

No. 688,479.

Patented Dec. 10, 1901.

F. NATHER.

ADJUSTABLE GAGE ATTACHMENT FOR METAL PERFORATING MACHINES.

(Application filed Mar. 18, 1901.)

(No Model.)

3 Sheets—Sheet 1.

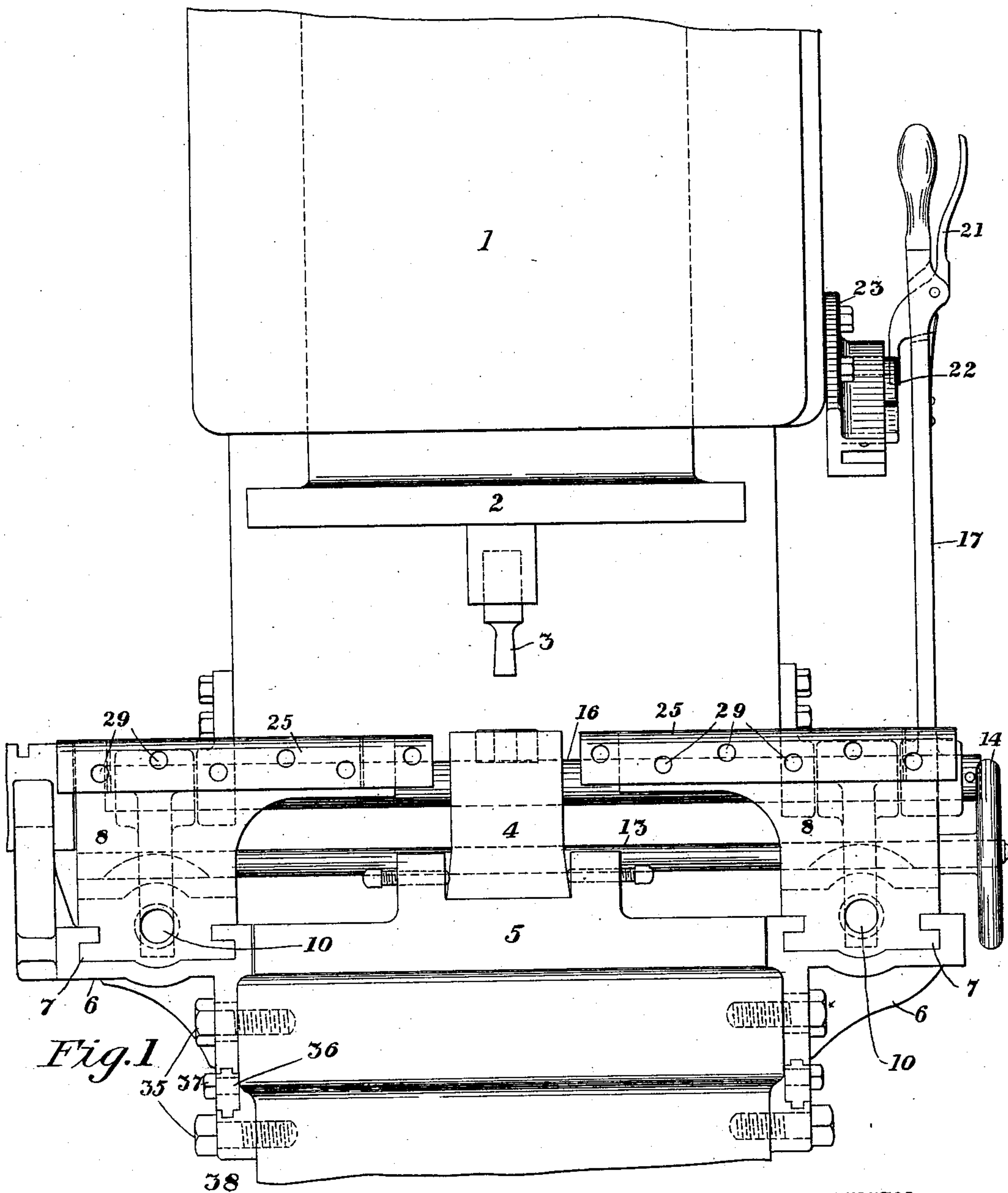


Fig. 1

WITNESSES:

*Wm. G. Bal.*  
*Annie M. Mason.*



Fig. 8

INVENTOR

*Frank Nather,*  
BY  
*Geo. H. Parmelee,*  
his ATTORNEY.

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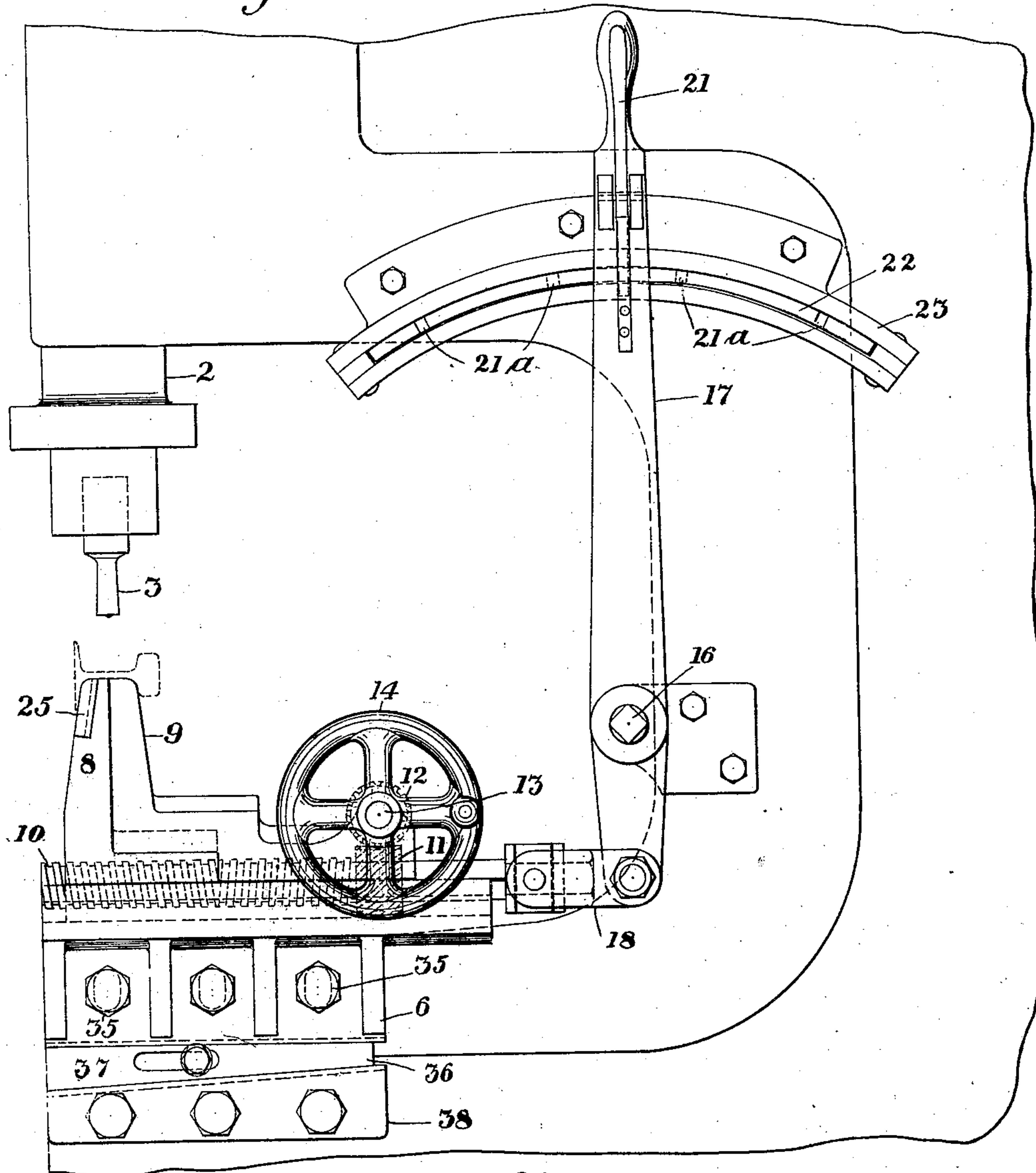
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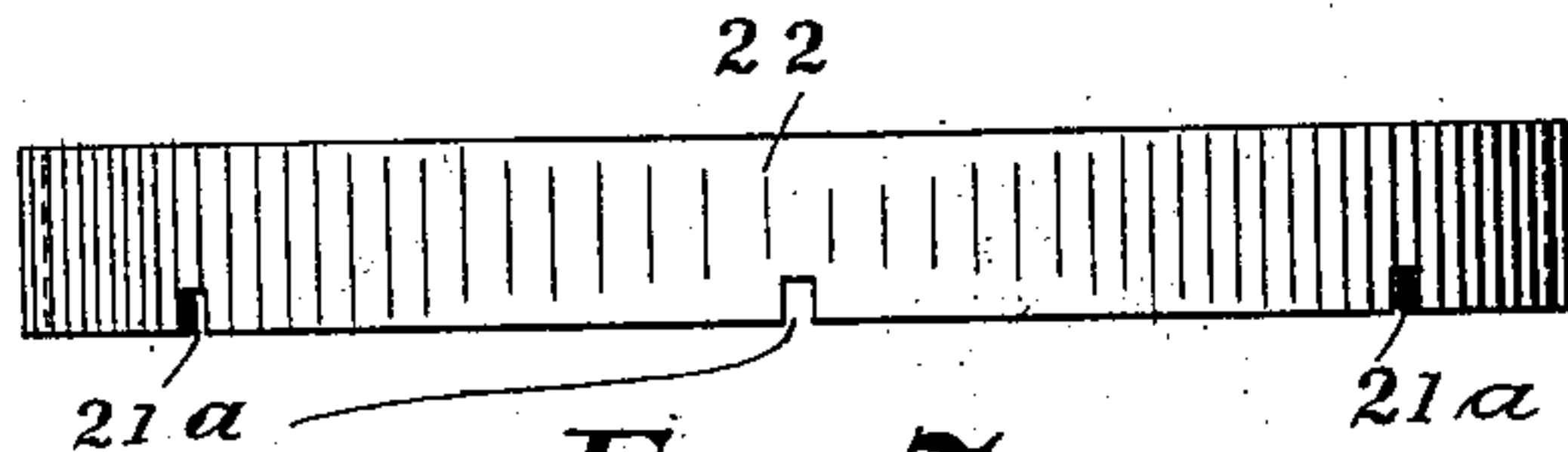
**3 Sheets—Sheet 2.**

*Fig. 2.*



**WITNESSES:**

W. E. Pringle  
Gov. C. C. C.



*Fig. 7.*

***INVENTOR***

Frank Nether.

BY

BY  
Geo. H. Parmelee.  
his **ATTORNEY.**

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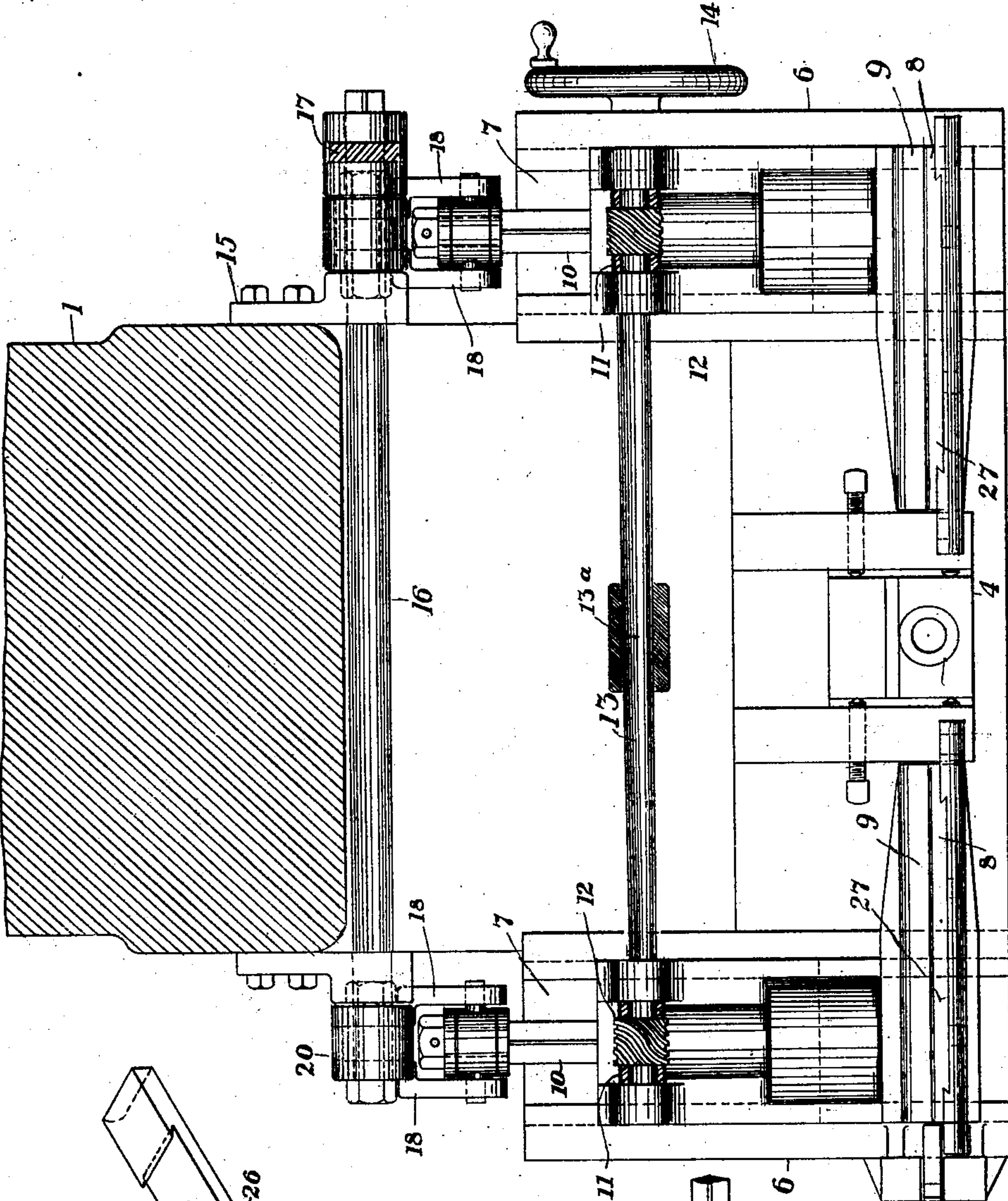


Fig. 3.

Fig. 6.

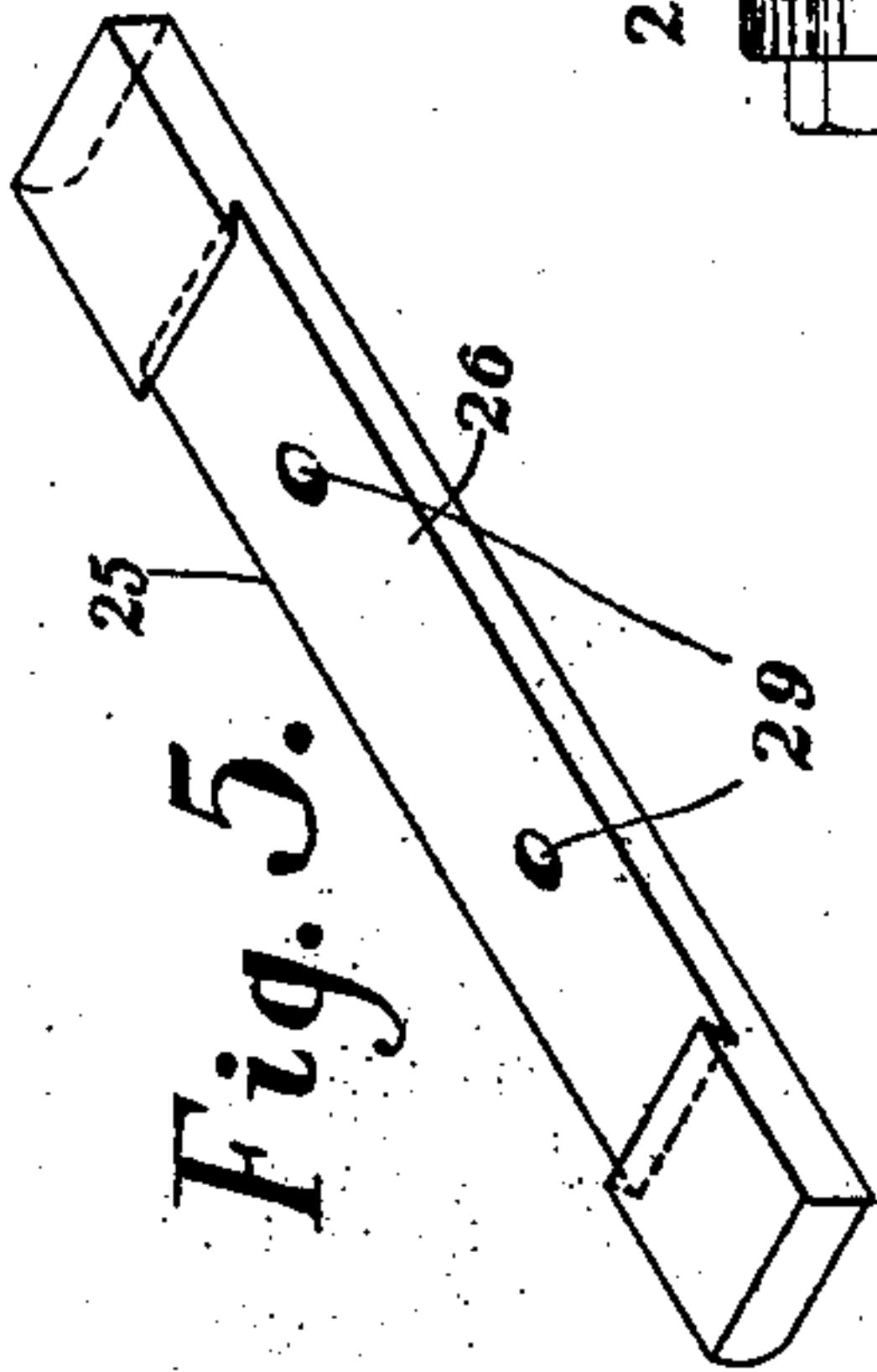


Fig. 5.

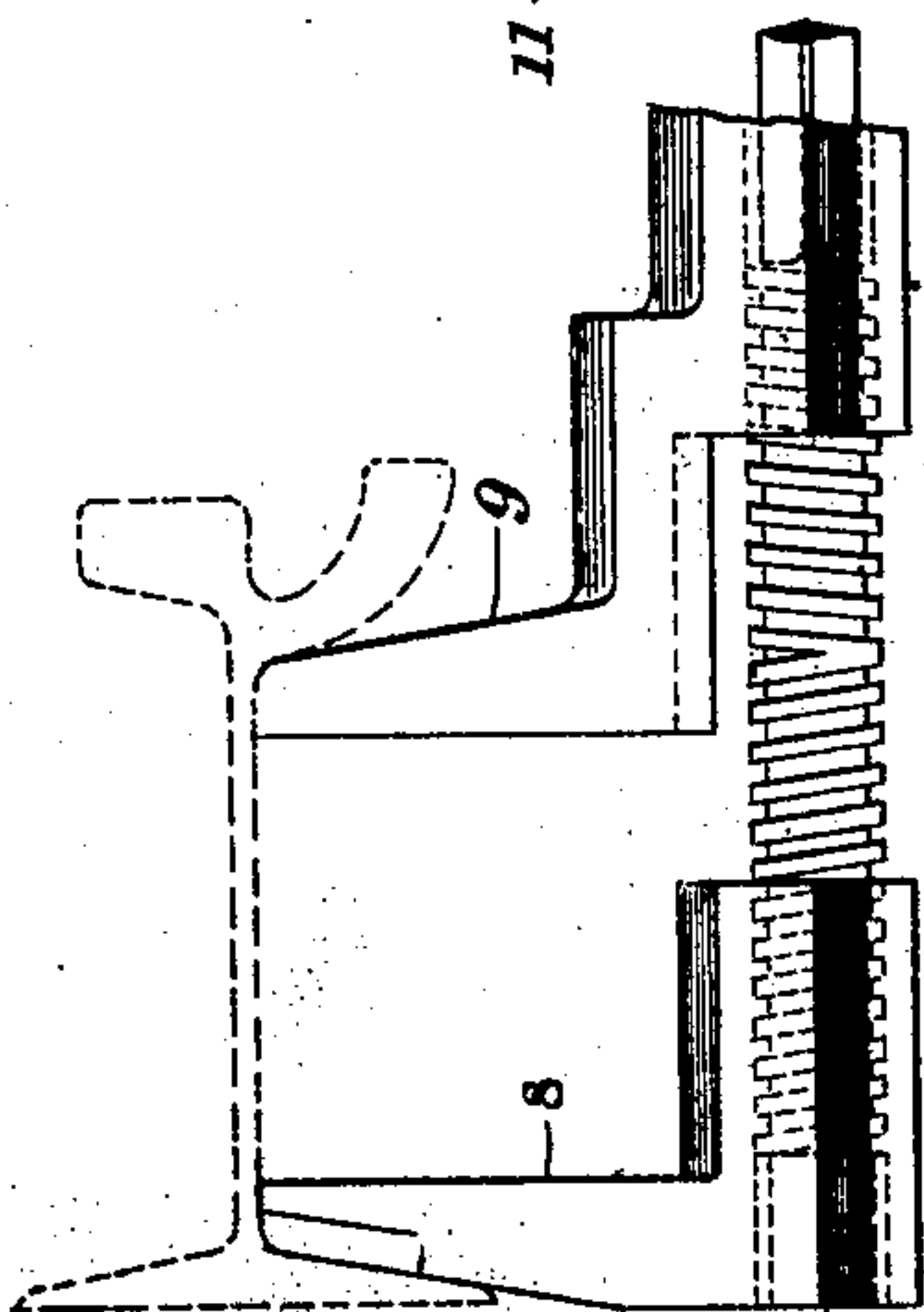
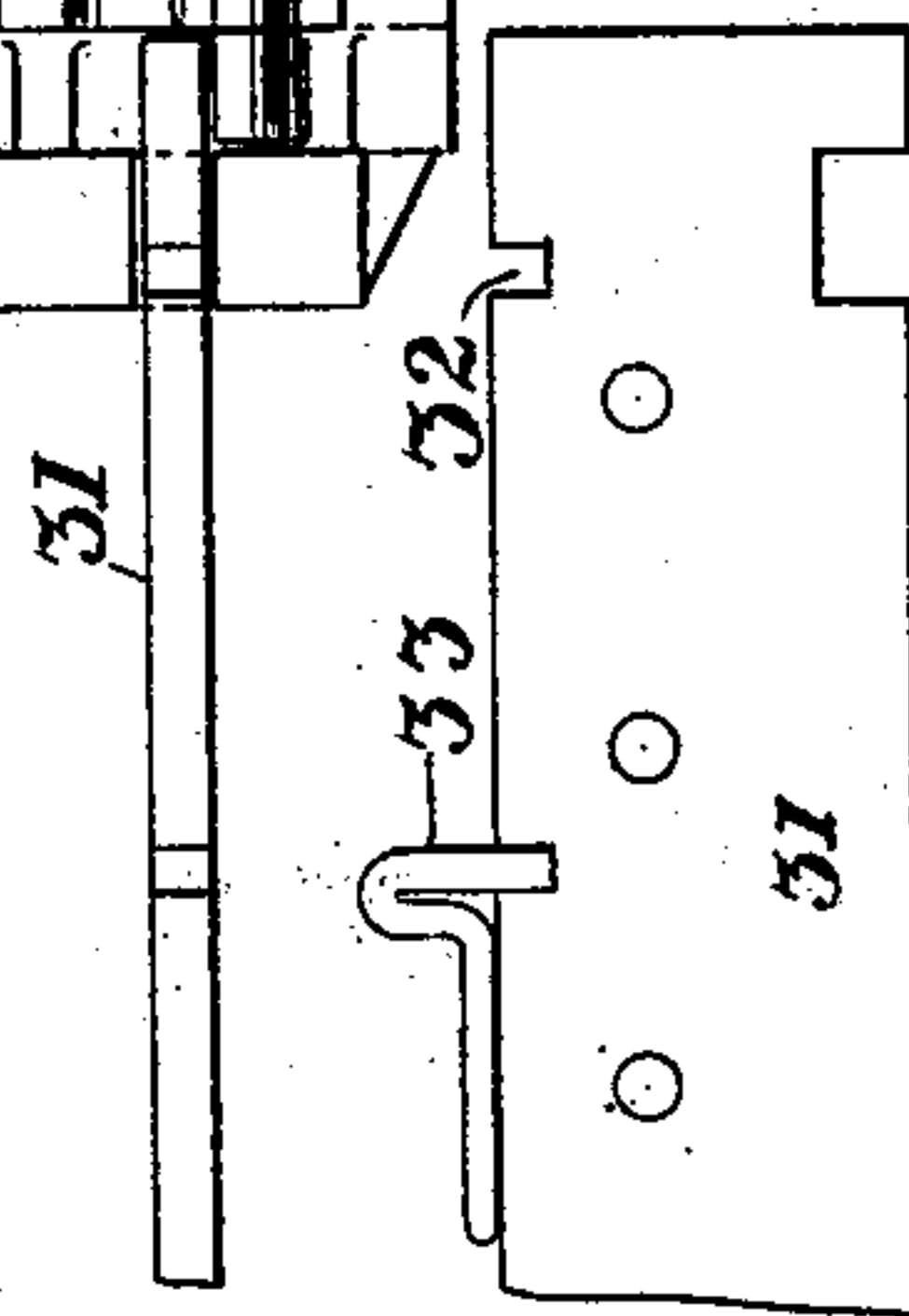


Fig. 4.



WITNESSES:

W. E. Trindle  
Cora E. Cox

INVENTOR

Frank Nather.

BY  
Geo. H. Parmelee,  
his ATTORNEY.



# UNITED STATES PATENT OFFICE.

FRANK NATHER, OF JOHNSTOWN, PENNSYLVANIA, ASSIGNOR TO THE  
LORAIN STEEL COMPANY, A CORPORATION OF PENNSYLVANIA.

## ADJUSTABLE GAGE ATTACHMENT FOR METAL-PERFORATING MACHINES.

SPECIFICATION forming part of Letters Patent No. 688,479, dated December 10, 1901.

Application filed March 18, 1901. Serial No. 51,810. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK NATHER, of Johnstown, in the county of Cambria and State of Pennsylvania, have invented a new and useful Improvement in Adjustable Gage Attachments for Metal-Perforating Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to an adjustable gage attachment for metal-perforating machines, such as punches and drills, and is designed to provide means of simple, novel, and efficient character whereby a piece of metal may be accurately punched or drilled without previously laying out and marking the positions of the holes.

My invention is particularly useful in connection with work in which certain standard punchings or drillings are frequently used, as in railway-rails and rail-sections, beams, channels, and other structural shapes, but may be employed to advantage wherever the same character of punching or drilling is used with sufficient frequency to justify the making of the simple templets hereinafter described.

Generally considered, my invention consists in the combination, with a metal-perforating machine, of an adjustable work-support, means for adjusting said support to shift the longitudinal center line of the work transversely with respect to the perforating-tool, to thereby determine and vary the position of the holes with respect to said center line, interchangeable templets which govern the said adjustments in accordance with the predetermined design or standard, and other interchangeable templets which are used to determine the location of the holes longitudinally in the work. I prefer also to give the work-support a second adjustment to adapt it to work of different widths, whereby the same machine and attachment may be used for various kinds of work. In any case, however, where the work is confined to one varying type this secondary adjustment is not a necessary feature of the invention.

My invention also consists in the novel construction, arrangement, and combination of

parts, all as hereinafter described, and pointed out in the appended claims, reference being had to the accompanying drawings, in which—

Figure 1 is a front elevation showing my invention applied to a power-operated punching-machine, the frame of the latter being broken away. Fig. 2 is a side view of the same. Fig. 3 is a horizontal section of the same; Fig. 4, a detail view of one pair of the work-supporting members or jaws; Fig. 5, an isometric perspective view of one of the interchangeable templets removed from the work-support; Fig. 6, a side view of a portion of the templet employed in connection with work of considerable length; Fig. 7, a detail view of one of the templets which control the position of the work-support with reference to the punch, and Fig. 8 a detail view of the adjustable pin used in connection with the templet shown in Fig. 5.

The numeral 1 designates the overhanging arm of the frame of the machine, in which is mounted a vertically-reciprocating punch-carrier 2.

3 designates a punch, and 4 an anvil-block, which is removably secured on the bed in the usual manner.

Secured to each side of the bed 5, in a manner which will be more fully described hereinafter, is a bracket 6, formed with a guideway 7, in which is mounted one of the supports now to be described. In the present instance each of these supports consists of two members or jaws (designated, respectively, by the numerals 8 and 9) whose bases are fitted to slide in the guideway 7. The base of each of these jaws is formed with a threaded bore to receive a rod or shaft 10, which has a right-hand thread engaging the bore of the jaw 8 and a left-hand thread engaging the bore of the jaw 9. On each of the shafts 10 is a spiral or worm gear 11, which meshes with a corresponding gear on a connecting-shaft 13, which is journaled in bearings on the jaw member 9. Those portions of the shafts 10 which carry the gears 11 are squared, and the gears are mounted to travel back and forth a limited distance on these squared portions. On one end of the shaft 13 is a hand-wheel 14, by means of which the said



shaft may be actuated. It will be readily seen that by turning the said wheel in one direction the two jaws of each work-support may be brought together, as shown in Fig. 2, thus adjusting them to receive a narrow piece of work, such as the T-rail shown in dotted lines in said figure, while by turning the wheel in the opposite direction said jaws or members may be separated to receive a wider piece of work, such as the high-section girder-rail shown in dotted lines in Fig. 4. The two threads of the rods or shafts 10 being of the same pitch, it is obvious that the jaws of each pair will move equal distances to or from a given center line with a given movement of the hand-wheel. As above indicated, in any case where but one style of work is to be done these adjustable jaws may be omitted and the work-support at each side of the punch may be made in a single piece arranged to slide in the guideway 7. In most cases, however, it will be desirable to employ the construction shown or its equivalent. The particular shape of the work-holding portion of the jaws may of course be varied by the mechanic to suit the particular kind of work in hand.

Journalled in brackets 15 on the vertical arm of the punch-frame is a rock-shaft 16, to one portion of which is secured a hand-lever 17. Connected to the lower short arm of this lever are links 18, which in turn are connected on the rear end portion of one of the rods or shafts 10. The rear end of the other rod or shaft 10 is connected by similar links to a depending arm 20 on the opposite end of said rock-shaft. The handle portion of the said lever is provided with a pivoted pawl-lever 21, which is designed to engage any one of a number of notches 21<sup>a</sup> in a curved templet 22, which is removably secured in a holder 23, secured to the side of the machine-frame. When the hand-lever is in the position shown in Fig. 2, with the pawl engaging the central notch of the templet 22, the work-supports, no matter what may be the degree of separation of their jaws, will be in such a position that the center line of the work-support is directly underneath the punch. By shifting said lever to the right both work-supports are moved bodily outward, thus shifting to a corresponding extent the center line of the work with reference to the punch, while a movement of said lever to the left will in a similar manner shift the center line of the work inwardly with respect to the punch. The positions of the hand-lever are controlled by the location of the notches in the templet 22, and different templets will be employed, according to the nature of the work. By this arrangement it will be seen that the work can be readily shifted to provide for staggered or parallel rows of punchings according to any given design, provided a proper templet is used. The longitudinal location of the holes is determined by means of templets 25, one of which

is removably secured to the upper portion of each of the jaws 8 in any suitable manner. In the drawings I have shown the inner face (see Fig. 5) of these templets as provided with a dovetailed recess 26, which is arranged to fit over a corresponding projection 27 on the jaws 8. Each of these templets is formed with a number of horizontal pin-holes 29 to receive a pin 30, such as shown in Fig. 8. The number and location of these holes will vary in each templet according to the particular arrangement of holes to be punched or drilled in the work.

Referring to Fig. 3, and supposing the work to be introduced to the machine from the right-hand side, the pin 30 would be inserted in the first hole 29 in the templet at the left-hand side of the punch and the work would be moved through the machine until its end came in contact with and was stopped by the said pin. If the location of this hole 29 is, for instance, three inches from the center of the punch, it is obvious that if the punch now be operated the center of the hole made must be three inches from the end of the work. The pin would then be shifted to the next hole and the work again moved into contact therewith. If punching is to be done at both ends of the piece, after the left-hand end has been punched the pin would be shifted to the templet at the right-hand side of the punch and the work then moved back through the machine into contact therewith, the pin being shifted, as before, for each hole. The purpose, therefore, of providing one of these templets at each side of the punch is to enable both ends of a piece of work to be punched in the machine without requiring the work to be removed and turned around end for end. It is obvious that if a different punching is required for the two ends the two templets may have their holes differently arranged, and, if necessary, after one end is punched the hand-lever may be operated to vary the location of the holes at the other end with respect to the center line of the work or to effect a staggered punching. Where the work to be punched or drilled is of considerable length, I provide in addition to the templets 25 an extended templet 31, a portion of which is shown in Figs. 3 and 6. This templet consists of an elongated bar or plate one end of which is removably supported on one of the brackets 6 and which extends laterally of the machine parallel to the line of movement of the work. In this plate are formed a series of holes to receive the pin 30 in the same manner as the holes 29 of the templets 25. For certain classes of work, however, which would not come in contact with pins inserted in these holes the upper edge of the said bar or plate is formed with notches 32 to receive a movable stop 33, which performs the same function as the pin 30. It is of course necessary to provide different bars for different standards of work.

For the purpose of adjustment the holes



for the bolts 35, which secure the brackets 6 to the machine-frame, may be made oblong, and a wedge-shaped piece 36 may be seated between the lower edge of the bracket and a bearing-piece 38. By slackening the nuts of the bolts 35 and also the nut of the bolt 37, which secures the wedge-piece in place, the latter may be moved to raise or lower the brackets.

10 The shaft 13 is preferably made in two sections connected by a coupling 13<sup>a</sup> to facilitate the application and removal of the attachment to and from the machine.

15 It is obvious that while for purposes of illustration I have shown my invention as applied to a punching-machine the construction, arrangement, and operation of the invention will in all respects be substantially the same when applied to a drill-press, as a mere substitution of the usual rotary drill-spindle and drill in place of the reciprocating punch-carrier and punch shown in the drawings in no way affects the invention.

20 I do not desire to limit myself to the particular construction, arrangement, and combination of parts which I have herein shown and described, as it will be obvious that various changes may be made in the details thereof without affecting the spirit and scope of my invention.

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

30 1. The herein-described adjustable gage attachment for metal-perforating machines, consisting of a work-support reciprocally mounted on the frame of the machine, means for adjusting said support to shift the longitudinal center line of the work transversely with respect to the perforating-tool, an interchangeable templet for governing such adjustments, and an interchangeable templet for determining the longitudinal position of the holes.

35 2. The herein-described adjustable gage attachment for metal-perforating machines, consisting of a work-support movably supported on the frame of the machine, means for adjusting said support to vary its width without changing its center line, other means for adjusting said support to shift its center line, a templet for determining the last-named adjustment, and a second templet for determining the longitudinal position of the holes to be perforated.

40 3. The combination with a metal-perforating machine, of laterally-movable work-supports mounted on the anvil-carrying portion of the machine, said supports consisting each of two jaws or members, means for moving said jaws or members toward and away from each other, and means for adjusting the supports as a whole to shift their center line with respect to the perforating-tool.

45 4. The combination with a metal-perforating machine, of laterally-movable work-supports mounted on the anvil-carrying portion

of the machine, said supports consisting each of two jaws or members, means for moving said jaws or members toward and away from each other, means for moving the supports as a whole to shift their center line with respect to the punch or drill, a templet for determining such movement, and other templets which determine the longitudinal positions of the holes to be perforated.

5. The combination with a metal-perforating machine, of a pair of work-supports slidably mounted on the base portion of the machine, one pair at each side of the perforating-tool, and consisting each of a pair of separate members or jaws, a rod or shaft having threads of opposite hand engaging the respective jaws of each pair, means for turning the said rods or shafts, and a hand-lever connected to said rods or shafts whereby they may, together with the said jaws or members, be moved laterally with respect to the perforating-tool.

6. The combination with a metal-perforating machine, of a pair of work-supports slidably mounted on the base portion of the machine, one pair at each side of the perforating-tool, and consisting each of two jaws or members, oppositely-threaded rods or shafts engaging said jaws or members, means for simultaneously rotating said rods or shafts, and a hand-lever connected to both rods or shafts, to effect an endwise movement thereof and thereby of the said members or jaws.

7. The combination with a metal-perforating machine, of the work-supports consisting each of two separate jaws or members arranged to slide transversely in guideways on the machine-frame, at opposite sides of the perforating-tool, the oppositely-threaded rods or shafts engaging said jaws or members, the sliding spiral or worm gears mounted on the said rods or shafts, the connecting-shaft having gears which mesh with those on the rods or shafts, and means for rotating the said connecting-shaft.

8. The combination with a metal-perforating machine, of the work-supports slidably mounted at opposite sides of the perforating-tool, the rods or shafts connected thereto, a rock-shaft, a hand-lever secured thereto, connections between the rock-shaft and the first-named rods or shafts, a pawl-lever carried by the hand-lever, and a notched plate or templet removably secured to the frame of the machine and having notches to be engaged by the pawl end of said pawl-lever.

9. The combination with a metal-perforating machine, of the work-supports slidably mounted thereon at opposite sides of the perforating-tool, and consisting each of two separate jaws or members, means for adjusting said jaws or members to vary the degree of their separation, means for laterally shifting the supports as a whole, and perforated templets or gage-plates removably secured to one jaw or member of each support.

10. The combination with a metal-perforating machine, of vertically-adjustable brackets



secured to the frame of the machine at opposite sides of the perforating-tool, said brackets each having a transversely-extending guideway therein, a pair of work-supporting members mounted in each of said guideways, a threaded rod or shaft engaging each pair of the work-supporting members, means for rotating said rods or shafts, and means for effecting endwise movement thereof.

10 11. In a metal-perforating machine, the combination with laterally-shiftable work-supports, and a lever for shifting said supports, of a removable notched plate or templet, arranged to be engaged at different  
15 points by the said lever.

12. In a metal-perforating machine, the combination with work-supports, and means for shifting the same transversely with respect to the perforating-tool; of gage plates

or templets, and a movable stop arranged to 20 engage any one of a number of slots in said plates or templets in the path of movement of the work through the machine.

13. In a metal-perforating machine, the combination with the transversely-movable 25 work-supporting members, and the threaded rods or shafts engaging the said members, of the rock-shaft, the hand-lever secured to said shaft, and universal-joint connections between said rock-shaft and the said threaded 30 rods or shafts.

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

FRANK NATHER.

Witnesses:

CORA G. COX,  
H. W. SMITH.