M. J. RIGGS.

PUNCHING MACHINE.

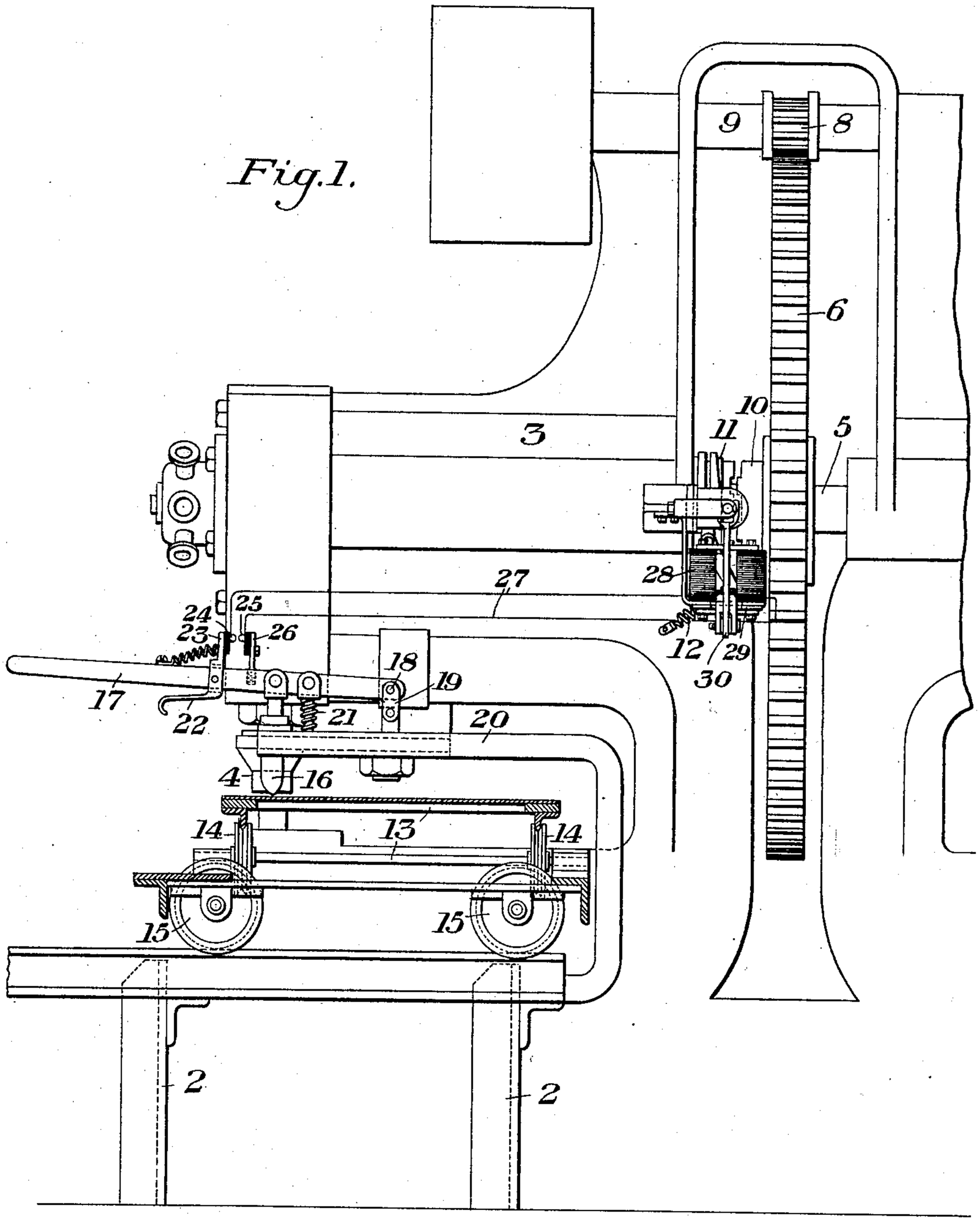
APPLICATION FILED FEB. 10, 1908.

899,324.

Patented Sept. 22, 1908.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 2.

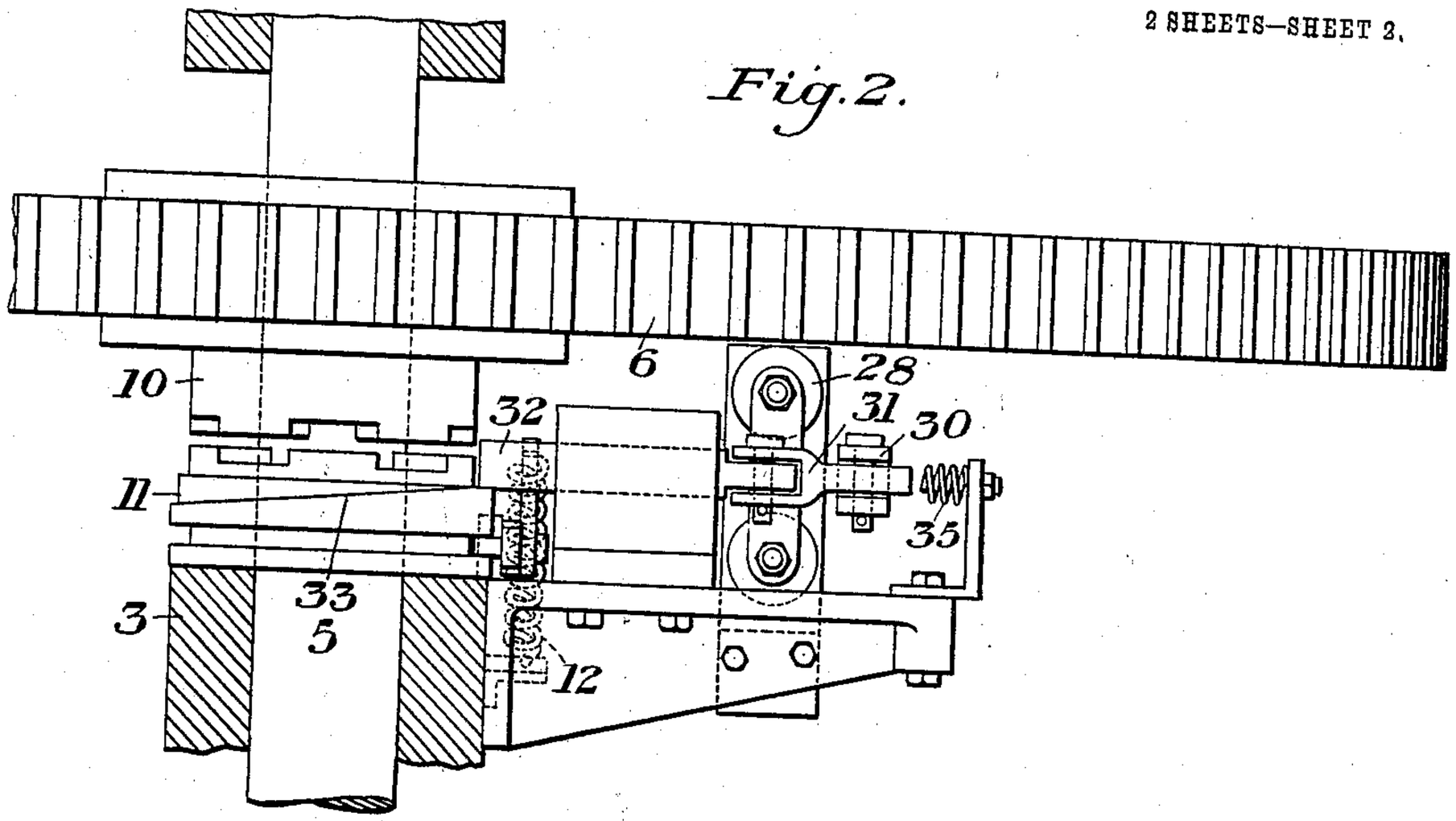
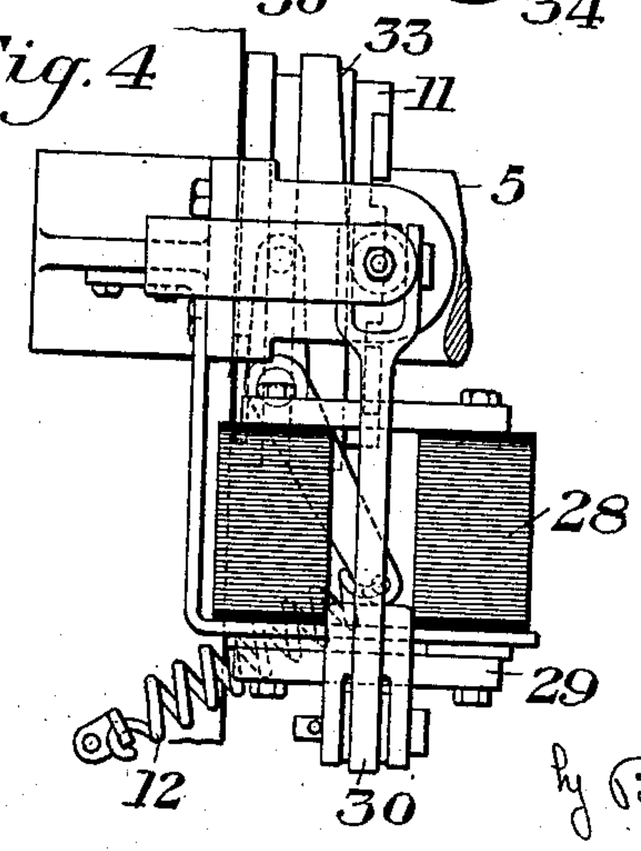


Fig. 3.

Fig. 4



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UNITED STATES PATENT OFFICE.

MORRIS J. RIGGS, OF TOLEDO, OHIO, ASSIGNOR TO AMERICAN BRIDGE COMPANY, OF PITTSBURG, PENNSYLVANIA, A CORPORATION OF NEW JERSEY.

PUNCHING-MACHINE.

No. 899,324. Specification of Letters Patent. Patented Sept. 22, 1908.

Application filed February 10, 1908. Serial No. 415,023.

To all whom it may concern:

Be it known that I, MORRIS J. RIGGS, of Toledo, Lucas county, Ohio, have invented a new and useful Punching-Machine, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an end elevation, partly in section, of a punching machine embodying my invention; and Figs. 2, 3 and 4 are detail views showing the clutch-actuating mechanism.

My invention has relation to punching machines of the general class described and claimed in the patent to Weatherson, No. 823,148, dated June 12th, 1906. In machines of this class, a support is provided for the plate to be punched, said support being universally movable in a single plane. There is also provided a templet or pattern plate located at one side or at one end of the plate to be punched, together with centering means consisting preferably of a pin carried by a lever and adapted to enter perforations in the pattern plate or templet, the arrangement being such that when the pin is entered in any particular perforation of the templet, and the punch is operated, a hole is punched in the plate in the correct position.

The present invention is designed to provide improved means in connection with the operating lever of the centering pin, for controlling the operation of the punch.

The precise nature of my invention will be best understood by reference to the accompanying drawings, in which I have shown one embodiment thereof, and which will now be described, it being premised, however, that various changes may be made in the details of construction and arrangement by those skilled in the art without departing from the spirit and scope of my invention as defined in the appended claims.

In these drawings, the numeral 2 designates the frame of the punching machine having an overhanging arm 3 in which the punch 4 and its operating mechanism are supported in the usual manner.

5 designates the punch operating shaft, which is shown as driven by gear wheel 6 engaging a driving pinion 8 on a driving shaft 9. The gear wheel 6 is loosely mounted on the shaft 5 and has a clutch hub 10 which is adapted to engage a sliding clutch member 11 fixedly connected to the shaft to rotate therewith under the action of a spring 12.

13 designates the universally movable table or support for the plate to be punched, and which may be mounted upon the two sets of track wheels 14 and 15 in the manner shown and described in the Weatherson patent or in any other suitable manner.

16 designates the centering pin, which is adapted to enter the perforations in the pattern plate or templet. This pin is loosely connected at its upper end to a hand lever 17, which is fulcrumed at 18 in a link 19 carried by a supporting arm or bracket 20 fastened to the frame member which supports the moving table 13.

21 is a spring which is interposed between the lever and the bracket or support 20, for the purpose of normally holding the lever in its elevated position with the pin 16 withdrawn from the pattern plate or templet.

Pivoted on the lever 17 is a small finger lever 22 having an upwardly extending arm 23 carrying an insulated electric contact 24, which, when the finger arm of the lever is pressed upwardly toward the main lever 17, is adapted to be engaged with a coacting contact 25 carried by an arm 26 supported by the lever 17. The engagement of these contacts 24 and 25 closes an electric circuit 27, which includes the coils of the electro-magnets 28.

29 is an armature, which is carried by the short arm of a bell crank lever 30, whose longer and upwardly extending arm is connected by link 31 with a pin or plunger 32 whose free end engages a cam surface 33 on the clutch member 11 before referred to.

34 is an adjustable counterweight for the lever 30, and 35 is a spring which is arranged to be compressed by the movement of the lever 30 when the armature 29 is attracted by the magnets.

The operation is as follows:—The operator depresses the lever 17 to enter the pin 16 in one of the holes or perforations in the templet, and when the pin is so entered, presses the lever 22 and thereby closes the electric circuit 27 which energizes the magnets 28. The energized magnets attract the armature 29, thereby actuating the lever 30 and withdrawing the pin or plunger 32 from its engagement with the cam surface 33 of the clutch member 11. This engagement of the pin or plunger has been holding the clutch members

10 and 11 out of contact with each other, as clearly shown in Fig. 2. As soon as the pin or plunger 32 has withdrawn, the spring 12 throws the clutches into engagement, and the punching tool is actuated. When the lever 22 is released by the operator the pin or plunger 32 is thrown into engagement with the cam surface 33 by the action of the counterweight 34 and by the impulse of the spring 35, the latter being for the purpose of giving a quick initial impulse. The rotation of the cam surface 33 of the clutch member 11 against the end of the pin or plunger 32 retracts the clutch member 11 from engagement with the clutch hub 10 and the tool is rendered inoperative.

The device described forms an extremely simple and effective means for enabling the operator to control the action of the punch, since he has only to exert a slight pressure on the finger lever 22 after the centering pin 16 has been engaged with a perforation of the templet to start the punch; and the punch will be stopped as soon as he releases his pressure on this lever.

I do not wish to limit myself to the control of the punching tool by a clutch such as described, it being obvious that the magnets may control any form of starting and stopping device for the tool. It is also obvious that the magnets and connections operated thereby for controlling the clutch can be changed in their mechanical construction and arrangement without departing from my invention.

I claim:—

1. In a machine of the character described, the combination of a movable templet and work support, an index pin arranged to cooperate with the templet, a tool arranged to act on the work, a device for throwing the tool into and out of operation, lever means for actuating the index pin, and a supplemental lever device mounted on said lever for controlling the operation of the tool-controlling device; substantially as described.

2. In a machine of the character described, the combination of a movable templet and work support, an index pin arranged to cooperate with the templet, a lever for actuating said pin, a tool arranged to act on the work, a device for throwing the tool into and out of operation, a magnet for controlling said device, and means carried by the index operating lever for controlling the circuit of the magnet; substantially as described.

3. In a machine of the character described, the combination of a movable templet and work support, a lever, an index pin carried by said lever and arranged to coöperate with the templet, a tool for acting on the work, a device for effecting the starting and stopping of the tool, a magnet for controlling said device, contacts carried by the said lever for controlling the circuit of the magnet, and means for opening and closing said contacts; substantially as described.

4. In a machine of the character described, the combination of a movable templet and work support, an index pin arranged to cooperate with the templet, a tool for acting on the work, a device for controlling the operation of the tool, a magnet for controlling the operation of said device, and contact means carried by said lever for controlling the circuit of the magnet, a counterweighted armature lever actuated by the magnet for controlling the action of the tool-controlling device, and a spring arranged to act upon the said lever in opposition to the magnet; substantially as described.

5. In a machine of the character described, a tool actuating mechanism, including clutch members, one of said members being fixed to the tool-actuating shaft with respect to rotary movement, but having a sliding movement on said shaft, a spring for throwing said clutch in one direction, a pin or plunger normally held in engagement with a cam surface on the movable clutch member, an electro-magnet for retracting said pin from engagement with the cam surface, and a spring arranged to be compressed by retraction of the pin; substantially as described.

In testimony whereof, I have hereunto set my hand.

MORRIS J. RIGGS.

Witnesses:
ERNEST E. THAYER,
S. G. BROWN.