

No. 786,853.

PATENTED APR. 11, 1905.

E. A. STICKNEY.  
MULTIPLE PUNCHING MACHINE.

APPLICATION FILED MAY 3, 1904.

4 SHEETS—SHEET 1.

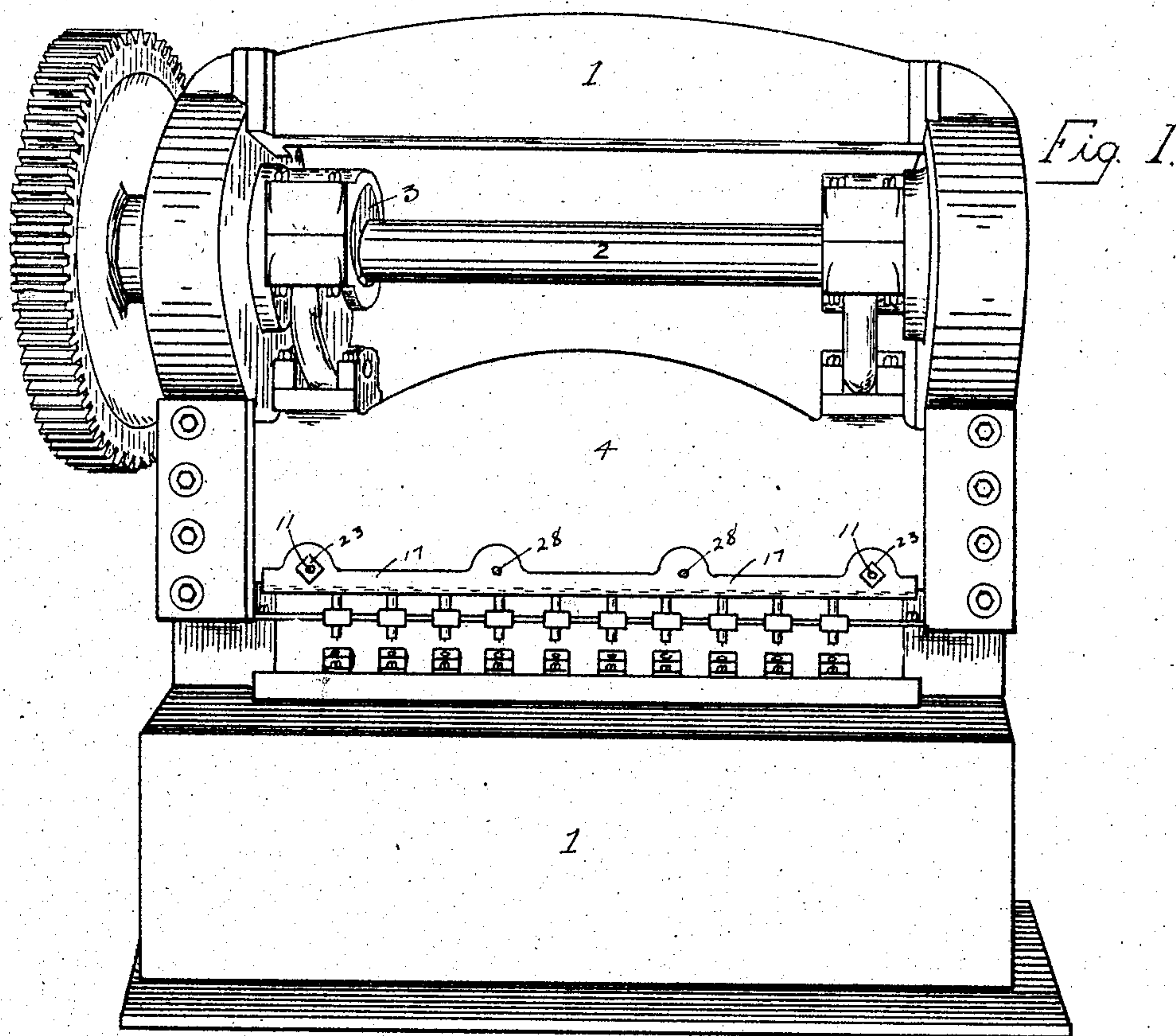


Fig. 6.

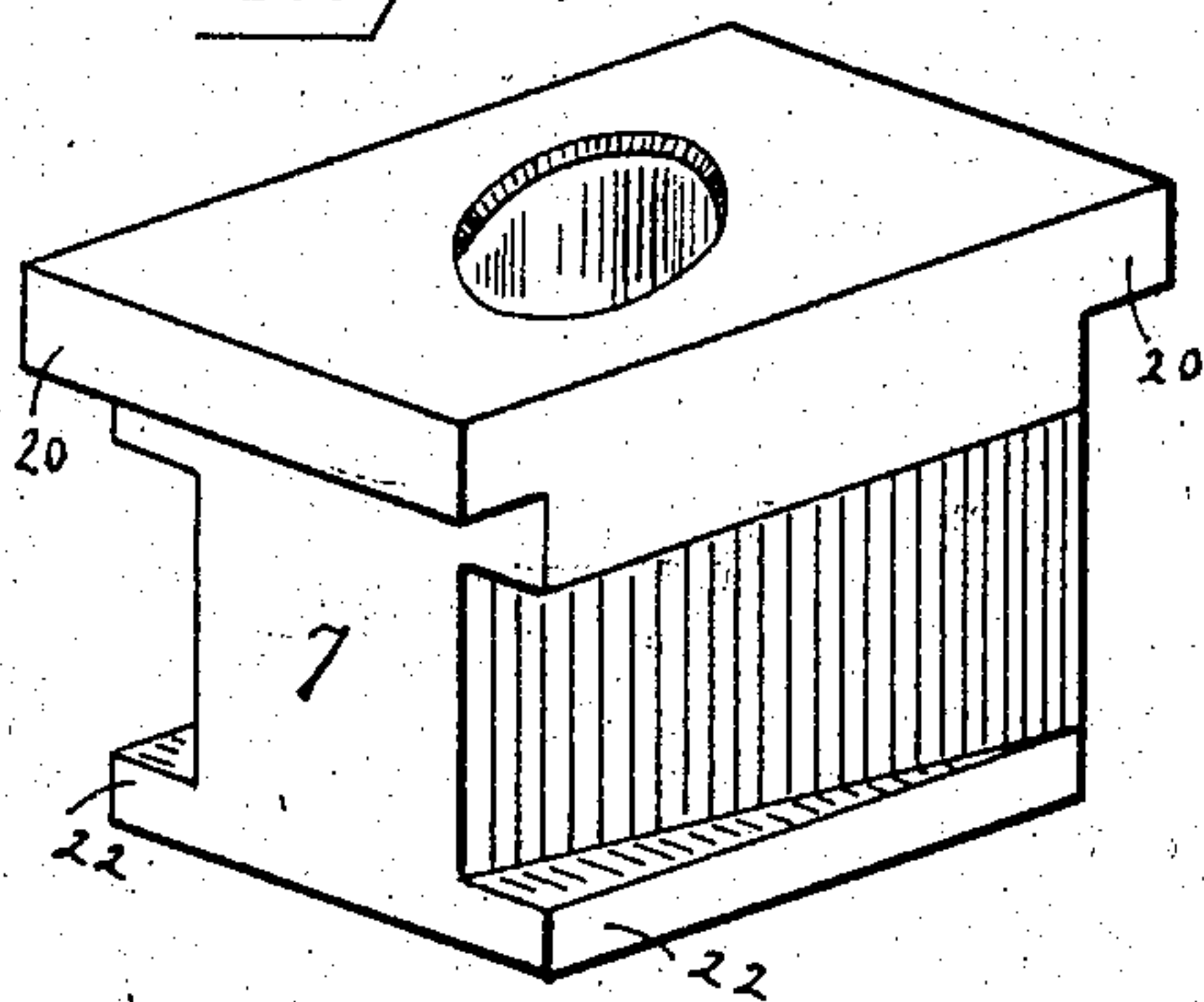


Fig. 7.

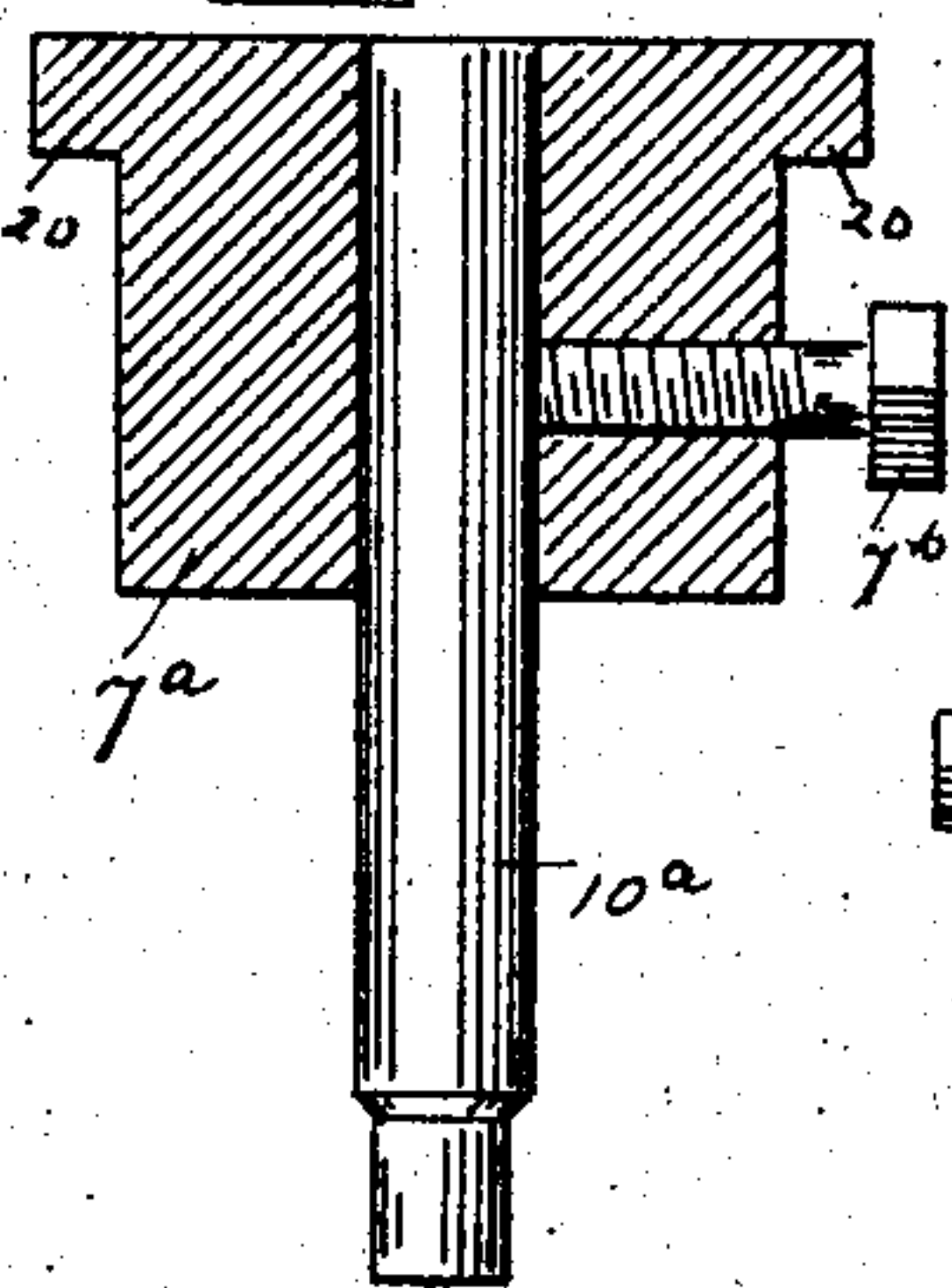
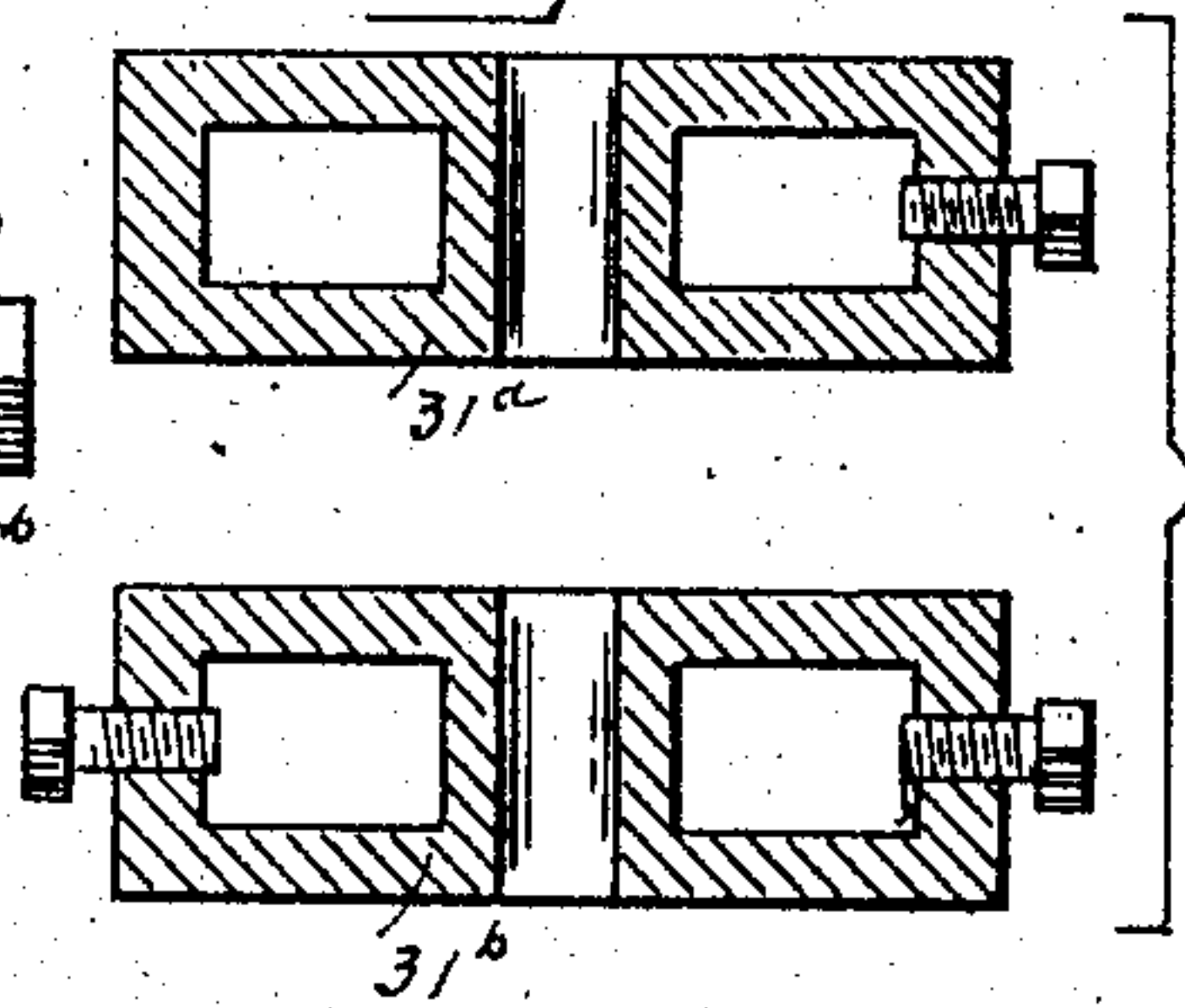


Fig. 8.



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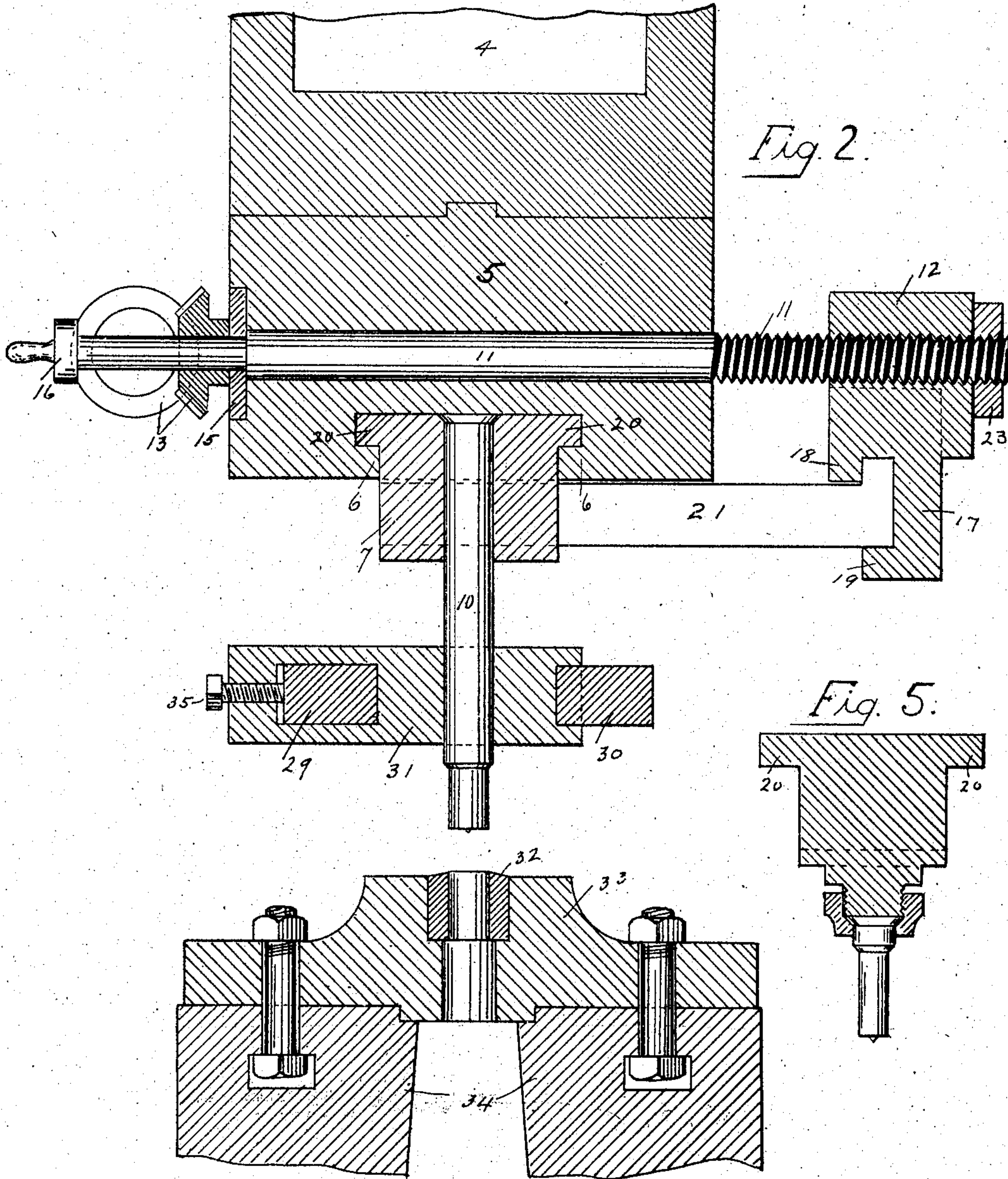
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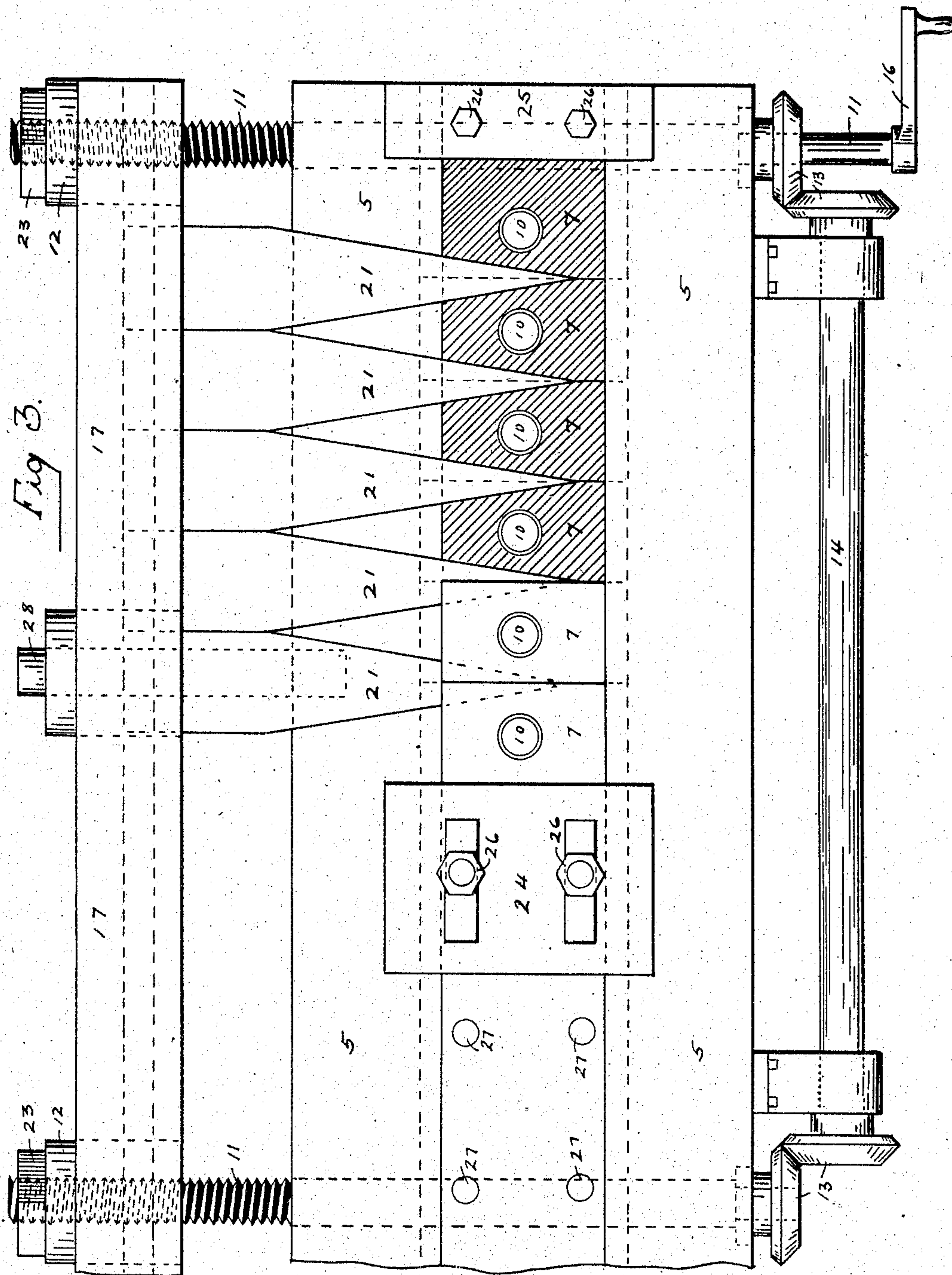
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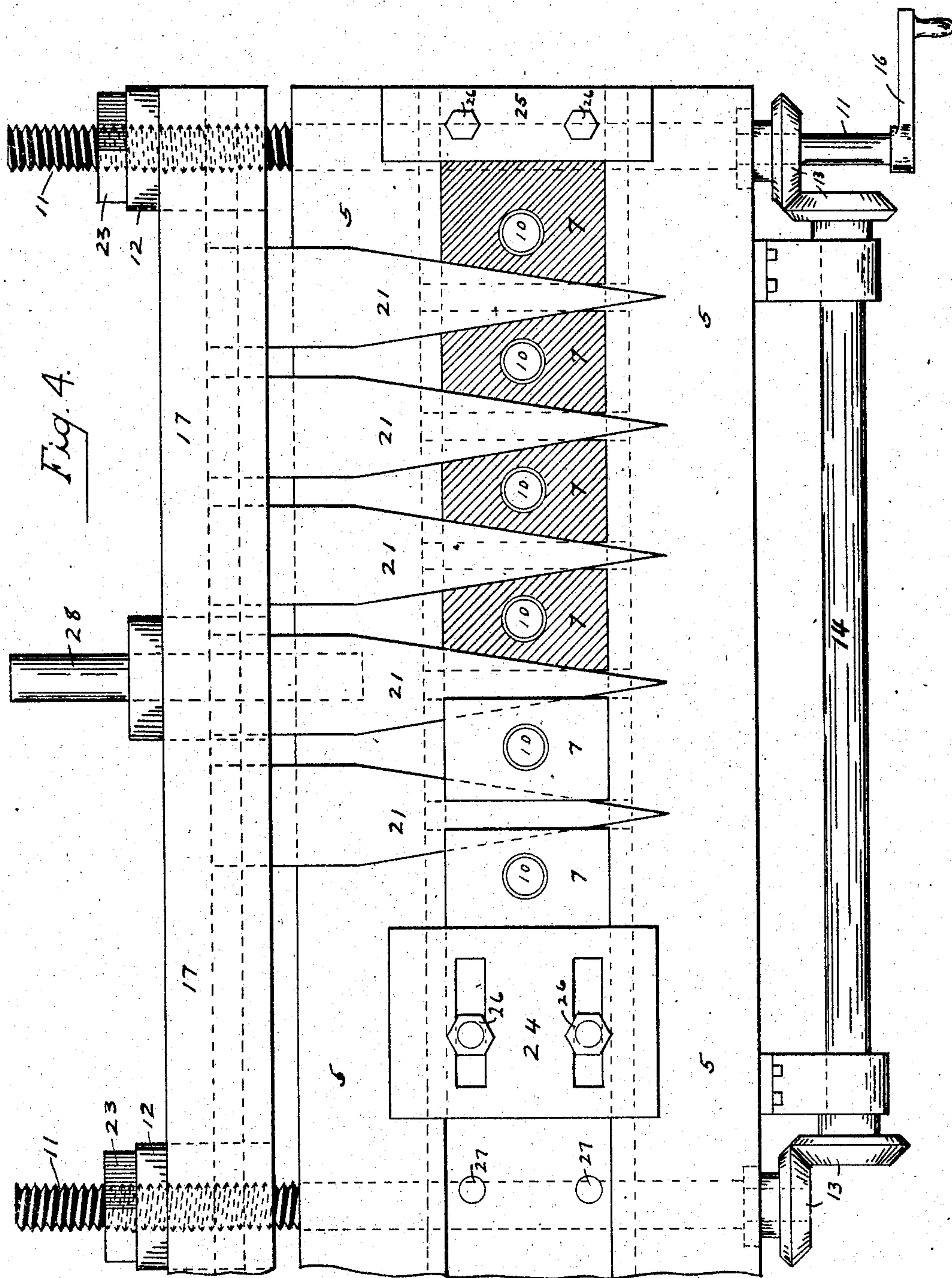
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# UNITED STATES PATENT OFFICE.

EDGAR ALLEN STICKNEY, OF SACRAMENTO, CALIFORNIA.

## MULTIPLE PUNCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 786,853, dated April 11, 1905.

Application filed May 3, 1904. Serial No. 206,149.

*To all whom it may concern:*

Be it known that I, EDGAR ALLEN STICKNEY, a citizen of the United States, residing at Sacramento, in the county of Sacramento and State of California, have invented certain new and useful Improvements in Multiple Punching-Machines, of which the following is a specification.

In multiple punching-machines as heretofore constructed, in which the punch holders or carriers are adjustable in a groove in the punch-bar, it is a very tedious operation to accurately set each punch a specified distance apart, especially so when there are a large number of such punches, and it is quite impossible to adjust them accurately for use in punching the holes in the round seams of cylinders which telescope and in which it is desired that the holes punched in the outside sheets shall register with those punched in the inside sheets, and, again, in multiple punching-machines as heretofore constructed, in which the punches pass through perforations in the punch-bar, it is necessary in order to accommodate a large range of work to have a number of such bars and a like number of die-holders of corresponding pitch, and also if it is desired to use the multiple punch in punching holes for inside and outside courses of telescoping cylinders it is necessary to provide a large number of punch-bars spaced for various thicknesses of material likely to be used.

In my present invention my primary object is to provide an improved construction whereby the punches are set at any desired pitch automatically, dispensing with all tedious operations attendant upon setting the punches by the old method and also dispensing with the large number of punch-bars needed to accommodate a large range of work.

A further object of my invention is to provide an adjustable stripping mechanism which also acts as a guide to the punches.

I attain these and other incidental objects by the novel combination and arrangement of parts more fully set forth hereinafter, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a perspective view of a multiple punching-machine constructed in accordance with this invention. Fig. 2 is a transverse section of a part of the same on an enlarged scale. Fig. 3 is a view, partly in section, looking upward of the punch-bar, punch-holders, stop-blocks, and wedges together with the mechanism for moving said wedges. Fig. 4 is the same view as Fig. 3, showing the punch-holders at a different pitch. Figs. 5 and 7 are modifications of my invention, showing different styles of punches which may be employed. Fig. 6 is a perspective view of one of the punch-holders. Fig. 8 is a modification of my invention, showing different styles of punch-guides which may be employed or used on the stripping-bars.

Similar numerals refer to similar parts throughout the several views.

The fixed frame 1 of the machine has bearings for a shaft 2, which is rotated by any of the means used for such purpose and is provided with the usual eccentrics 3, whereby a vertical reciprocating motion is imparted to the sliding cross-head 4, the latter being suitably guided at its ends in vertical ways on the fixed frame of the machine. The punch-bar 5, Fig. 2, is adapted to be secured to the sliding cross-head 4 in any suitable and substantial manner. On the under side of the punch-bar 5 is a groove extending the entire length thereof and formed with undercut ribs 6 for supporting the punch holders or carriers 7 and the stop-blocks 24 and 25, Figs. 3 and 4, said punch-holders and stop-blocks being mounted slidably in said groove. The punch-holders 7 are provided with an opening for the reception of the punches 10, the upper end of said openings being made somewhat larger, so that the punches, which have correspondingly larger heads, will not drop out, the stem fitting snugly into the lower portion of the opening and the head fitting into the enlarged upper portion thereof, or each punch-holder 7<sup>a</sup> may be provided with a set-screw 7<sup>b</sup> for securely holding the punch 10<sup>a</sup> in position in the opening, as exhibited in Fig. 7. By this arrangement the removal or insertion of a punch may be quickly made without disturbing the other punches. Passing through the punch-



bar 5 are two or more shafts 11, rotative therein, having one end threaded for the reception of correspondingly-threaded nuts 12 and the other end provided with miter-gears 13, communicating with each other by means of the shaft 14, (see Figs. 3 and 4,) which is suitably journaled to the punch-bar 5. The shafts 11 are held against longitudinal movement by means of the collars 15 or any other suitable means. On one of the shafts 11 or on the shaft 14 is a crank 16. The object of this arrangement of miter-gears and crank is to provide a uniform simultaneous rotation to the several shafts 11 when adjusting the punch-holders. The nuts 12 are formed, preferably, integral with the bar 17, which may be of any length, reference being had to the length of the punch-bar, and is provided with an undercut rib 18 and lug 19, the undercut rib serving to draw the wedges back and the lug acting as a retaining-support. The punch-holders 7 are each formed with a lug 20 on each end, which slides in the undercut in the groove in the punch-bar 5. They are also formed with tapering grooves on each side, in which slide the wedges 21, the lower part of the groove forming a flange 22, (see Fig. 6,) which affords a support for the wedges.

23 represents lock-nuts employed to secure the shafts 11 against movement after the punch-holders have been set.

24 and 25 (see Figs. 3 and 4) are adjustable stop-blocks secured slidably in the groove in the punch-bar 5 for limiting the movement of the punch-holders 7 and wedges 21.

26 represents clamp-screws for securing the stop-blocks in a fixed position.

27 represents threaded perforations made in the punch-bar to provide for changing the position of the stop-blocks, one or both of which have slotted portions for the same purpose and through which the clamp-screws pass. Projecting outwardly from the punch-bar 5 and firmly embedded or secured therein are supporting bars or shafts 28. These pass through proper openings in the bar 17 and support it in a sliding position. In Figs. 3 and 4 but one of such bars 28 is shown.

There may be several. The shafts 11 also act as supports for holding the bar 17 in position.

When all the various parts, as hereinbefore mentioned, are placed in position, as indicated by the drawings, (see Figs. 3 and 4,) and the shafts 11 revolved, by means of the crank 16, miter-gears 13, and shaft 14, in a direction to cause the nuts 12 to be drawn toward the punch-bar, the wedges 21 will be forced, by reason of the bar 17 pressing against them, between the punch-holders 7, causing them to be moved apart. As the wedges 21 are all the same size and have the same degree of inclination of their sides and as the advance of the bar 17 is uniform, the distance apart of the punch-holders, which are all the same size, will be a uniformly-increasing distance

and the distance apart of each punch-holder. Consequently each punch will bear the same ratio to the entire distance between the two end punches. In the drawings the two end punch-holders are shown with a flat side next to the stop-blocks. The sides may be tapering the same as the intermediate punch-holders, in which case the form of the stop-blocks would be changed to correspond. Just below the punch-bar 5, Fig. 2, between it and the dies 32, is the stripper formed of the bars 29 and 30, upon which and adjustable thereon are the punch-guides 31, having openings through which the punches 10, fitting snugly, pass. The stripper-bars 29 and 30 are adjustably secured to the sides of the main frame of the machine by clamp-screws, so that under certain conditions one or both may be removed for the introduction of the punch-guides upon the same. Under some conditions of construction the adjustable stripper and guides may be omitted, in which case the stripping of the sheets placed thereunder and through which the punches pass will be accomplished in the ordinary manner. The dies 32 are secured in a recess in the die-blocks 33, which are adjustably mounted on the anvil 34 in any suitable and well-known manner. The punches having been set, the punch-guides are secured to the bars 29 and 30 by set-screws 35 and the die-blocks 33 to the anvil 34, the ends of the punches having first been inserted into the opening in the dies, so that they will exactly coincide and register with the punches as they pass up and down through the material placed thereunder and upon which work is to be performed.

By the peculiar arrangement of the punch-holders with the wedges it is manifest that any required distance within the scope of the machine may be quickly, automatically, and accurately divided and that any variation in distance, such as the difference in the circumferences of two telescoping cylinders or pipes, may be quickly and easily made by changing the position of the stop-blocks and resetting the punch-holders, punch-guides, and die-blocks.

The particular form of punch shown in Fig. 2 is not absolutely essential to the carrying out of my invention. Any form of punch may be used—such, for instance, as shown in Figs. 5 and 7. Furthermore, it will be noted that various changes may be made in the details of construction without departing from the principle or sacrificing any of the advantages of this invention.

Multiple-punching machines having movable punch-holders are not new; but multiple-punching machines with self-adjusting punch-holders are new.

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

1. The combination in a punching-machine,



of a plurality of wedges having lugs, with a plurality of movable punch-holders provided with punches and having tapering grooves on each side in which slide said wedges, substantially as described.

2. In a punching-machine, the combination with a punch-bar having a groove formed with undercut ribs, a plurality of punch-holders, slidably mounted in said groove, and provided with punches and having tapering grooves on each side in which slide wedges, substantially as described.

3. The combination in a punching-machine, of a plurality of wedges having lugs, and a plurality of punch-holders provided with punches and slidably mounted in a groove in a punch-bar and having tapering grooves on each side in which slide wedges, with stop-blocks adjustably secured to a punch-bar, substantially as described.

4. In a punching-machine, the combination of a punch-bar carrying a plurality of punch-

holders provided with punches, and a plurality of wedges operating in tapering grooves in said punch-holders, a bar bearing against the ends of said wedges, threaded shafts operating in threaded nuts on said bar, lock-nuts on said threaded shafts for locking said bar securely in position, rods projecting outwardly from the punch-bar and passing through perforations in the said bar for supporting the same in sliding position, and means for revolving the several threaded shafts simultaneously for uniformly moving the aforesaid bar against the wedges, all substantially as described.

In witness whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDGAR ALLEN STICKNEY.

Witnesses:

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F. J. JOHNSTON.