

G. P. THOMAS.
PUNCHING MACHINE.
APPLICATION FILED OCT. 11, 1907.

908,817.

Patented Jan. 5, 1909.

2 SHEETS—SHEET 1.

FIG. 1.

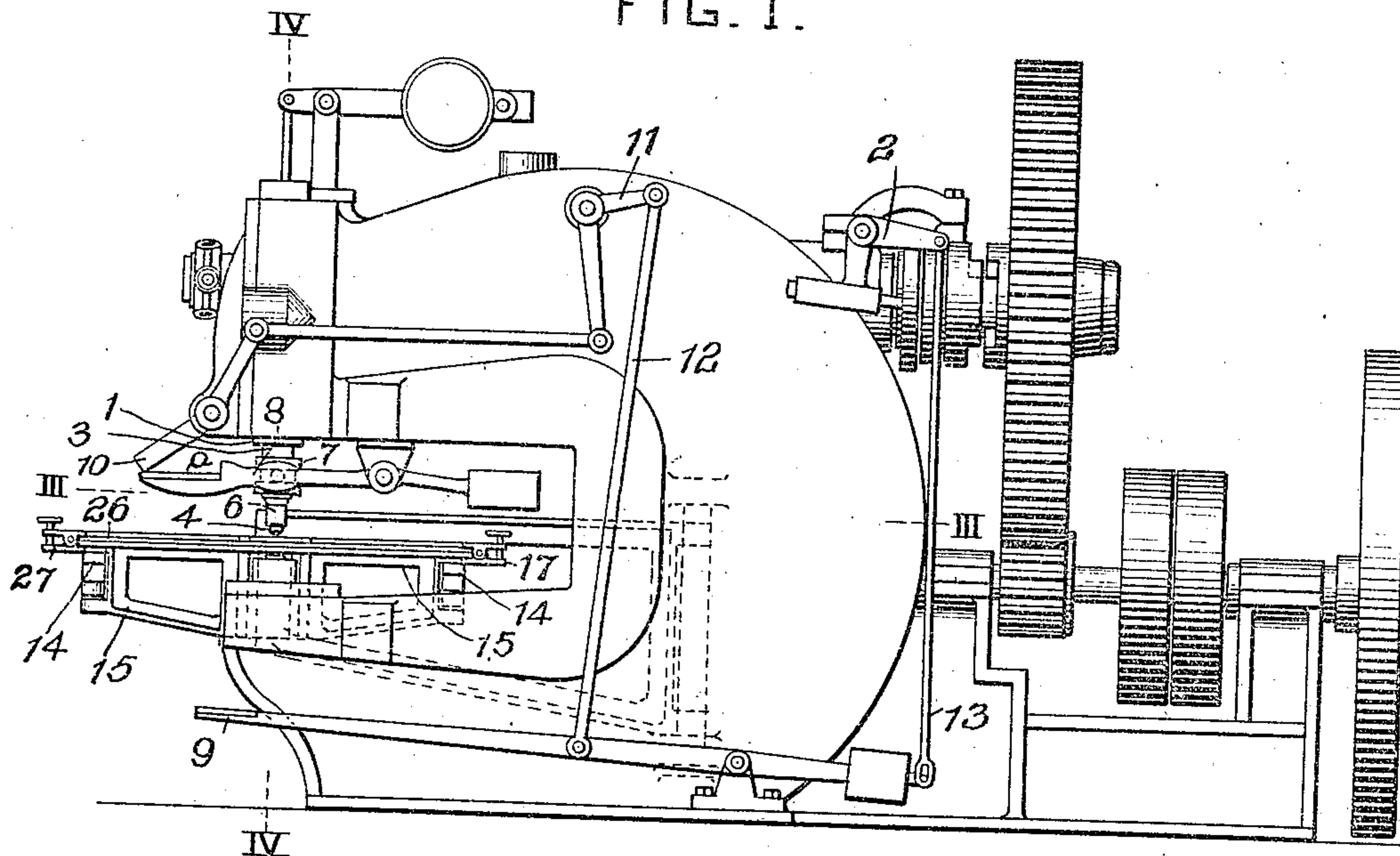
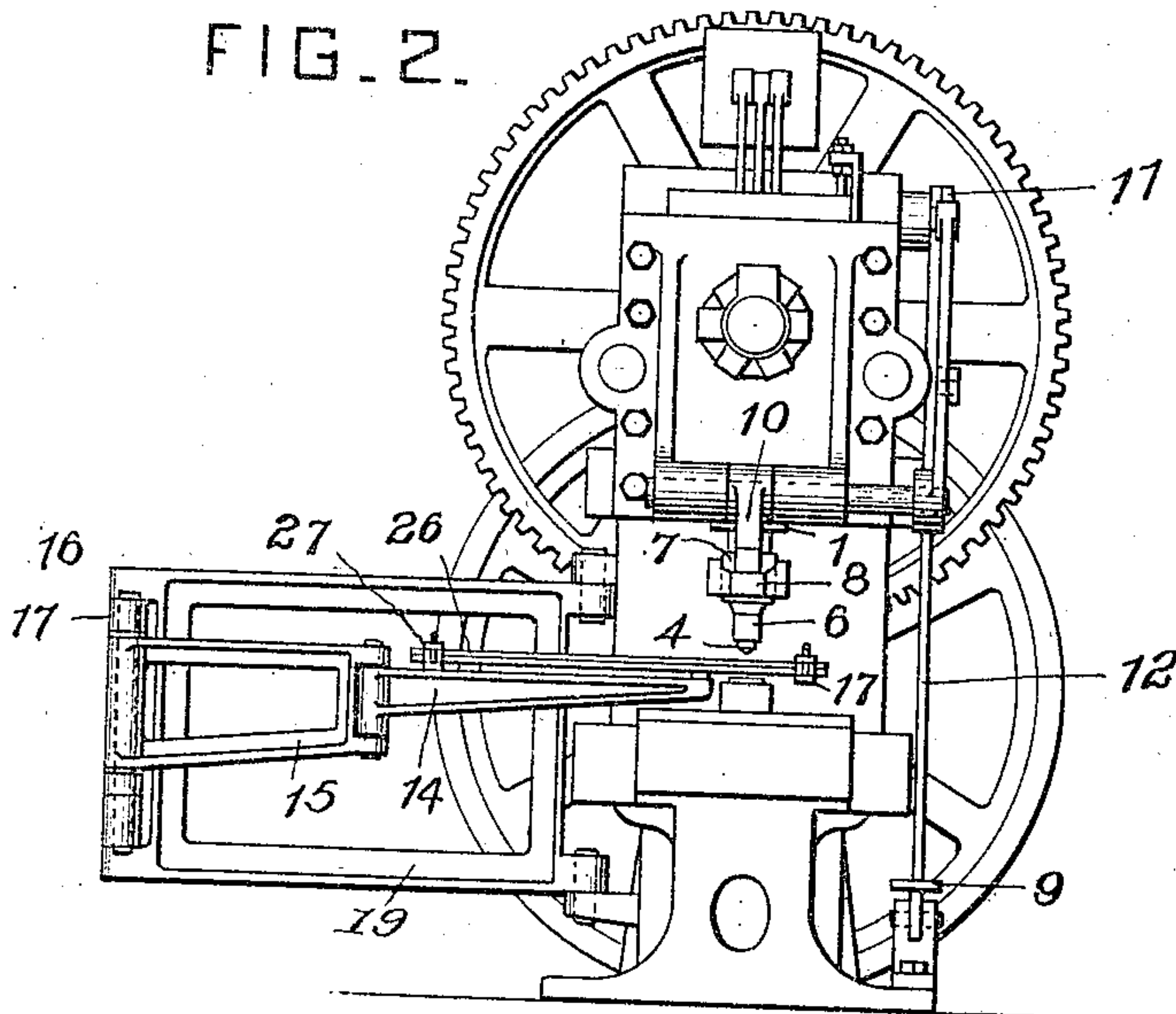


FIG. 2.



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GEORGE P. THOMAS, OF PITTSBURG, PENNSYLVANIA.

PUNCHING-MACHINE.

No. 908,817.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GEORGE P. THOMAS, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, a citizen of the United States, have invented or discovered certain new and useful Improvements in Punching-Machines, of which improvements the following is a specification.

In punching plates, etc., where the positions of the holes cannot be determined by suitably arranged stops, great difficulty is encountered in placing the plate or other article accurately in position under the punch, although the points where the holes are to be formed has been previously marked or indicated on the plates.

The object of the present invention is to provide for the accurate positioning of the plate under the punch, prior to the operation of the latter.

The invention is hereinafter more fully described and claimed.

In the accompanying drawings forming a part of this specification, Figure 1 is a side elevation of a punch having my improvement applied thereto; Fig. 2 is a front elevation of the machine; Fig. 3 is a sectional plan, the plane of section being indicated by the line III—III Fig. 1; Fig. 4 is a sectional elevation on a plane indicated by the line IV—IV Fig. 1; and Fig. 5 is a detail view illustrating a modification of the sleeve-shifting means.

In the practice of my invention the punch operating mechanism may be of any suitable construction, but is preferably of the type, in which the movement of the punching head 1 is controlled by the operator through a suitable form or construction of clutch mechanism as indicated at 2. The head 1 is provided with a stem 3, to which the punch 4 is secured as by the annular nut 5 screwing into a recess in the end of the stem. A guide is provided to insure the proper position of the plate, such guide being arranged in such relation to the punch that when the plate has been moved to a position where the guide will be in line with or bear upon a certain pre-determined point on the plate to be punched, the point at which the hole is to be formed will be accurately in line with the punch. In my preferred construction this guide is made in the form of a nipple 6 constructed to move freely over the punch 4 and secured to a sleeve 7 movably mounted on the stem 3.

In using this guide it is shifted so as to project down onto the plate to be punched, and when the plate has been moved so that the nipple will accurately indicate the point to be punched, the punch is operated. The sleeve and nipple can be operated by the hand or the foot of the operator, but preferably by the foot. To that end the sleeve 7 is connected to one end of a lever 8 which can be shifted by a treadle 9. A desirable construction to this end consists of an arm 10 pivotally connected to the punch in such position that when moved to vertical position it will force the outer end of the lever and the sleeve. This arm 10 is connected to one arm of a bell crank lever 11 the opposite arm being connected to the treadle by a rod 12. An efficient means for shifting the lever 8 and the sleeve is shown in Fig. 5 and consists of a wedge block 10^a mounted on a suitable support on the frame of the punch, and connected to the bell-crank 11.

It is preferred that arm 10 and lever 8 should be so constructed that the arm can be swung until its point of bearing on the lever and its pivotal points should be in the same plane, thereby locking the lever down in a position to act as a stripper for the punch. The same function can be obtained in the construction shown in Fig. 5 the lever and wedge block being provided with straight portions, which come into alinement on movement of the block and lock the lever and sleeve in stripping position.

It is preferred that the same treadle should be used to move the sleeve and nipple and also shift the clutch so as to connect the power shaft with the punch-head 1. To this end the treadle is connected to a rod 13 operating the movable member of the clutch 2, in such manner that the rod will not be moved by the treadle until the block or arm 10 has shifted to cause the lever to move the nipple down onto the plate. Whereupon the further movement of the treadle will shift the clutch but will not move the lever 8, as the straight portions *a* of the lever and block bear at that time on each other.

While the plates can be supported during the punching operation by any suitable means, it is preferred to employ a work support such as shown in Figs. 2 and 3. The plate is supported by fingers 14, which are so mounted as to be capable of being moved towards and from each other, thus providing

a stable support for plates varying largely in dimensions. The fingers are supported by a jointed frame connected to a standard such as the frame of the punch. This frame consists preferably of a bracket 19 pivoted to the frame of the punch. An arm hinged to the free end of the bracket and preferably consisting of sections 17 and 18 hinged together, and a plurality of arms 15 having a pivotal connection to the outer section 17, such connection being the pin 16. The fingers 14 are hinged as stated to the arm 15 forming the outer member of the jointed frame. This construction of work support, which is also adapted for use in other metal operations than punching, permits of a wide or restricted spread of the fingers and a movement of the fingers and articles carried thereby, horizontally in any direction.

In punching plates a templet 26 is prepared having holes arranged as desired in the finished plate and of a size to permit of the entrance of the end of the nipple 6. This templet is secured on the plate by suitable clamps 27 and the plate placed on the supporting fingers 14. The operator presses down on the treadle at the same time shifting the plate, until the nipple will pass into or through a hole in the templet. As soon as the nipple has entered the hole in the templet the treadle is further depressed thereby shifting the movable member of the clutch and causing the operation of the punch.

It will be observed that unless the nipple enters a hole in the templet the treadle cannot be moved sufficiently far to shift the clutch, thus rendering it necessary to bring the plate in proper position before a hole can be punched.

I claim herein as my invention:

1. A punching machine, having in combination a movable punch, means for operating the punch, a punch guide having predetermined position relative to the punch, and means for moving the punch guide towards the article to be punched in advance of the punch and for holding the guide in contact with such article after the retraction of the punch.

2. A punching machine, having in combination a movable punch, means for operating the punch, a punch guide and means for moving the guide towards the article operated on and controlling the operation of the punch.

3. A punching machine, having in combination a movable punch, means for operating the punch, a nipple surrounding the punch and means for moving the nipple independent of the punch and holding it in advanced position during the retraction of the punch.

4. A punching machine having in combi-

nation a movable punch, a nipple surrounding the punch, means for moving the nipple independent of the punch and means for locking the nipple when shifted.

5. A punching machine having in combination a punch, means for operating the punch, a nipple surrounding the punch and means for moving the nipple independent of the punch and controlling the punch operating means.

6. A punching machine having in combination a punch, means for operating the punch, a punch guide, means for moving the guide independent of the punch and controlling the operation of the punch operating means, and means for preventing the punch controlling movement prior to the full operative movement of the guide.

7. A punching machine having in combination a punch, means for operating the punch, a nipple surrounding the punch, a lever connected to the nipple, a wedge block for shifting the lever, a treadle for shifting the wedge-block, connections extending from the treadle and controlling the punch operating means, the connections being adapted to be shifted subsequent to the movement of the nipple.

8. A punching machine having in combination a templet having holes arranged in the relation desired in the finished plate and adapted to be secured to the latter, a punch, means for operating the punch, a nipple surrounding the punch and means for causing the nipple to enter the holes in the templet in advance of the punch and holding it in such position during the retraction of the punch.

9. A metal working machine having in combination therewith a pivotally mounted and jointed frame and a plurality of work supporting fingers pivotally connected to said frame.

10. A metal working machine having in combination therewith a swinging bracket, arms pivotally connected to each other and to the bracket and a plurality of work supporting fingers connected to the outer arm and movable relative to each other.

11. A metal working machine having in combination therewith a swinging bracket, an arm pivotally connected to the bracket, a plurality of arms pivotally connected to the free end of the first arm and work-supporting fingers pivotally connected to the free ends of the second arms.

In testimony whereof, I have hereunto set my hand.

GEORGE P. THOMAS.

Witnesses:

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CHARLES BARNETT.