No. 823,148. PATENTED JUNE 12, 1906.

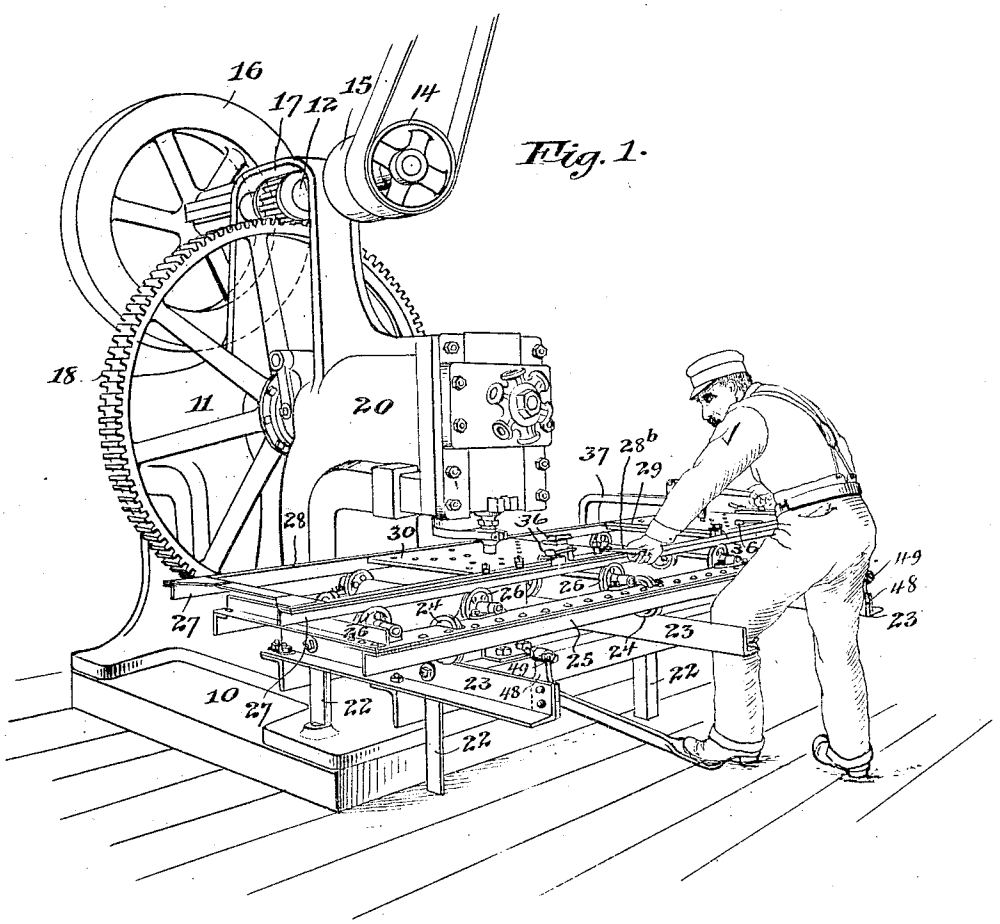
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PUNCHING MACHINE.

APPLICATION FILED OCT. 6, 1904.

4 SHEETS—SHEET 1.

Fig. 1.



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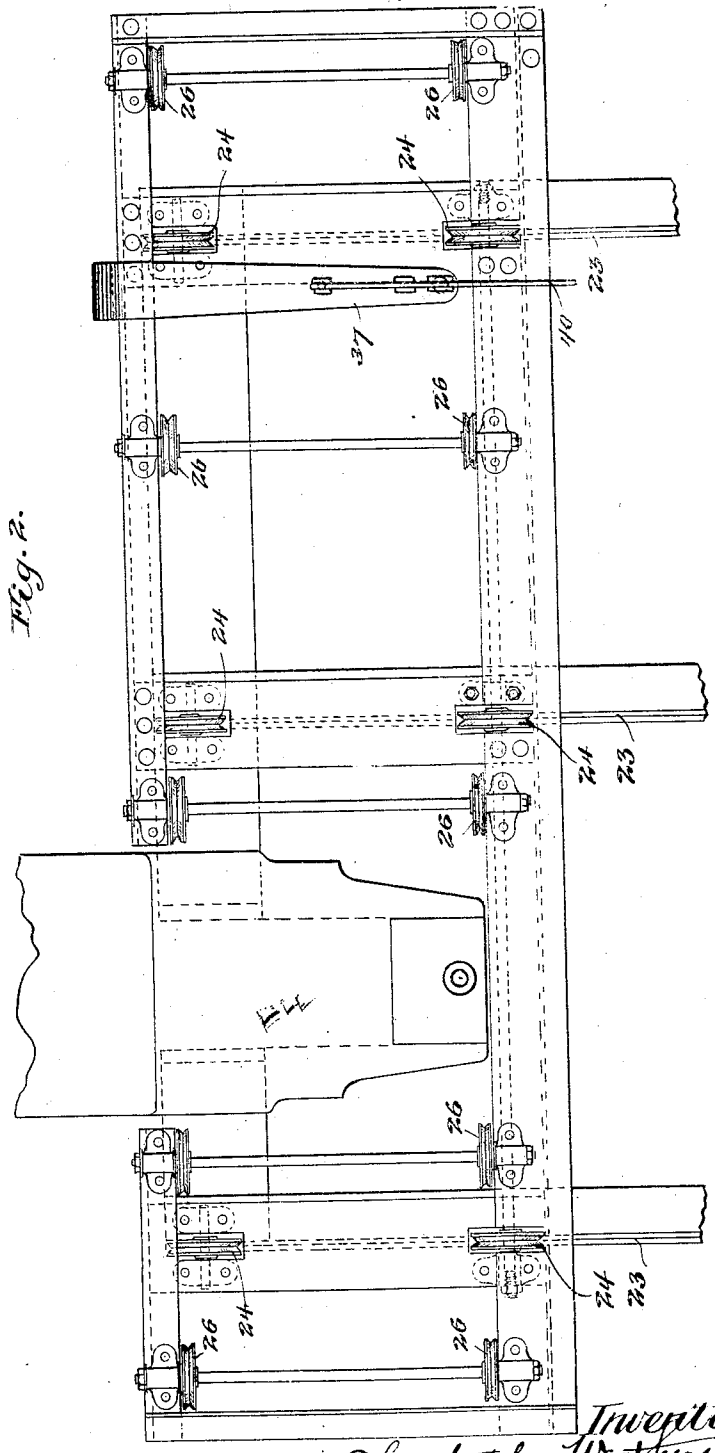


Fig. 2.

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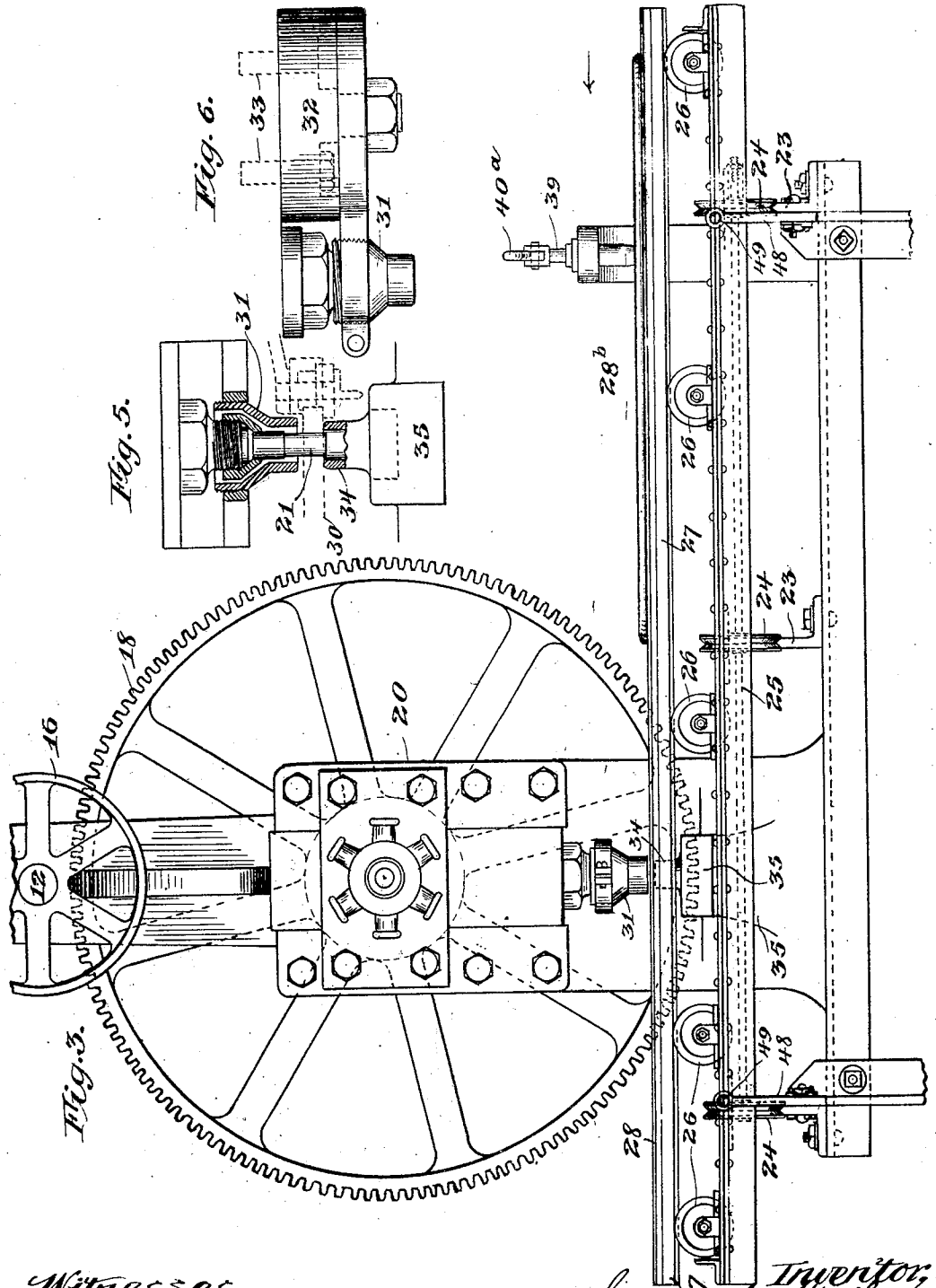
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4 SHEETS—SHEET 3.



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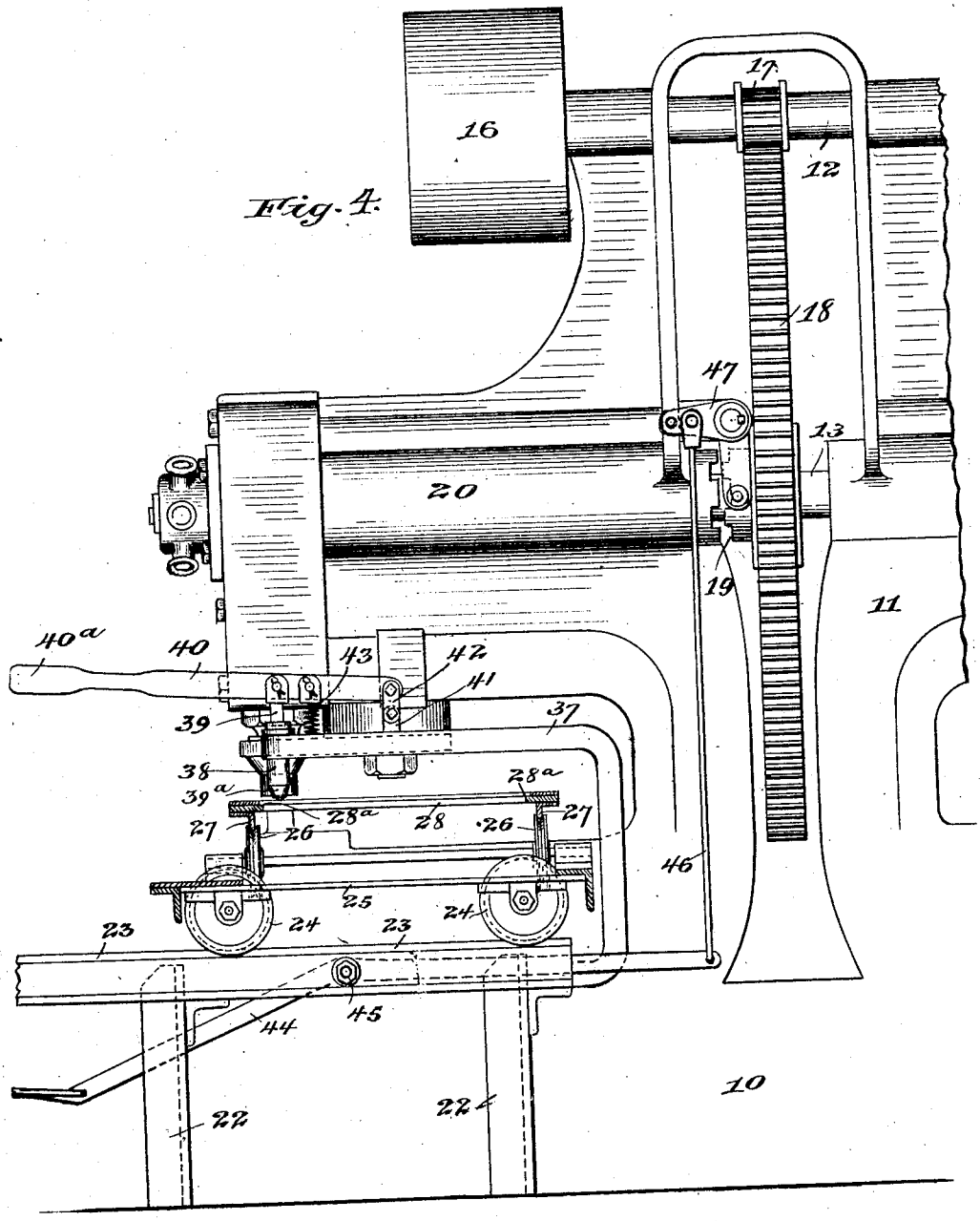
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4 SHEETS—SHEET 4.

Fig. 4.



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UNITED STATES PATENT OFFICE.

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PUNCHING-MACHINE.

No. 823,148. Specification of Letters Patent. Patented June 12, 1906.

Application filed October 6, 1904. Serial No. 227,398.

To all whom it may concern:

Be it known that I, CHRISTOPHER WEATHERSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Punching-Machines, of which the following is a specification.

My invention relates to punching-machines of that class which are employed in perforating metal plates for the reception of rivets, the creation of open-work designs, &c.; and the object of the invention is to produce an improved machine of this class in which the punching operations may be performed with greater ease, rapidity, and accuracy than heretofore.

Machines of this type at present in use employ for the most part a perforated wooden plate or templet, which is directly superposed upon and secured to the plate to be marked. The operator then with a hand-punch and hammer marks the underlying plate by applying the hand-punch successively to the several holes of the pattern-plate and striking a blow thereon. The pattern-plate is then removed and applied to other plates to be marked, which are treated in the same way. The plates thus marked are subsequently moved about beneath the power-punch of the machine, the point of the latter being lowered onto the centering marks previously formed by hand and the punch being then driven through the plate. The initial centering of the punch is thus dependent upon the visual accuracy of the operator in preliminarily centering the point of the punch upon the plate before the actual punching operation.

The machine of my present invention contemplates the employment of the templet in a different manner, so as to afford a positively-acting centering means, and, generally described, consists as to its essential features in the employment of a pair of horizontal supports, the lower of which is movable bodily in one direction, and the upper of which is movable bodily over the lower in a direction at right angles to the movement of the latter, with means for rigidly clamping both the templet and the plate to be punched on the upper support, and a centering device adapted to engage the holes in the templet in such a manner as to correspondingly center the plate to be punched beneath the punch of the machine.

A machine embodying the principle of my invention in the best mechanical form which I have as yet produced is illustrated in the accompanying drawings, wherein—

Figure 1 is a perspective view of the complete machine. Fig. 2 is a top plan view of the lower frame and supports of same. Fig. 3 is a front elevational view of the machine. Fig. 4 is an end elevational view of Fig. 3, viewed in the direction indicated by the arrow. Fig. 5 is a detail view, partly in vertical section, of the punch-point and guide therefor; and Fig. 6 is a side elevational view of the upper half of Fig. 5.

Referring to the drawings, 10 designates a bed-plate, and 11 a skeleton frame-piece which rises from the rear side of the bed-plate and carries suitable journals for a drive-shaft 12 and a punch-operating shaft 13. The drive-shaft 12 has fast and loose pulleys 14 and 15, respectively, a fly-wheel 16, and a pinion 17, meshing with a large gear 18, loosely mounted on the punch-shaft 13 and adapted to be made fast with the latter through a suitable clutch mechanism, (indicated at 19.) The punch-shaft 13 lies within a forwardly-projecting horizontal extension 20 of the upright frame overhanging the bed-plate and actuates in the forward end of the latter the usual mechanism, (not shown,) which imparts a reciprocating motion to the punch, the perforating end of which latter is shown at 21, Fig. 5.

Supported above the bed-plate 10 on suitable standards 22 are a series of parallel track-rails 23, extending forwardly and rearwardly of the bed-plate and constituting tracks for a series of grooved wheels or rollers 24, mounted in a rectangular frame 25, on the opposite sides of which latter are journaled another series of wheels or rollers 26, disposed in planes at right angles to the planes of the rollers 24. The rollers 26 constitute supports for a pair of track-rails 27, depending from the longitudinal side bars of an upper rectangular frame 28. This latter frame, as best shown in Fig. 4, is a plain open rectangular frame provided along the inner

edges of its longitudinal side bars with ledges or shoulders 28[a], adapted to form seats or supports for the front and rear edges of a perforated pattern-plate or templet 29 and the plate or other work to be punched, (indicated at 30.)

The punch-point 21 reciprocates through a suitable stationary guiding and centering device 31, Figs. 5 and 6, adjustably mounted in a carriage 32, adapted to be adjustably secured to the under face of the horizontal frame extension 20, as by the screw-bolts 33, while a socket-block 34, mounted in a bracket 35, projecting forwardly from the lower portion of the rear upright of the frame in vertical alinement with the path of movement of the punch-point, receives the latter and constitutes a local support for the plate 30 at the punching-point. The plate 30 is rigidly secured to its seat by means of suitable clamps (indicated at 36) engaging the margins thereof.

The templet 29 is supported and clamped in the frame 28 in a similar manner and by similar means to those already described in connection with the plate to be punched, being located in said frame to one side of the latter, as clearly indicated in Fig. 1. To the bed-plate or other stationary underlying portion of the machine-frame is rigidly secured an upwardly and forwardly bent arm 37, (best shown in Fig. 4,) the forward end of which overlies the templet 29 and is provided with a tubular guide 38, in which is reciprocally mounted a centering-pin 39, attached to a lever 40, this latter being pivotally mounted at its inner end through a post 41 and link 42 on the upper side of the arm 37 and terminating at its opposite end in an operating-handle 40[a]. A compression-spring 43, disposed between the upper side of the arm 37 and the under side of the lever 40 normally tends to maintain said lever and the centering-pin 39 in elevated position. The centering-pin 39 is of a diameter to just fit the holes in the templet and has a conical lower end 39[a], which on entering a hole automatically centers the plate to bring the axis of the hole coincident with the axis of the pin without requiring an exact centering of the pin and hole before dropping the former into the latter.

A foot-lever 44, pivoted at 45 to a stationary member of the underlying portion of the machine-frame, is connected by a thrust-rod 46 with one arm of a clutch-operating forked bell-crank lever 47, whereby the depression of the pedal-lever operates to connect the coöperating members of the clutch and impart movement to the punch.

On the forward ends of the track-rails 23 are secured posts 48, which carry in their upper ends horizontally-disposed set-screws 49, that are adjustable to serve as stops, limiting the outward travel of the lower frame 25 through contact with the adjacent edge of said frame, and thus avoiding accidental displacement of the movable frames relatively to the bed.

In the operation of the machine the templet 29 and the plate 30 to be operated upon are rigidly secured in the frame 28 by the clamps 36, the former beneath the centering-pin 39 and the latter beneath the punch-point 21. The operator, grasping with one hand the frame 28 or a suitable grip-handle 28[b] on the latter, as shown in Fig. 1, moves the frames 25 and 28 longitudinally and transversely of the bed-plate until one of the holes of the templet lies beneath or substantially in vertical alinement with the centering-pin 39, whereupon he depresses the handle 40[a] with the other hand, thus causing said centering-pin to engage the templet and lock the upper and lower movable frames 28 and 25 against further movement in any direction. This determines the position of the corresponding hole in the plate 30, so that it only remains to depress the pedal-lever 44 and throw into action the punch-operating mechanism, which causes the punch to descend and perforate the plate at the desired point. The lever 40 is then raised, the frames adjusted to bring the centering-pin 39 into registration with another hole of the templet, and the described operations are repeated successively, with the result that the plate 30 is finally perforated in exact duplicate with the templet 29, whereupon the plate is readily removed by moving the upper frame 28 longitudinally out from beneath the punch. Another plate is inserted and operated upon in like manner.

The two frames, movable in directions at right angles to each other and mounted the upper upon the lower, permit a universal movement of the upper frame and of the templet and work carried thereby, and both frames being mounted on practically anti-friction-rollers they are easily and quickly adjustable, so that the centering of the work through the templet and its centering-pin can be very easily and rapidly performed.

It is evident that modifications in respect to the detail construction and relative arrangement of parts in the above-described machine might be made without departing from the principle or sacrificing any of the advantages thereof, and hence the invention is not to be understood as limited to the particular form and construction of mechanism herein illustrated and described, except to the extent clearly indicated in specific claims.

I claim—

1. In a punching-machine, the combination with a punch and means for actuating the same, of a support for the plate to be punched universally movable in a single plane, a templet carried by said support and located to one side of said plate, and centering means coöperating with said templet to

effect the positioning of said support and the plate relatively to the punch, substantially as described.

2. In a punching-machine, the combination with a punch and means for actuating the same, of a support for the plate to be punched universally movable in a plane parallel with the plane of the latter, a templet carried by said support and rigid relatively to said plate and located to one side of the latter, and a reciprocable centering device for the plate coöperating with said templet, said centering device and templet being provided the one with a pin and the other with a hole adapted to be entered by said pin in the centering operation, substantially as described.

3. In a punching-machine, the combination with a punch and means for actuating the same, of a support for the plate to be punched universally movable in a plane parallel with the plane of the latter, a perforated templet also carried by said support and located to one side of said plate, and a reciprocable centering-pin coöperating with the perforations of said templet to effect the positioning of said support and the plate relatively to the punch, substantially as described.

4. In a punching-machine, the combination with a punch and means for actuating the same, of a pair of frames mounted one upon the other and movable relatively and in directions at right angles to each other, means for rigidly supporting the plate to be punched upon the upper of said frames, a templet and means for rigidly supporting the same also upon the upper of said frames, and centering means coöperating with said templet to effect the positioning of said frames and the plate relatively to the punch, substantially as described.

5. In a punching-machine, the combination with a punch and means for actuating the same, of a pair of frames mounted one upon the other and movable relatively and in directions at right angles to each other, means for rigidly supporting the plate to be punched upon the upper of said frames, a perforated templet and means for rigidly supporting the same upon the upper of said frames to one side of said plate, and a reciprocable centering-pin coöperating with the perforations of said templet to effect the positioning of said frames and the plate relatively to the punch, substantially as described.

6. In a punching-machine, the combination with the machine-frame, a punch reciprocably mounted therein, and means for actuating said punch, of a horizontally-disposed lower frame supported by roller and track connections above the bed-plate of the machine-frame and movable in one direction over the latter, an upper horizontally-disposed frame supported upon said lower frame by roller and track connections and movable over said lower frame in a direction at right angles to the direction of movement of said lower frame, means for rigidly supporting the plate to be punched upon said upper frame, a perforated templet and means for rigidly supporting the same upon said upper frame to one side of said plate, and a reciprocable centering-pin coöperating with the perforations of said templet to effect the positioning of said frames and the plate relatively to the punch, substantially as described.

7. In a punching-machine, the combination with the machine-frame, a punch reciprocably mounted therein, and means for actuating said punch, of a track disposed above the bed-plate of the machine-frame, a horizontally-disposed lower frame having rollers reciprocable over said track and having other rollers mounted thereon in planes at right angles to said first-named rollers, an upper horizontally-disposed frame having a track resting upon said other rollers, means for rigidly supporting the plate to be punched upon said upper frame, a perforated templet and means for rigidly supporting the same upon said upper frame to one side of said plate, and a reciprocable centering-pin coöperating with the perforations of said templet to effect the positioning of said frames and the plate relatively to the punch, substantially as described.

8. In a punching-machine, the combination with a punch and means for actuating the same, of a stationary bed-frame, a pair of frames mounted one upon the other upon said bed-frame and movable relatively and in directions at right angles to each other, means for rigidly supporting the plate to be punched upon the upper of said frames, a templet and means for rigidly supporting the same also upon the upper of said frames, centering means coöperating with said templet to effect the positioning of said frames and the plate relatively to the punch, and stop devices secured on said bed-frame and limiting the outward movement of the lower movable frame, substantially as described.

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