

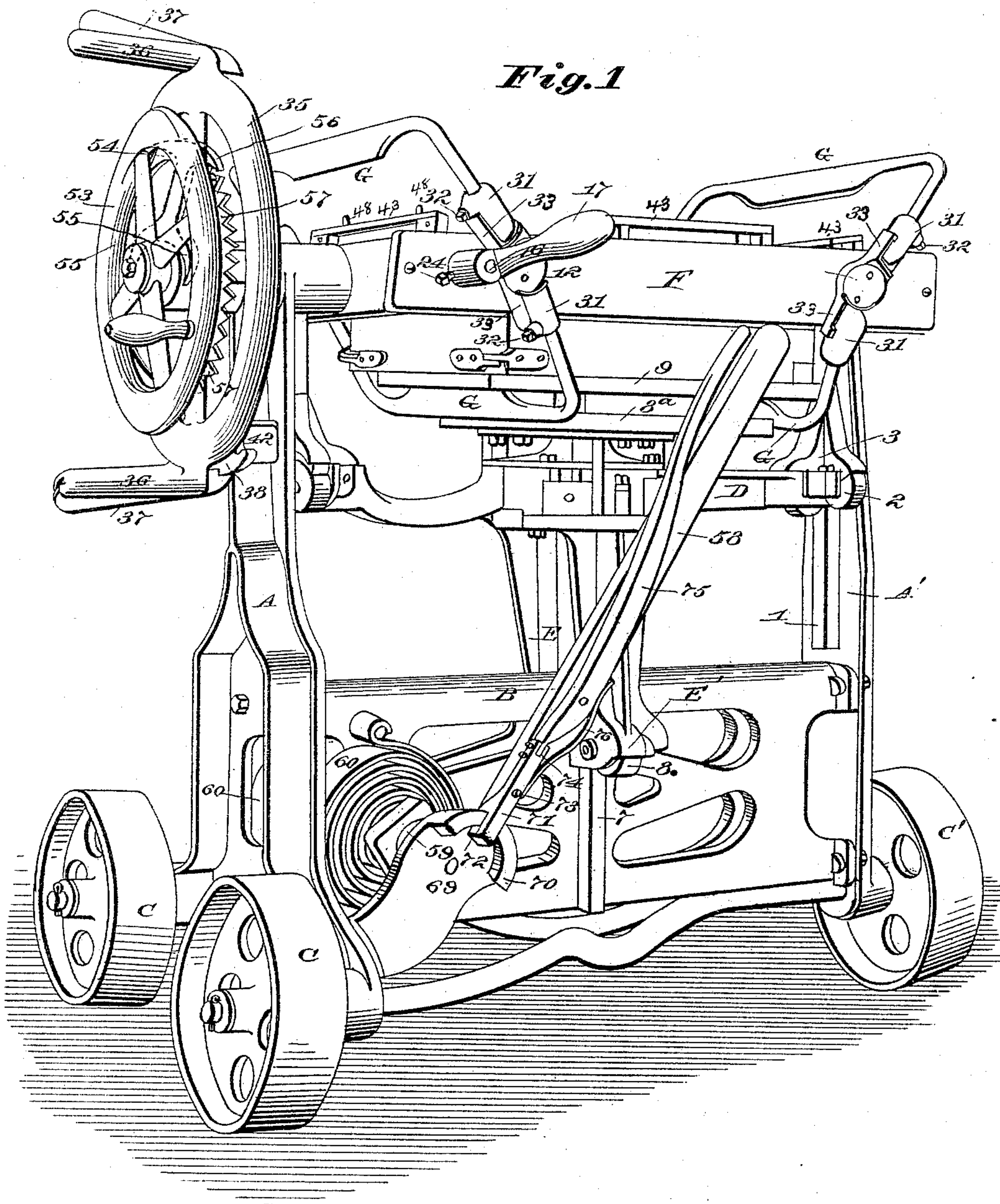
(No Model.)

4 Sheets—Sheet 1.

A. L. TEETOR.
MOLDING MACHINE.

No. 495,570.

Patented Apr. 18, 1893.



Witnesses
J. Coleman
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Inventor
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Attorney

(No Model.)

4 Sheets—Sheet 2.

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Fig. 2

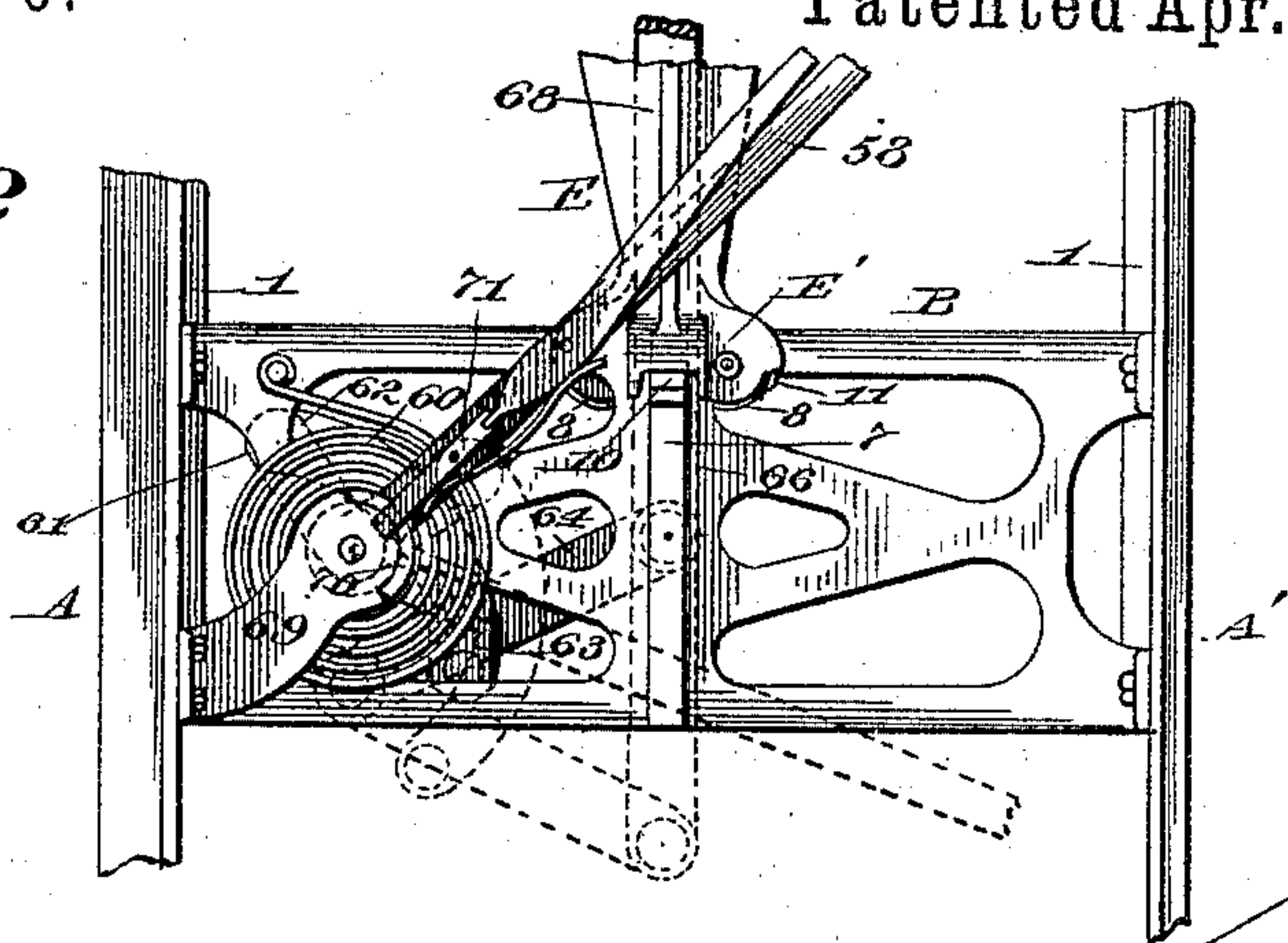


Fig. 3

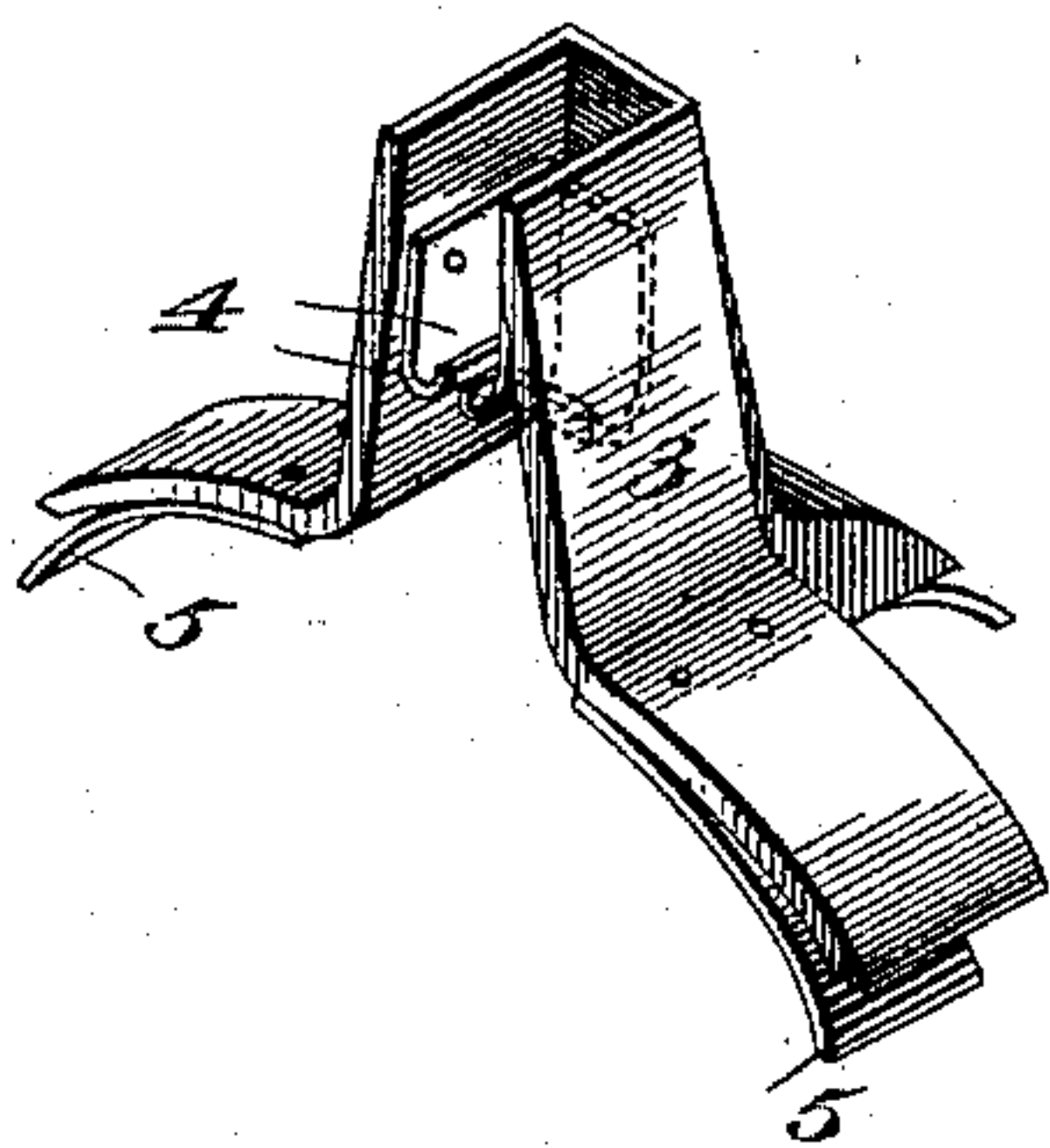


Fig. 5

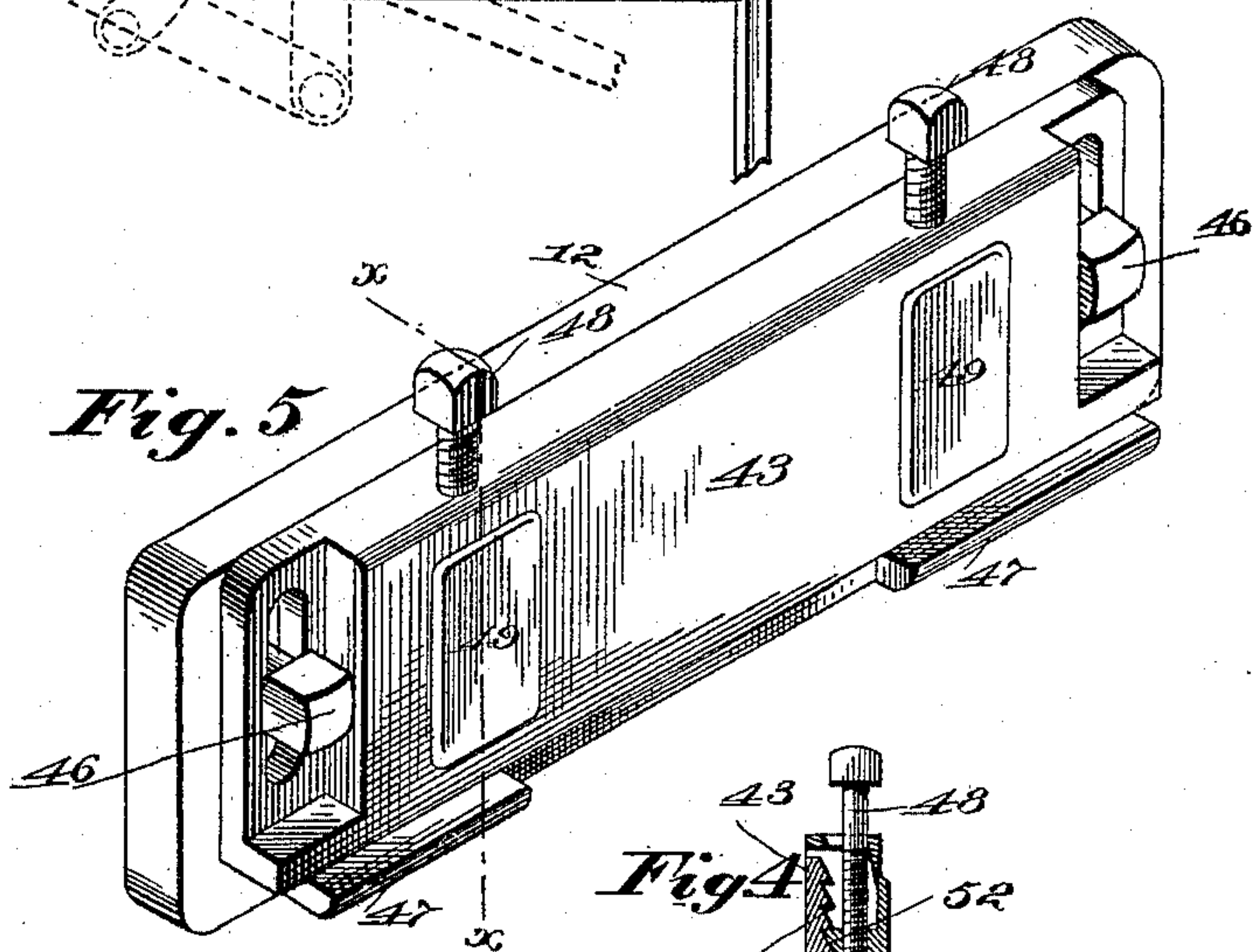


Fig. 4

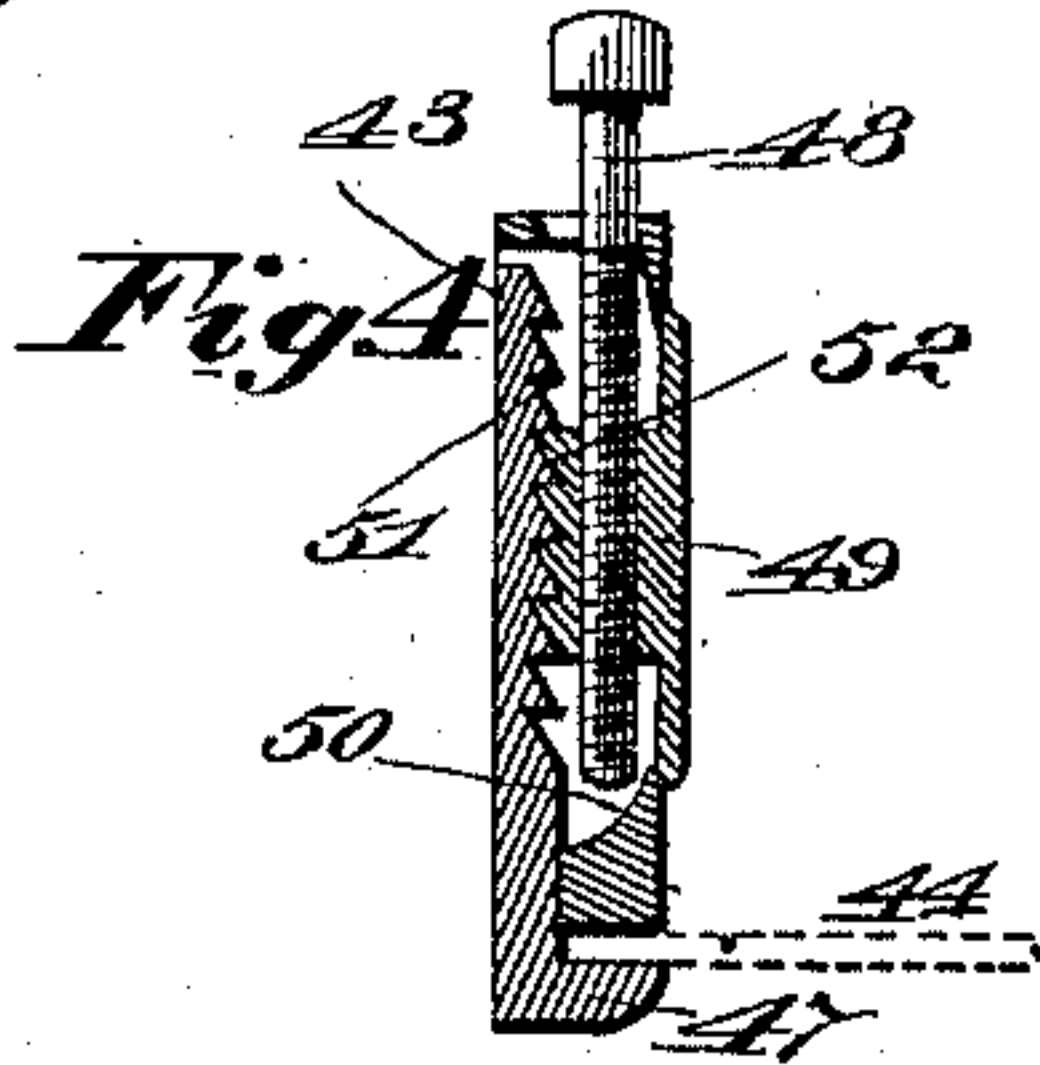


Fig. 6

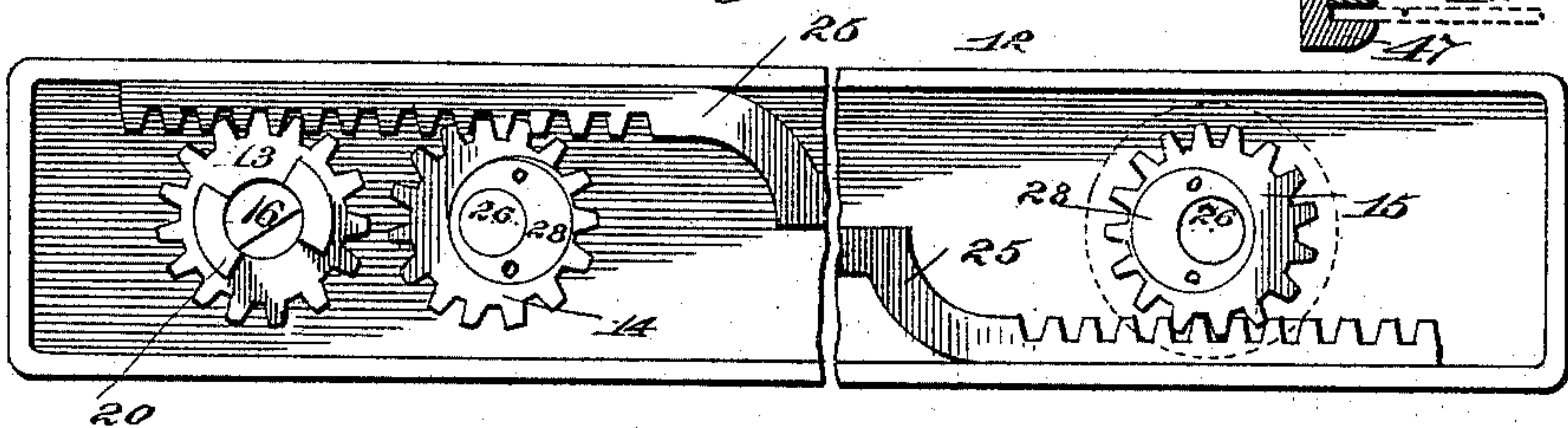


Fig. 9

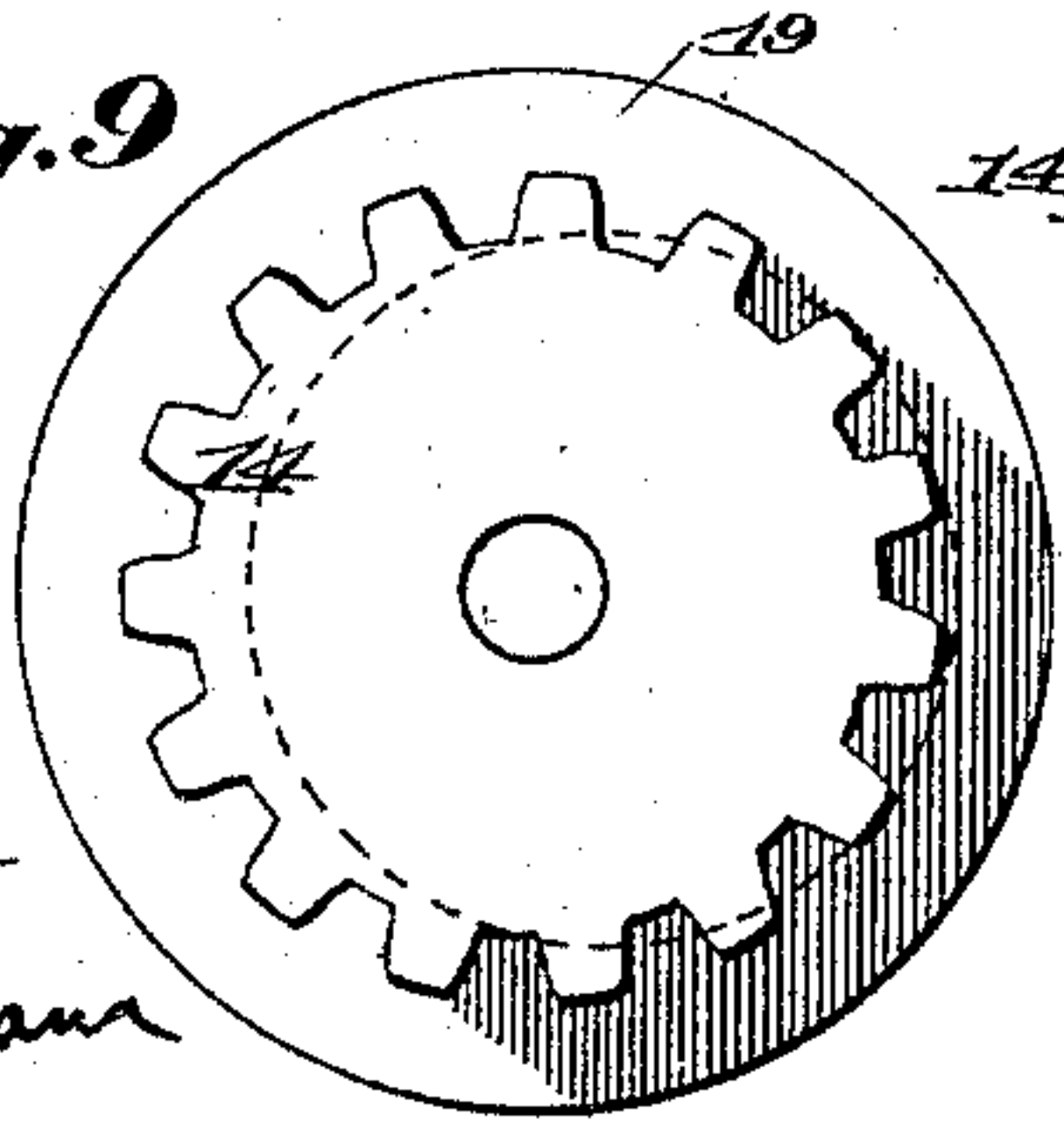
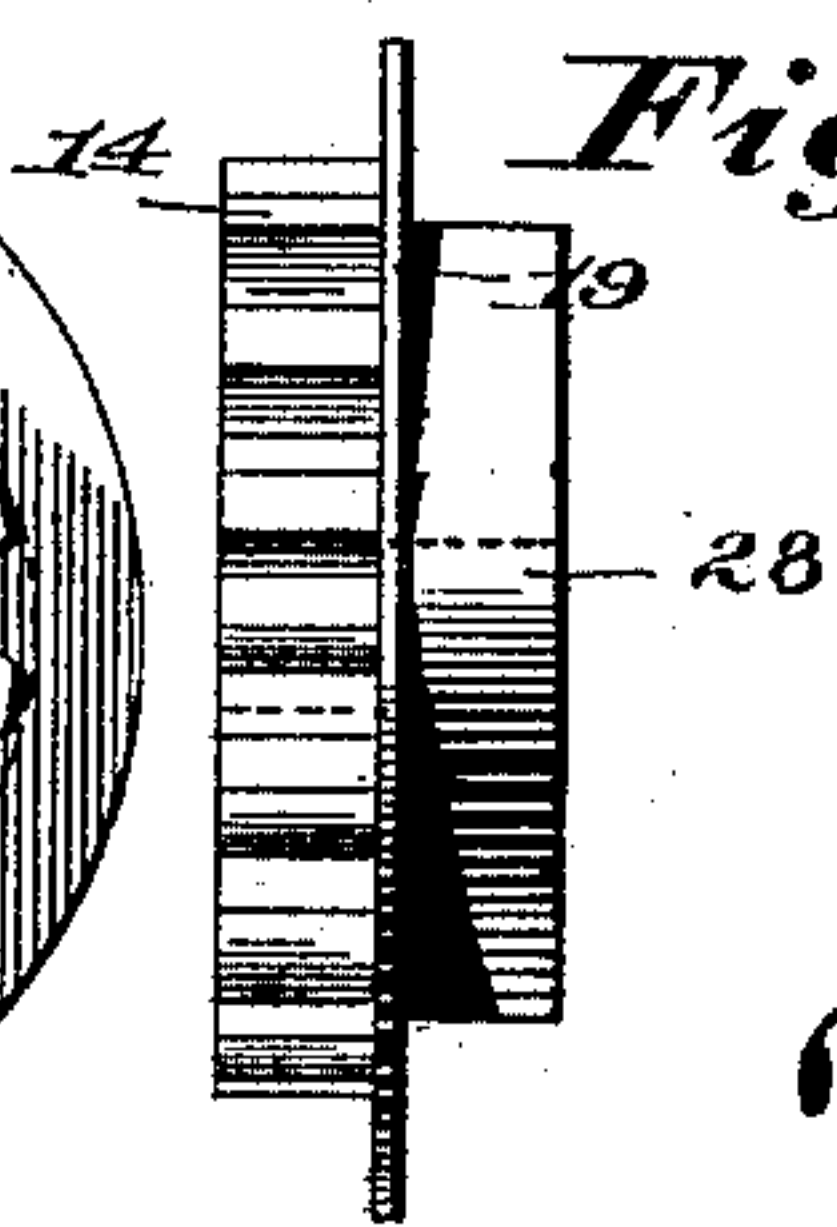


Fig. 9^a



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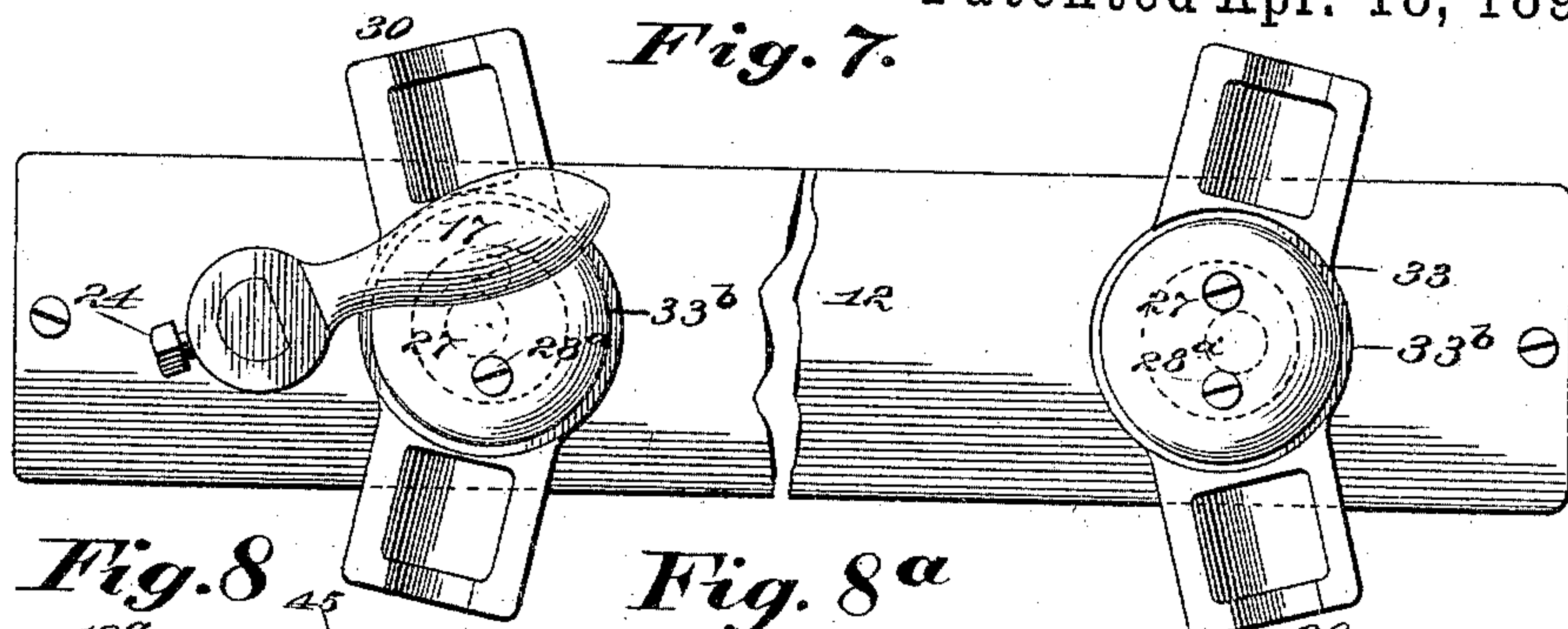


Fig. 8

Fig. 8a

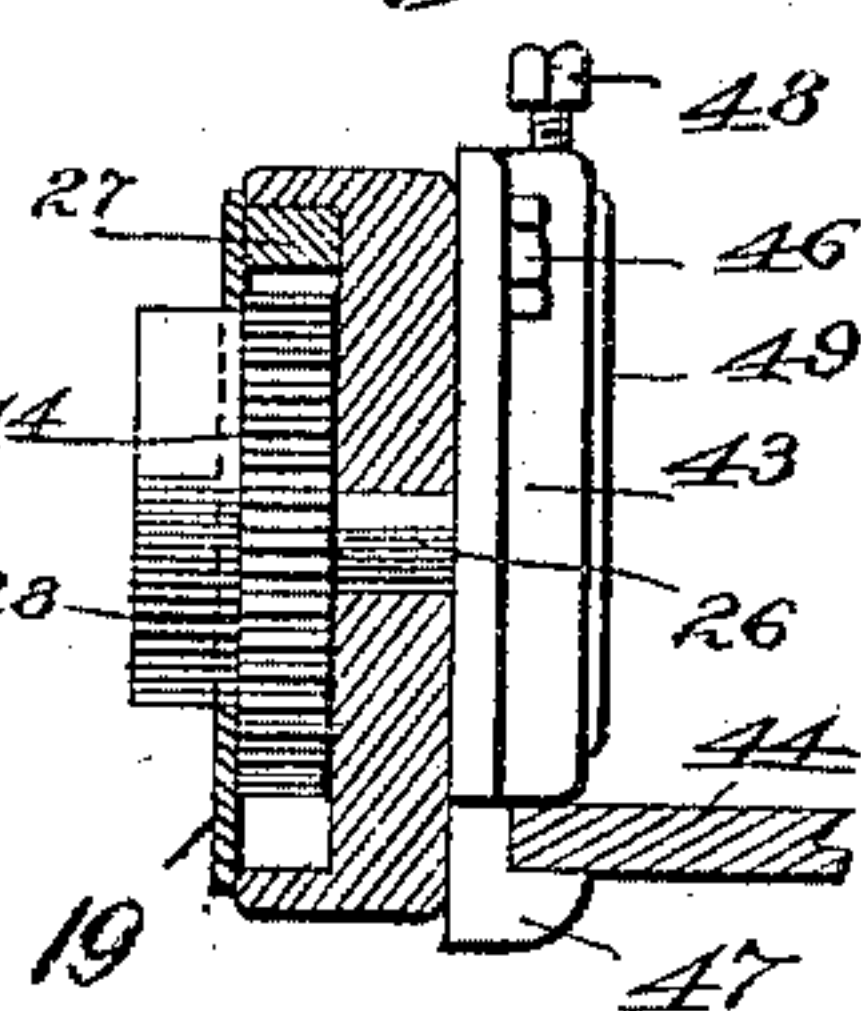
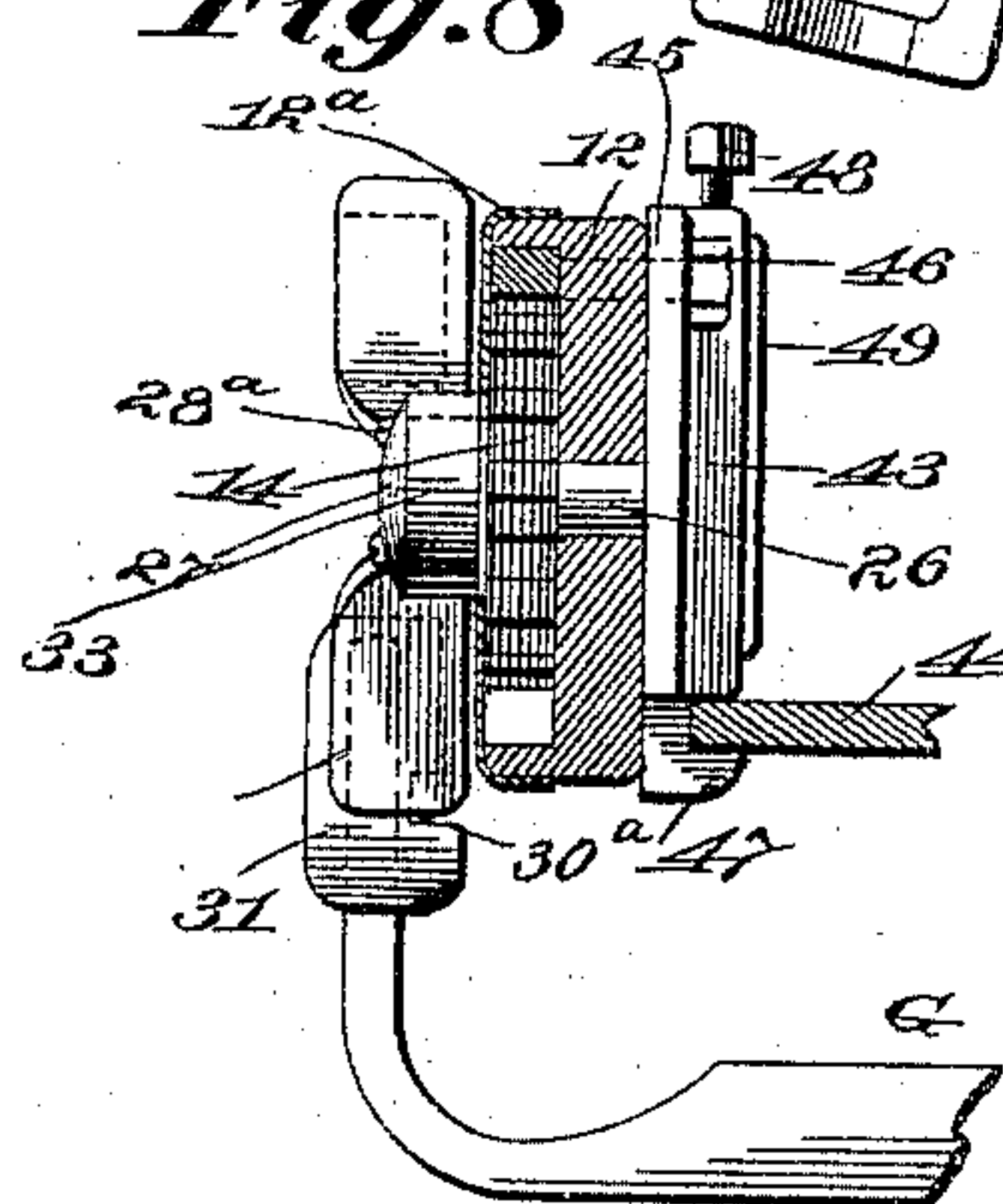


Fig. 11

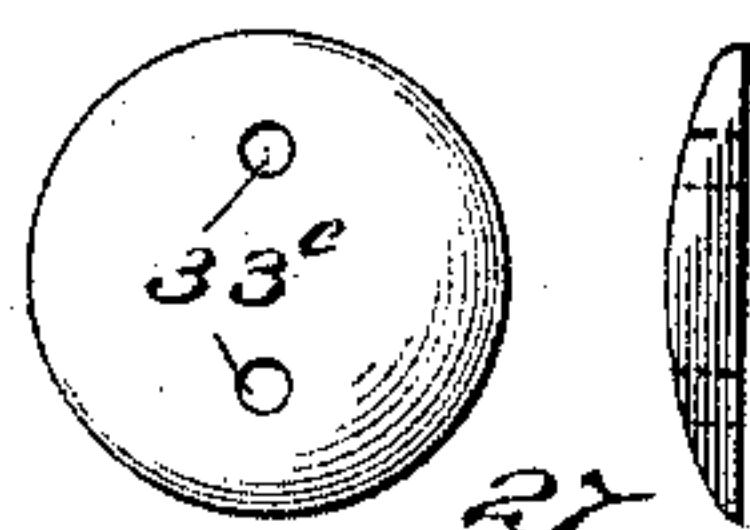


Fig. 10a

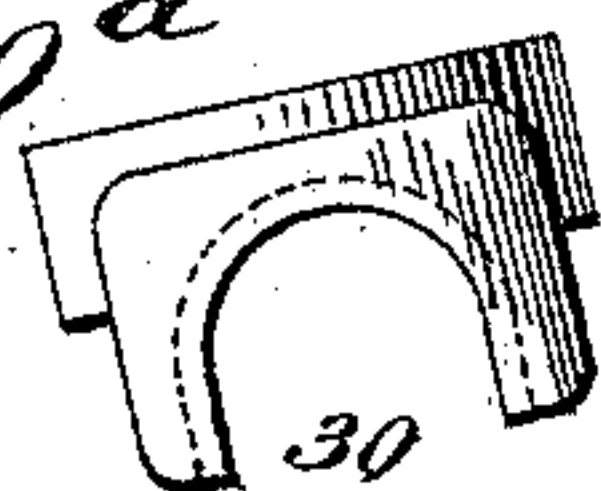


Fig. 12

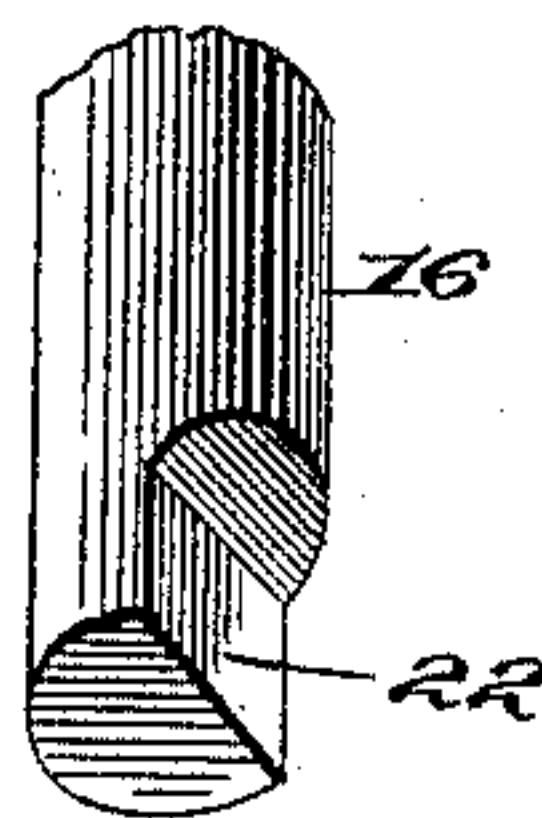


Fig. 10

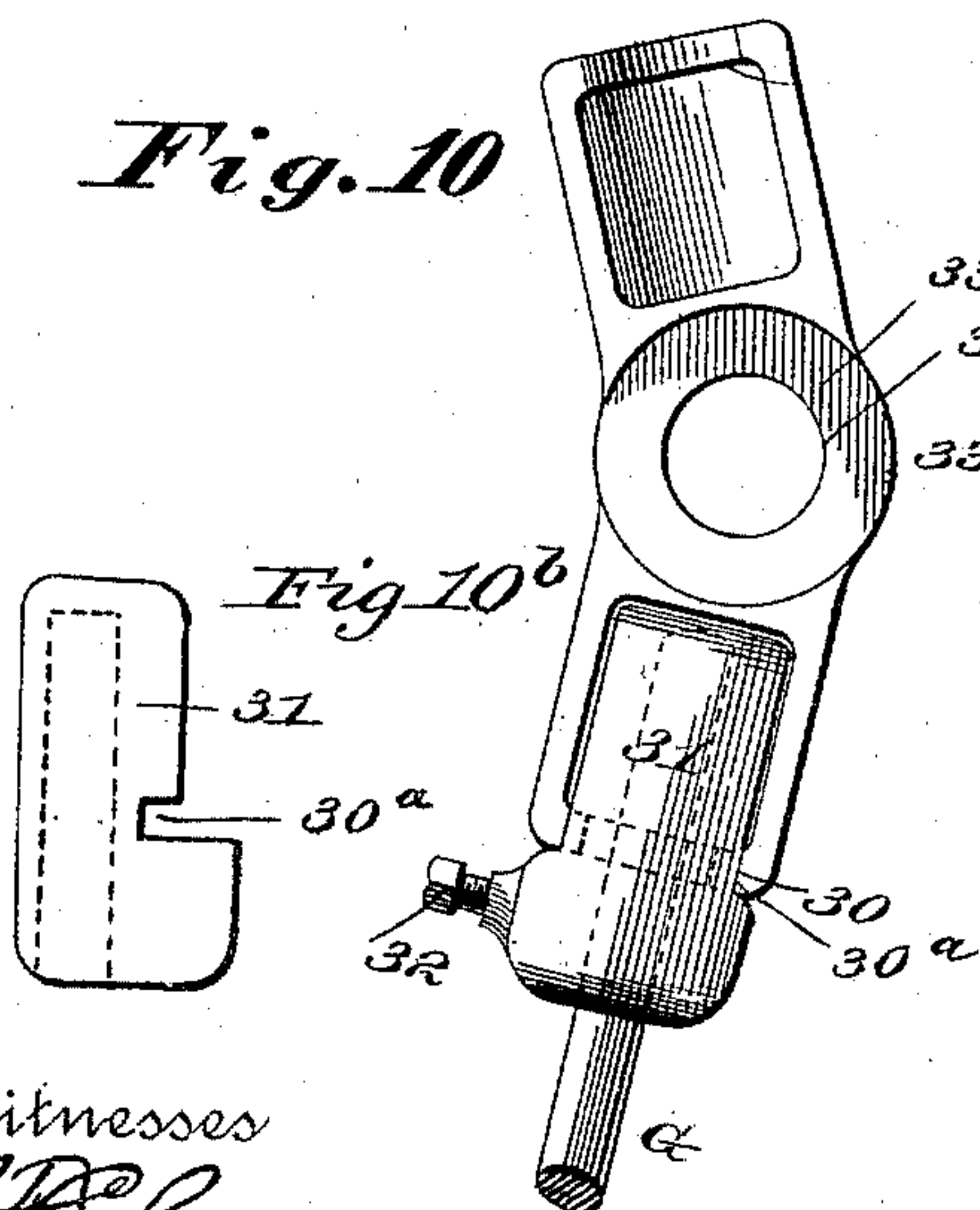
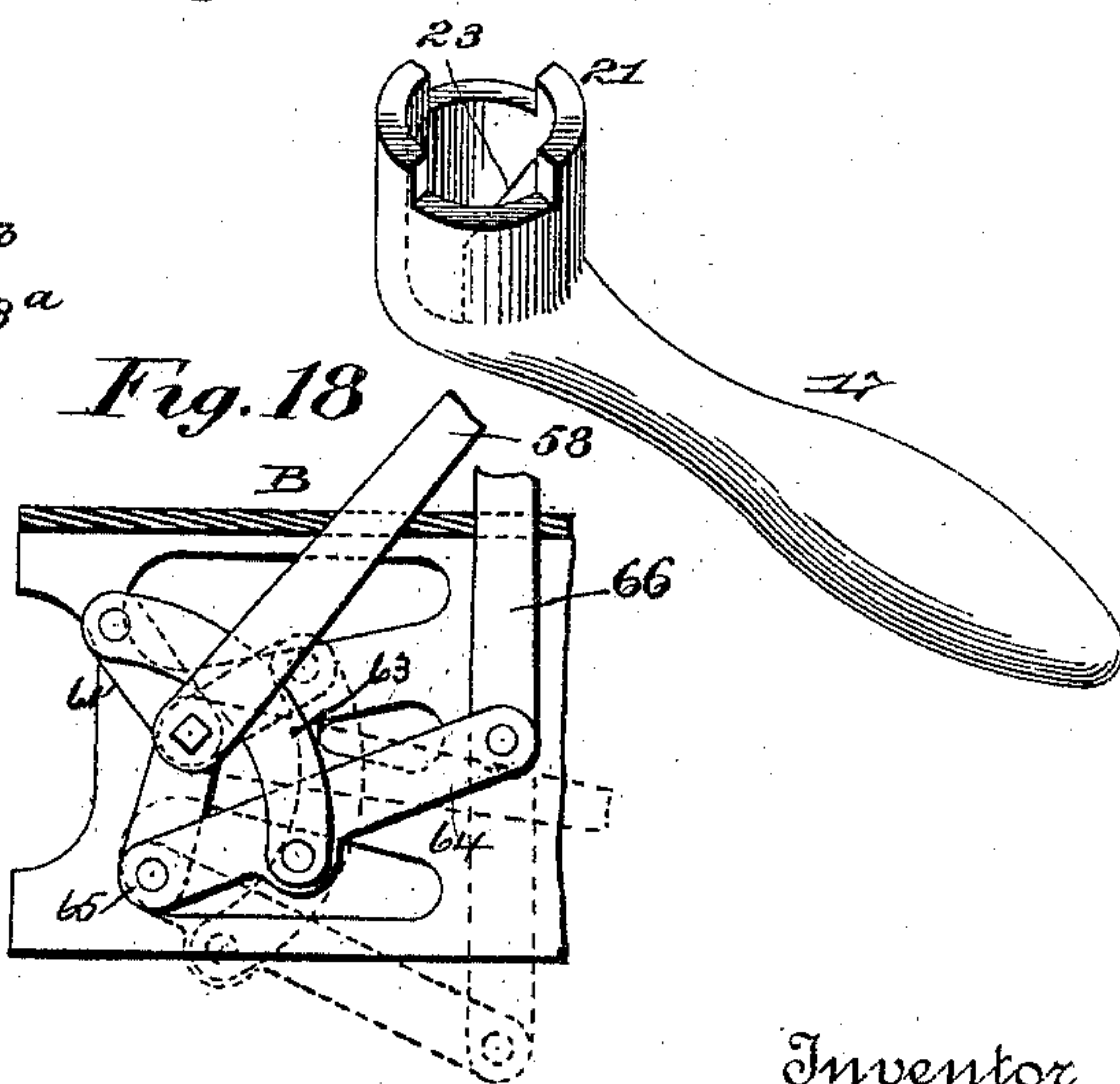


Fig. 18



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Fig. 13

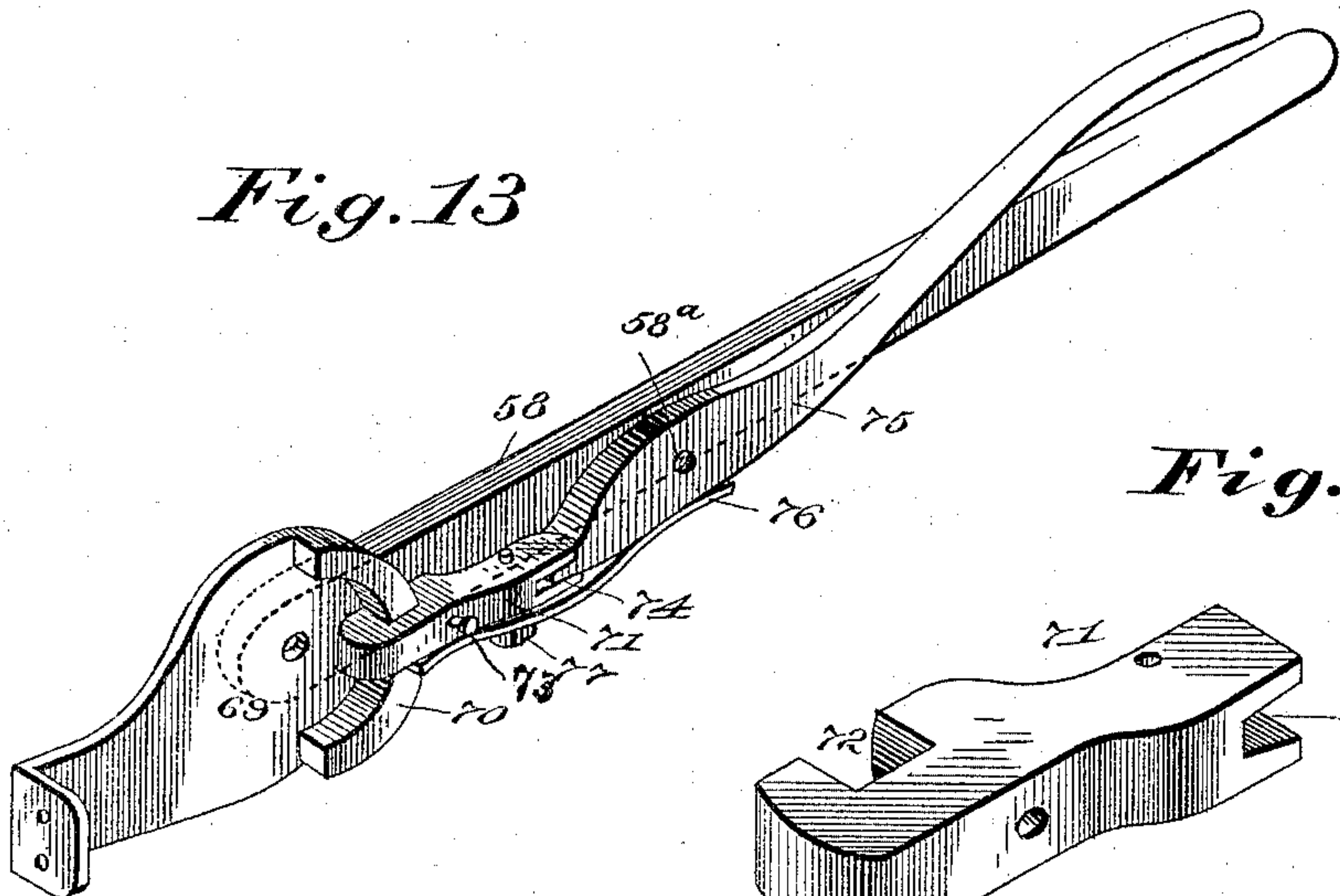


Fig. 14

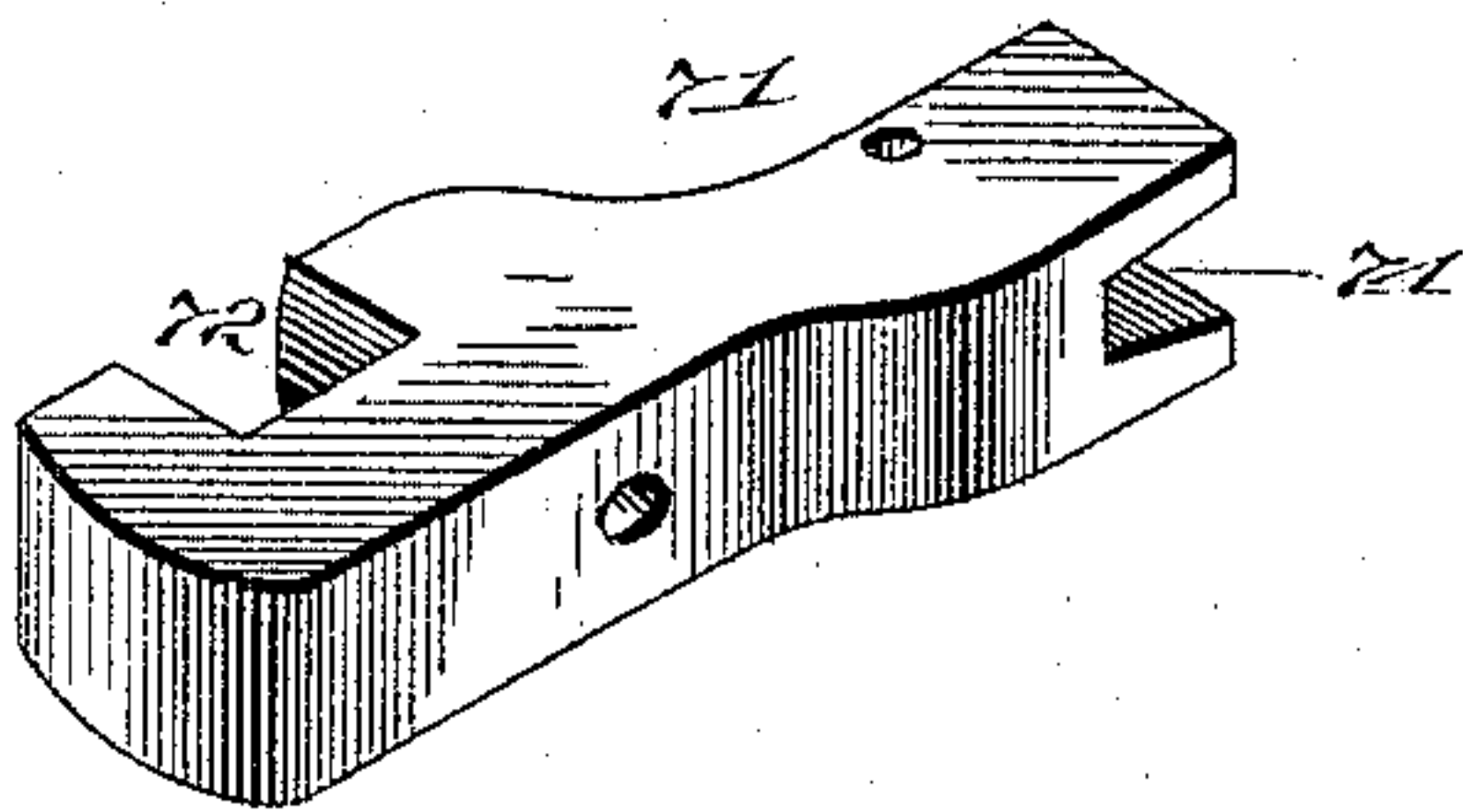


Fig. 16

Fig. 15

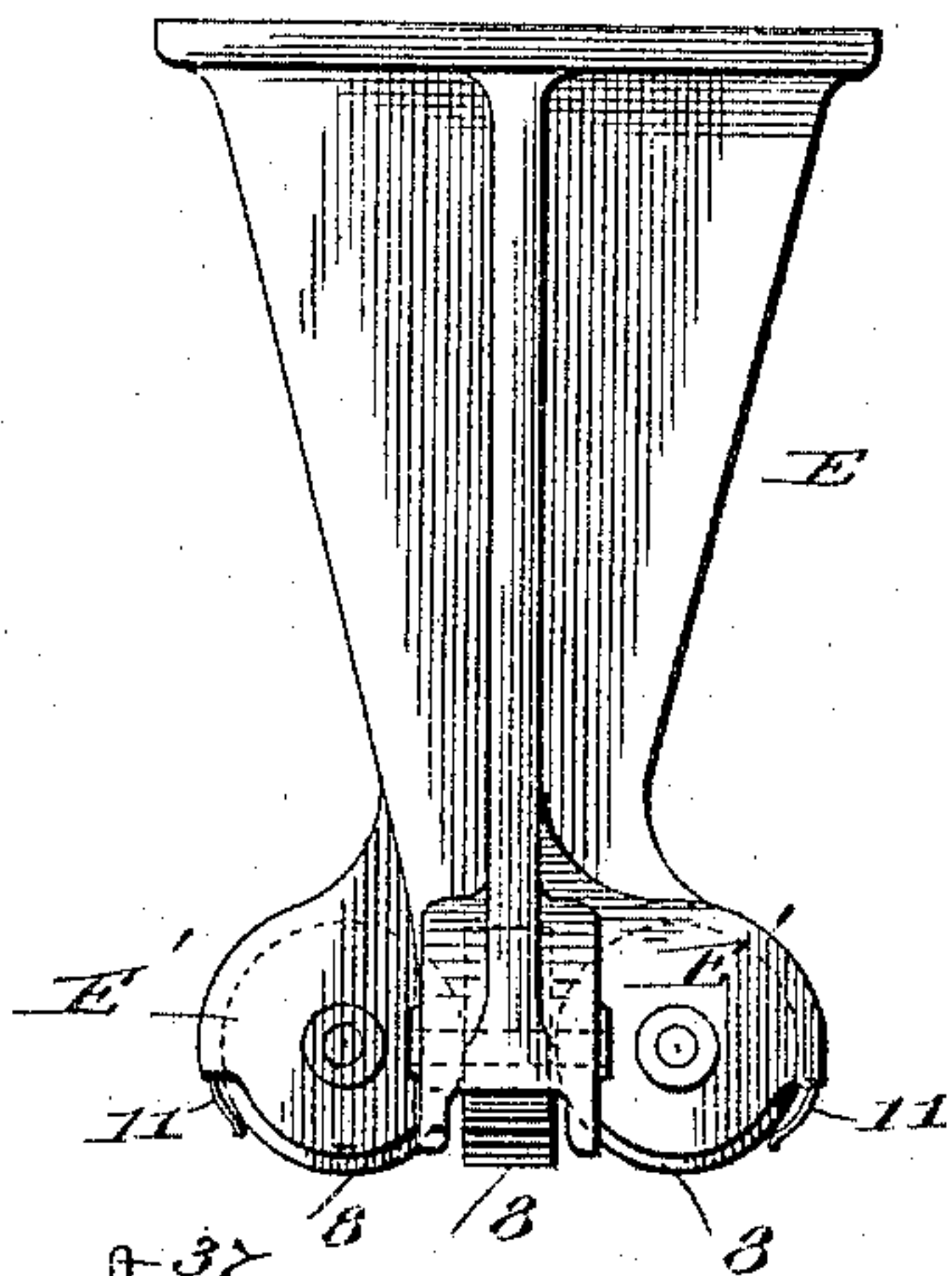
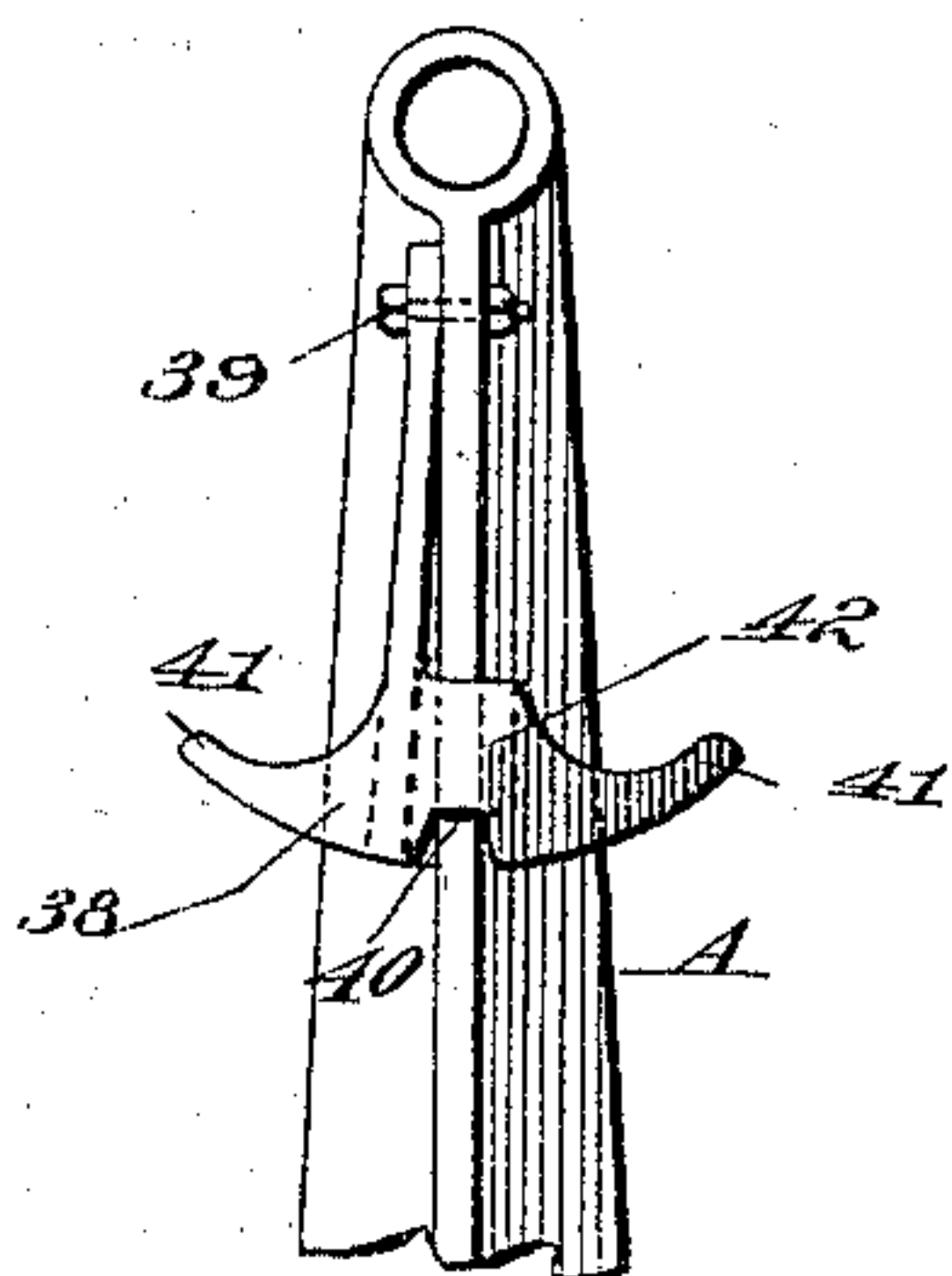
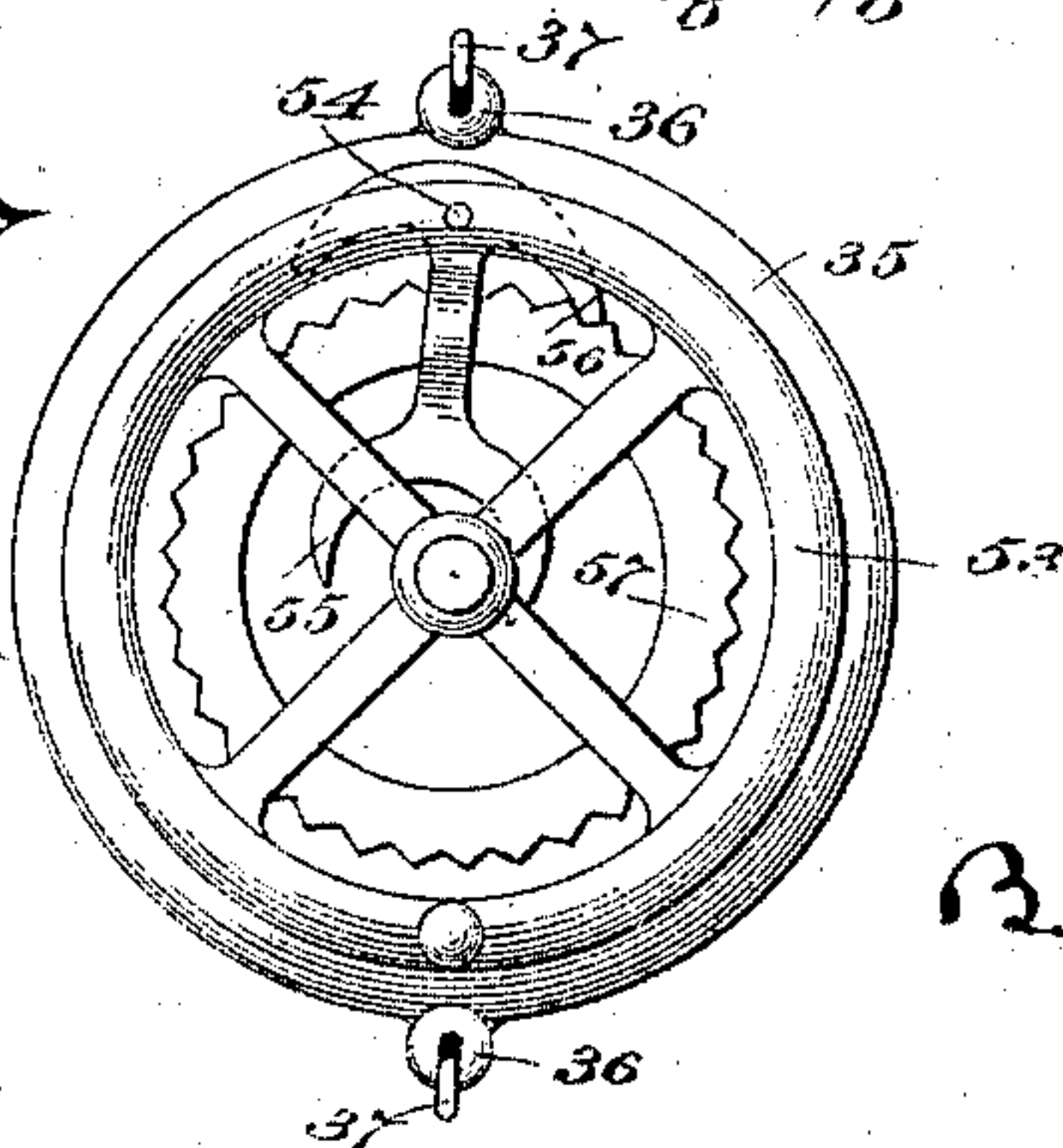


Fig. 17



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UNITED STATES PATENT OFFICE.

ABRAHAM L. TEETOR, OF INDIANAPOLIS, INDIANA.

MOLDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 495,570, dated April 18, 1893.

Application filed July 15, 1891. Serial No. 399,646. (No model.)

To all whom it may concern:

Be it known that I, ABRAHAM L. TEETOR, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Molding-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in molding apparatus and more particularly to a sand molding machine,—the object of the invention being to provide means for clamping and holding the pattern plate.

A further object is to provide means whereby the antifriction rollers on which the cross-head of the machine moves, will be protected from sand, &c.

A further object is to produce improved bails for supporting the flask while the frame which contains the same is being rotated, and to produce improved means for manipulating said bails.

A further object is to provide efficient devices for preventing the improper operation of the standard and table, during the operation of packing the flask.

With these objects in view the invention consists in certain novel features of construction and combinations and arrangements of parts as hereinafter set forth and pointed out in the claims.

In the accompanying drawings: Figure 1 is a perspective view of my improved molding machine. Fig. 2 is a view of the devices connecting the lever for manipulating the standard and table, with said standard. Fig. 3 is a view illustrating the hood which covers the rollers at the ends of the cross head. Fig. 4 is a section on the line $x-x$ of Fig. 5. Fig. 5 is a perspective view of the clamp which holds the pattern plate. Fig. 6 is a view illustrating the gearing for operating the bails. Fig. 7 is an enlarged side elevation of the bail center 33, disks 27, casing 12 and handle 17. Fig. 8 is a section through the frame at the point where the bail centers are journaled. Fig. 8^a is a sectional view showing the employment of the disk 19. Figs. 9 and 9^a are views illustrating an auxiliary disk sometimes employed for excluding dust from the pinions 14, 15.

Fig. 10 is a view of the bail center. Fig. 10^a is an end view of one of the bail centers. Fig. 10^b is a side elevation of one of the bail chucks. Fig. 11 is an illustration of the spring disks 27. Fig. 12 illustrates the arrangement of the hand lever 17 and shaft 16. Fig. 13 is a perspective view of the operating lever. Fig. 14 illustrates the clutch. Fig. 15 is a view of part of the main upright of the machine with a spring stop 38 secured to it. Fig. 16 is a separate view of the standard. Fig. 17 is a separate view of the jarring mechanism. Fig. 18 is a view of the link and lever mechanism.

A, A' represent the main uprights of the machine, connected together in proximity to their base by means of an inverted U-shaped housing or casting B,—the frame thus formed being provided with rollers or wheels C, C', which are preferably arranged one at one end and two at the other end of the machine.

Made on the inner faces of the uprights A, A', are flanges or guides 1 on which anti-friction rollers 2, carried by a cross head D, are adapted to run. Secured to and carried by the cross head D is a hood 3 provided with spring scrapers 4 and 5, which are made of brass or other suitable metal,—the scrapers 4 being adapted to rest against and keep clean the guides 1, and the scrapers 5 being adapted to bear against the anti-friction rollers 2 at the ends of the cross head. The center of the housing or casting B is provided with flanges 7 on which antifriction rollers 8 carried by brackets E carried by the cross head are adapted to run. Mounted on the top of the brackets E is a table or platform 8^a adapted to support the bottom board 9 of the flask during the filling of the flask. The bracket E is also provided with a hood E' for the rollers 8,—also scrapers 10 to act on the guides or flanges 7 and scrapers 11 to act on the wheel 2.

Mounted on the uprights A, A', is a revolvable frame F, and located at the sides of this frame are casings 12 to which are connected in proximity to the ends of the frame F, bails G, said casings 12 having covers 12^a and being adapted to carry devices whereby to manipulate the bails, which devices will be now specifically described, reference in this connection being particularly had to Figs. 6 and 7. Three pinions 13, 14, 15, are located on

each side of the machine in the casings 12, the pinions 13 being secured on each end of a shaft 16, this shaft being located transversely in the frames 12 and having secured thereto at outside of the casing, the operating handles 17, as shown in Figs. 1 and 7. Secured to one face of each pinion 14, 15, are eccentric hubs 28, for a purpose presently explained. The casings 12 inclose these gears so that the sand is effectually excluded from them, and a disk 19, Fig. 9, is sometimes used, being placed on pinions 14, 15, and secured thereto so as to revolve with the same. This disk is only required when the eccentric on the pinion is so large that its extreme side extends in line with or beyond the bottom of the teeth of the pinion, as in that case the openings through the casing through which the eccentric extends would necessarily be so large that the sand could get through by it and the pinion teeth. Formerly the handles 17, were held by set screws only, but owing to their liability of slipping this manner of attaching the handles to the shafts 16 was unsatisfactory. To avoid this defect, clutches 20 are formed on the end of the hub of pinion 13 and similar clutches 21 on handles 17 to engage therewith and on each end of the shaft 16, there is a flattened section or recess 22, Fig. 12, and a block 23 in the handle 17 to engage therewith and but one set screw 24 is used in each handle simply to retain the handle. This arrangement causes the pinions 13, 14, 15, to remain in proper relative position at all times. These pinions 13, 14, 15 are adapted to engage the teeth of a rack bar 25 which extends from end to end of the frame 12 at each side thereof. The bails G are carried by the eccentrics of said pinions 14, 15. The bail centers 33 of the bails G are each made with an opening 33^a and an annular flange 33^b surrounding this opening. A saucer shaped spring disk 27 is placed on the annular flange 33^b and over the opening 33^a, said saucer shaped spring plate being made with perforations 33^c for the accommodation of screws or pins 28^a. The screws or pins 28^a pass through the perforations in the spring plate 27, and into the eccentric hub 28 on the pinions 14, 15. By this means it will be seen that the bails G are connected with the eccentrics on the pinions by means of the frictional contact of the spring plate 27 on the annular flanges 33^b of the bail centers 33. By now operating the handle 17 all the bails will be operated simultaneously so as to impel said bails forward until they meet the resistance occasioned by their coming into contact with the bottom board 9 of the flask. By providing the pinions 14, 15 with eccentric hubs 28 and connecting the bails with these eccentric plates, it will be seen that as the bails approach the bottom of the flask their motion will be increased or quickened. The bail centers are each provided with an inwardly projecting flange or shoulder 30 adapted to engage a groove 30^a in the bail chuck 31, which

latter is provided with a set screw 32 adapted to secure the bail in the chuck 31. By thus constructing the bails they may be readily placed in position and adjusted.

The journal of the frame F is provided with a wheel 35, which is furnished with two handles 36 located diametrically opposite each other, and pivotally connected to said handles are latches 37 which are alternately forced by springs (not shown) into engagement with a keeper or stop 38 on the upright A. This keeper or stop 38 is preferably made of metal having a spring action and is secured to the upright by a bolt 39. The keeper or stop 38 is provided with a recess 40 at its lower end and with two laterally projecting guards 41 at either side of said recess upon which the inner end of the latches in the handles 36 of the hand wheel 35 stop to retain the revolving frame F in proper position or level. It has been found in practice that the employment of a rigid stop was not practical on account of its stopping the revolving frame, carrying the pattern, too suddenly, so that the mold was not unfrequently injured by the abrupt stoppage. The stop 38 is provided with a lug 42 projecting inwardly by the side of the rib of the upright and adapted to be pressed against said rib by the spring section of said keeper 38 with a pressure sufficient to keep the revolving frame sufficiently rigid during the process of molding, it being necessary that there should be a certain initial pressure or strain in said spring to keep the stop from swaying at such time.

Carried by the revoluble frame F at each side thereof are clamps 43 adapted to receive and hold the pattern plate 44. These clamps being all identical in construction, a description of one will suffice for all. The casing 43 of this clamp is secured to the frame by screws 46 so that a vertical adjustment of the pattern plate may be made to accommodate the difference of cope and drag flasks as will be often necessary as some patterns will extend far out from the plate on one side and but a little way on the opposite side of the plate,—that is, the pattern may be entirely in the drag and little or no depth in the cope, so that these clamps may be set up or down from the center line of the machine to accommodate such differences and as seen in Fig. 8, the screw 46 is placed at one edge of the frame so that if the clamp is removed entirely and turned bodily over, its jaws at 47 are thrown still farther from the center of the machine. The adjustable jaw 47 is secured and adjusted by means of screw 48 passing through a dog 49 and bearing on the inclined shoulder 50, the teeth 52 of the dog engaging with the reversed teeth 51 on the inner face of the casing 43,—thus the jaw 47 may be placed against the pattern plate of whatever thickness as shown in dotted lines, Fig. 4, is necessary, and the dog brought into engagement with the teeth in said jaw and the screw turned against shoulder 50, the in-

clination of which causes the dog 49 to be forced into engagement with said jaw and retain it firmly.

A wheel 53, is loosely mounted on one journal of the revoluble frame F. It has pivotally connected to its rim at 54 an anchor-shaped double cam lever, its middle arm reaching to the center of the wheel and terminating at its free end in a fork 55, the two arms of which reach, preferably, to opposite sides of the hub of wheel 35. This double cam lever has its two lateral arms of the same size and shape, each forming a pallet, 56, adapted to follow closely the contour of the cam wheel 57, which is preferably corrugated on its periphery. Thus it will be seen that when the wheel 53 is rotated on its axis, carrying with it the double cam lever, the wheel 57 remains stationary, being in this case secured to arms of wheel 35 said lever is oscillated rapidly upon its axis, causing the prongs 55 to strike sharply from either side against the hub of wheel 35, jarring the journal of the frame F, and the pattern, and loosening it in the sand.

A lever 58 is secured at one end of a short transverse shaft 59, on which are mounted contracting springs 60, and an arm 61, to which is movably attached at 62, a curved link 63, which is attached to a lever 64. This lever 64 is pivoted to the casting B at its outer end and has connected to its inner end at 65, a link 66 which is connected to plate 68, which may be secured to or be integral with the cross head D. Secured to the frame of the machine is a sector 69 having a curved laterally projecting flange 70, smooth and equal in size so that a hardened steel grip piece 71 (Fig. 14) having a clamping or biting surface 72, may act equally at all times or at any point. The grip or pawl 71 is pivotally connected to the lever 58 by means of a pin 73 and is provided in its upper end with a V-shaped recess 74 for the reception of the similarly shaped lower or forward end of a lever 75, which latter is pivotally connected to the lever 58 by means of a pin 58^a. A spring 76 is secured at a point between its ends to the pawl or grip 71 by means of an adjusting screw 77, said spring bearing at one end against the pawl 71 and at the other end bears against the lever 75, thus tending to cause the pawl 71 to bite against the flange 70. From this construction and arrangement of parts it is clear that when the lever 75 is grasped by the hand of the operator the pawl or grip 71 will be released from its biting contact with the flange 70, so that the lever 58 can be manipulated to raise or lower the table. When lever 58 is released the spring 76, held and adjusted by a screw 77, bears on under side of said pawl and lever 75 at points so as to bring this lever back to normal position and causes the pawl to pinch on the semi-circular flange 70 and securely lock the table against any farther downward movement and the greater the strain downward brought by

the weight of the flask on the table 8 the harder does the frictional pawl pinch said flange. The use of this stop or holding apparatus is necessary because in the process of drawing the bails on the uppermost flask when and whereby the lower flask is released there is an occasional slight giving down of the table which is very apt to injure the mold as there has been so far in the process no jarring of the pattern by the jarring mechanism. Again sometimes a very heavy mold is produced owing to slender and deep patterns and if the springs 60 were set up strong enough to support such flask the table might and would not unlikely be automatically elevated at any improper time.

The machine operates as follows: One of the latches 37 is brought into engagement with the stop 38, that the revolving frame and pattern plate may assume a fixed horizontal position. Now suppose that there is no flask on the machine and that the bails G are in a reversed position. A flask is placed in position on the pattern plate 44. The flask is then filled with sand and tamped or rammed in the usual manner and a board 9 placed thereon, and the bails G drawn, the table being at its lowest position. The latch 37 is then released from the catch 38 and the revolving plate turned upside down, when the latch 37 in the opposite handle will be brought into engagement with the catch 38 and the table elevated by lever 58, through the intervening mechanism, until the table bears firmly against the board 9, beneath and under the flask. Another flask matching the one now beneath is set upon the plate. The second flask is filled with sand, tamped, covered with another board 9 and the bails drawn, at the same time being withdrawn as before from the flask beneath. Now to withdraw the lower flask from the pattern, a few rapid turns are given in either direction to the wheel 53, which is pivoted to the double cam lever, which is rapidly oscillated through its engagement with the cam 57, and being adapted to strike sharply against the hub of the wheel 35 sets up a series of rapid vibrations, and the strokes coming as they do from all sides toward the axis of the revolving frame a general tremor permeates this entire section of the machine, freeing the sand from the pattern, and after this tremor is set up and before it ceases, the table is lowered with the flask.

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

1. In a molding machine, the combination with a revolving frame, and a pattern holder, of sectional bails pivotally connected to said frame and means for adjusting one section in relation to the other, substantially as set forth.
2. In a molding machine, the combination with a revoluble frame and a pattern plate, of a shaft mounted in the frame, pinions journaled in the frame, sectional bails and fric-

tional devices connecting said pinions and bails to cause them to turn together and means for transmitting motion to said pinions, substantially as set forth.

5 3. In a molding machine, the combination with a revoluble frame and a pattern plate, of casings in said frame, pinions mounted in said casings, eccentrics carried by said pinions, bails mounted loosely on the eccentrics of said
10 pinions, a rack bar in said casings with which said pinions are adapted to mesh, a spring disk secured to the eccentrics and adapted to bear on the bails, and means for reciprocating the rack bars and thereby operating said
15 pinions simultaneously to manipulate the bails, substantially as set forth.

4. In a molding machine, the combination with a revoluble frame and a pattern plate, of casings carried by said frame, pinions mounted in said casings, sectional bails carried by the eccentrics on the pinions, means for adjusting one section of the bails in relation to the other a common rack bar adapted to mesh with said pinions, another pinion mounted in
20 the casings and a handle secured to the shaft of the last mentioned pinion, said pinion being also adapted to mesh with said rack bar, substantially as set forth.

5. In a molding machine, the combination
30 with a revoluble frame, and a pattern plate, of pinions carried by said frame, bails carried by said pinions, a common rack bar with which said pinions are adapted to mesh, another pinion adapted to mesh with the rack bar, a clutch
35 carried by said last mentioned pinion, a handle mounted on the shaft of said last mentioned pinion, a clutch carried by said handle and adapted to mesh with the clutch on the pinion and a set screw for securing said handle, and shaft together, substantially as set
40 forth.

6. In a molding machine, the combination with a frame, and a pattern holder, of a movable cross head, antifriction rollers carried
45 by said cross head and adapted to ride on flanges on the frame of the machine and a hood adapted to cover said rollers, substantially as set forth.

7. In a molding machine, the combination
50 with a frame, and a pattern holder, of a cross head, antifriction rollers carried by said cross head and adapted to run on flanges on the frame of the machine, a hood for said rollers and scrapers for said rollers, substantially as
55 set forth.

8. In a molding machine, the combination with the main frame, of a cross head, antifriction rollers carried at the ends of said cross head and adapted to ride on guides or
60 flanges on the main frame, a hood for said rollers, scrapers adapted to scrape the rollers, and scrapers adapted to scrape the guides or flanges, substantially as set forth.

9. In a molding machine, the combination
65 with the main frame and a cross head, of brackets projecting from said cross head, roll-

ers carried by said brackets guides on the frame to receive said rollers, a hood for said rollers and scrapers for said rollers, substantially as set forth.

10. In a molding machine, the combination with a revoluble frame, of a wheel carried by the journal of said frame, latches carried by said wheel, and a yielding stop for said latches carried by the main frame, substantially as
75 set forth.

11. In a molding machine, the combination with a revoluble frame, of a wheel carried by the axle of said frame, latches carried by said wheel, and a yielding stop secured to the main
80 frame, said stop being provided with lateral arms and a notch with which said latches are adapted to engage, substantially as set forth.

12. In a molding machine, the combination with a pattern plate holder, a movable table,
85 a shaft, a spring secured at one end to the frame of the machine and at the other end to the shaft and a connection between said shaft and the movable table, of a lever secured to said shaft, a segment, a pivoted clutch or
90 pawl adapted to engage said segment, a spring for maintaining said pivoted clutch or pawl in frictional engagement with the segment, and a finger bar having a pivotal engagement with the clutch or pawl for manipulating it,
95 substantially as set forth.

13. In a molding machine, the combination with a frame and a pattern plate, of a sliding plate having teeth, a flange projecting from said sliding plate, a frame for supporting the
100 sliding plate, a dog having teeth to engage the teeth of the sliding plate and a screw passing through said dog and adapted to bear on the frame, substantially as and for the purpose set forth.

14. In a molding machine, the combination with a frame and a pattern plate, of a clamp for said plate, said clamp consisting of a frame having a beveled lower edge, a toothed
110 sliding plate having a jaw or flange at one edge thereof, a dog having teeth to mesh with the teeth of said plate, and a screw adapted to pass through said dog and bear at its end against the inclined or beveled edge of the frame, substantially as set forth.

15. In a molding machine, the combination with a pair of double-acting adjustable bails of a series of pinions, eccentrics carried on said pinions, the central sections of said bails journaled on said eccentrics, clutches adapted
120 to engage loosely in each end of said central section and set screws adapted to adjustably hold the transverse sections of the bails in said clutches, substantially as set forth.

In testimony whereof I have signed this
125 specification in the presence of two subscribing witnesses.

ABRAHAM L. TEETOR.

Witnesses:

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WILBER F. CORNELIUS.