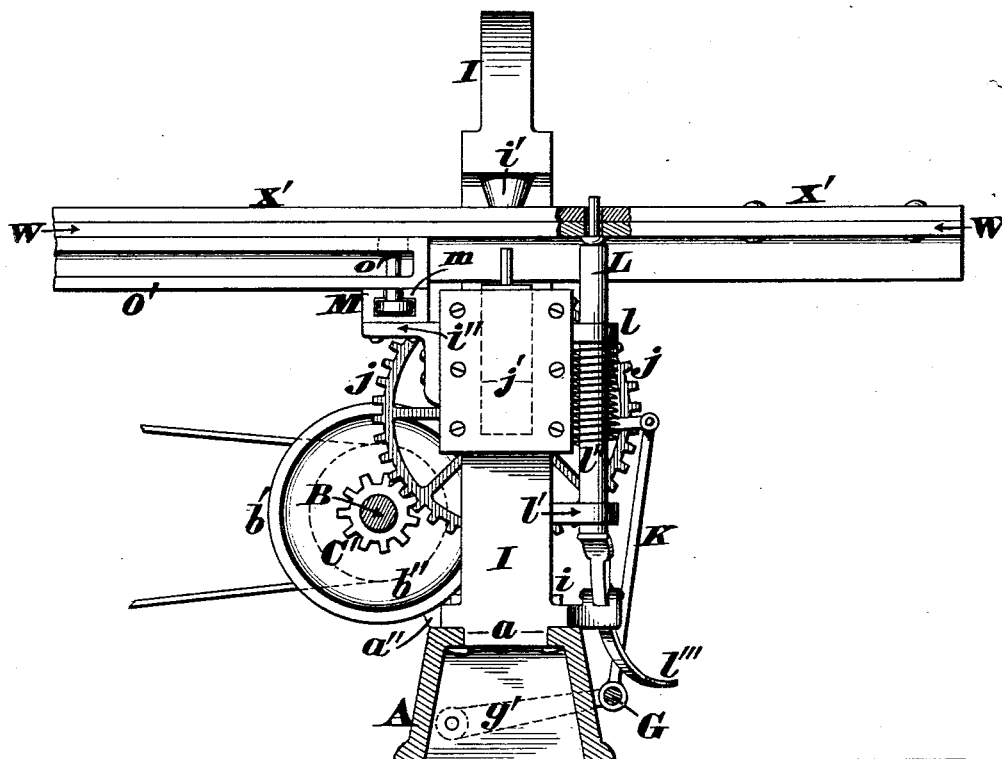


FIG. 4.

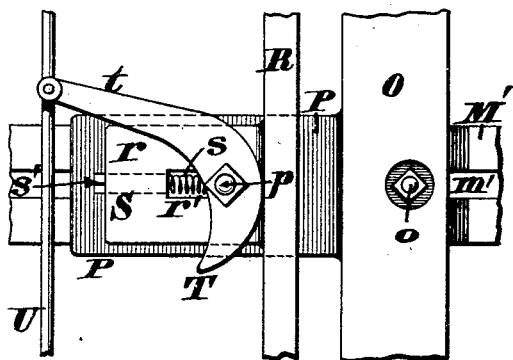


FIG. 5.

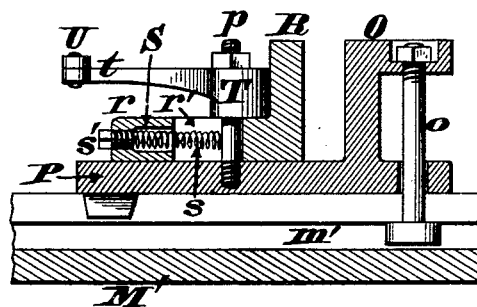
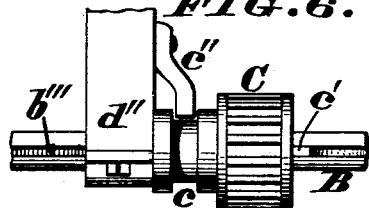


FIG. 6.



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# UNITED STATES PATENT OFFICE.

JACOB BAUM, OF AVONDALE, ASSIGNOR TO THE VICTOR SAFE AND LOCK COMPANY, OF CINCINNATI, OHIO.

## COMBINED PUNCHING AND RIVETING MACHINE.

SPECIFICATION forming part of Letters Patent No. 523,393, dated July 24, 1894.

Application filed March 5, 1894. Serial No. 502,361. (No model.)

*To all whom it may concern:*

Be it known that I, JACOB BAUM, a citizen of the United States, residing at Avondale, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in a Combined Punching and Riveting Machine; and I do hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the annexed drawings, which form part of this specification.

In Letters Patent No. 486,071, issued November 15, 1892, I have shown a machine for riveting angle-irons to sheet-metal plates, and in the present case some of the features of said machine are combined with duplex punches. By this construction the angle irons and plates are first punched and then riveted together without removing them from the machine, as hereinafter more fully described.

In the annexed drawings, Figure 1 is a front elevation of a machine embodying my improvements, the punches of the same being seen in the act of perforating a plate and a pair of angle irons. Fig. 2 is a plan of said machine. Fig. 3 is an enlarged vertical section of it, which section is taken at the line 7-7 of Fig. 2, and shows the fixed punch. Fig. 4 is an enlarged plan of an eccentric-clamp. Fig. 5 is a vertical section of the same. Fig. 6 is a plan of a pinion that gears with a spur wheel of the shiftable punch.

The base or bed-plate of the machine is a hollow casting A, having a longitudinal slot *a* in its upper side to admit the lower-ends of the punch frames, one of these connections being seen in Fig. 3. Projecting from this base are standards *a'*, *a''*, that serve as journal bearings for a driving shaft B armed with a pair of fly wheels *b*, *b'*, a pulley *b''* and a pair of pinions C, C', of which the latter one C', is securely fastened to said shaft, while the other pinion C, is coupled to it by a tongue and groove connection, to be presently described.

D is the main frame of a shiftable punch, which, after being adjusted to any suitable position upon the base A, is held in place by one or more bolts *d*, said frame being traversed by a shaft E, carrying a spur wheel *e* at one end and a punch slide *e'*, at its opposite

end; *d'* being the die penetrated by any sized punch attached to said slide. Spur wheel *e*, normally turns freely upon the shaft E, but can be coupled thereto at any time by a suitable clutch *e''*, operated by a connecting rod F, whose lower end engages with a bar G that runs along the base A, the ends of said bar being attached to said base by pivoted arms *g*, *g'*.

*f* is a spring that elevates the rod F and bar G. Furthermore, this main frame D carries a bracket *d''*, that bears against one end of a grooved-hub *c* of pinion C, the latter being provided with a key or feather *c'*, that enters a longitudinal groove *b'''*, of the shaft B.

*c''* is a lug, projecting from the bracket *d''*, and entering the groove of hub *c*, as seen in Fig. 6. By this arrangement the pinion C will, at all times, be kept in gear with the spur wheel *e*, and yet be driven by the shaft B, no matter how the punch frame D is shifted along the base A. Projecting from this frame are guides *h*, *h'*, for a vertically-acting anvil H, which is normally depressed by a coiled spring *h''*, but can be elevated by a treadle *h'''*, pivoted to the base of said frame D.

The punch frame D is duplicated at I, but the latter is unshiftablely bolted to the base A, at *i*, and is traversed by a shaft J, carrying a spur wheel *j* at one end, and a punch slide *j'*, at its opposite end; *i'* being the die penetrated by any sized punch attached to said slide. Spur wheel *j* normally turns freely upon the shaft J but can be coupled thereto at any time by a suitable clutch *j''*, operated by a connecting rod K whose lower end is engaged with the bar G, that serves as a common treadle for both of the clutches *e''* and *j''*. The construction of these clutches is immaterial, but usually they are the same as used with the common form of power press, and require no special description.

*k* is a spring that elevates the rod K and bar G. Furthermore, the spur wheel *j* is at all times in gear with the unshiftable pinion C', of driving shaft B. Projecting from frame I are guides *l*, *l'*, for a vertically-acting anvil L, which is normally depressed by a coiled spring *l''*, but can be elevated by a treadle *l'''*, pivoted to the base of said frame.

5 *i''*, in Fig. 3 is a bracket, secured to the rear side of frame I and serving to support a short guide M, whose upper surface has an undercut groove *m*, made longitudinally in it. M', in Fig. 2 is a similar guide, attached in the same manner, to the shiftable punch-frame D. M'' and M''' are other, but longer guides, held in proper positions by a leg at each end, one of said supports being seen at 10 N in Fig. 1, the upper surfaces of said guides being provided with undercut longitudinal-grooves *m'' m'''*. As many of these guides may be used as circumstances suggest, their duty being to support a pair of parallel bearers O, O', which are fastened to said guides by bolts *o, o'*, whose heads traverse the grooves *m m'' m'''*. Again, each bearer has a short lateral-extension P, more clearly seen in Figs. 4 and 5, which extensions support a pair of clamp bars R, R', running parallel with said bearers. Each clamp-bar has a lateral-extension *r*, slotted at *r'* to permit the passage of a bolt *p* projecting vertically from the extension P. Each extension *r* has 25 a horizontal chamber S to admit a coiled spring *s*, one end of which spring bears against the bolt *p*, while its other end is in contact with a screw *s'*, that closes the outer end of said chamber. The object of these springs is to force the clamp bars R, R', normally away from the bearers O, O', but said bars can be advanced toward said bearers by means of eccentrics T pivoted to the bolts *p*. Each eccentric has a lever *t*, and all the levers 35 on one side of the machine are coupled together by a common rod U, and the latter is operated by another rod *u*, that passes through the punch-frame D and has a pull or handle *u'*, convenient to the operator. The eccentric levers, on the opposite side of the machine, are jointed to a common rod V, having a pulling rod *v* and handle *v'*.

W, in Fig. 2 represents a sheet of metal resting upon the work-bearers O, O'.

45 My machine is arranged and operated in the following manner: The shiftable frame D is first adjusted along the base A until the distance between the outer edges of bearers O, O', is equal to the width of plate to be riveted to the angle irons, after which act, said frame is secured in place by the bolts *d*. The plate W is next laid upon the bearers, as seen in Figs. 1 and 2, and then the angle irons X, X', are applied, as represented in Fig. 1. This 55 illustration shows that the vertical webs of said irons occupy the channels between the bearers and clamp bars, while the horizontal webs of the irons rest upon the margins of the plate. The plate and irons are now drawn forward until the places for the desired perforations are directly over the punches carried by the slides *e', j'*, and then the handles *u', v'*, are pulled by the attendants, so as to turn the eccentrics T, advance the bars R, R', and thereby clamp the vertical webs of said 65 irons immovably against the bearers O, O',

thus preventing any accidental shifting of the three pieces to be punched. One of the attendants then depresses the treadle bar G, so as to cause the clutches *e'', j''*, to couple 70 the spur wheels *e, j*, to their respective shafts E, J, and during one turn of said shafts the punches are raised to penetrate the work and then lowered and withdrawn therefrom. The instant the three pieces are punched, the attendant removes his foot from the bar G, and 75 then the springs *f, k*, raises it, uncouple the clutches, and thereby stop the turning of shafts E, J. Handles *u' v'* are now forced back to unlock the eccentrics T, and enable the springs *s* to restore the clamp bars to their normal positions. After this act, the plate and irons are again drawn forward until the holes punched in them are directly over the anvils H, L, and then rivets with their heads down, are passed 85 up through said holes. Treadles *h''', l'''*, are next depressed, to raise the anvils and support the rivet heads, this elevated position of anvil L being seen in Fig. 3. A few blows with hammers on the protruding ends of the rivets suffice to head them up, and secure the 90 angle irons to the plate. The anvils are then allowed to drop down to their normal positions, the work is again drawn forward and securely clamped in place, the clutches re-engaged with the spur wheels, and another pair of holes is punched, as above described. 95

From this explanation it is evident that all the holes punched in the work are parallel with the sides of the plate, and as the bearers O, O', are perfectly square, with reference 100 to the punch-frames D, I, said holes are in line with each other when measured across said plate.

Finally, my invention is not limited to the precise form of punching apparatus, clutches and geared connections herein described, as the construction of these parts may be varied to suit circumstances. 105

I claim as my invention—

1. A combined metal-punching and riveting machine, consisting of a base A; stationary and shiftable punch-frames D, I, mounted thereon; a common shaft B, driving a pair of counter-shafts E, J, by means of gears C, *e, 110* *C', j*, and clutches *e'', j''*; punches *e', j'*, operated by said shafts E, J; reciprocating anvil-bars H, L, traversing guides of said frames, D, I; treadles *h''', l'''*, for operating these bars; bearers that support the work; rods F, K, for operating said clutches; and a single foot-bar G to which said rods F, K, are coupled; the arrangement of the various parts being such as to enable plates, bars, &c., to be perforated and then riveted together 125 without removing them from the machine, all as herein described and illustrated.

2. The combination, in a metal-working machine, of the guide M'', having an undercut longitudinal groove *m''*, the bearer O, 130 resting upon said guide, and having a lateral extension P, and a bolt *o*, which bolt engages

with said groove, the clamp-bar R having a  
slotted lateral-extension  $r$ ,  $r'$ , resting upon  
the extension P, a pivot  $p$ , projecting from  
the latter, and an eccentric T, applied to said  
5 pivot, for the purpose described.

3. In combination, with the bearer O and  
clamp bar R having the lateral extensions P,  
 $r$   $r'$ , and pivot T arranged as herein de-  
scribed, the chamber S in said extension  $r$ ,

and the spring  $s$  housed within said chamber, 10  
for the purpose described.

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

JACOB BAUM.

Witnesses:

JAMES H. LAYMAN,  
CHARLES B. CRANSTON.