

No. 668,263.

J. W. MURRAY & C. W. FIELD.

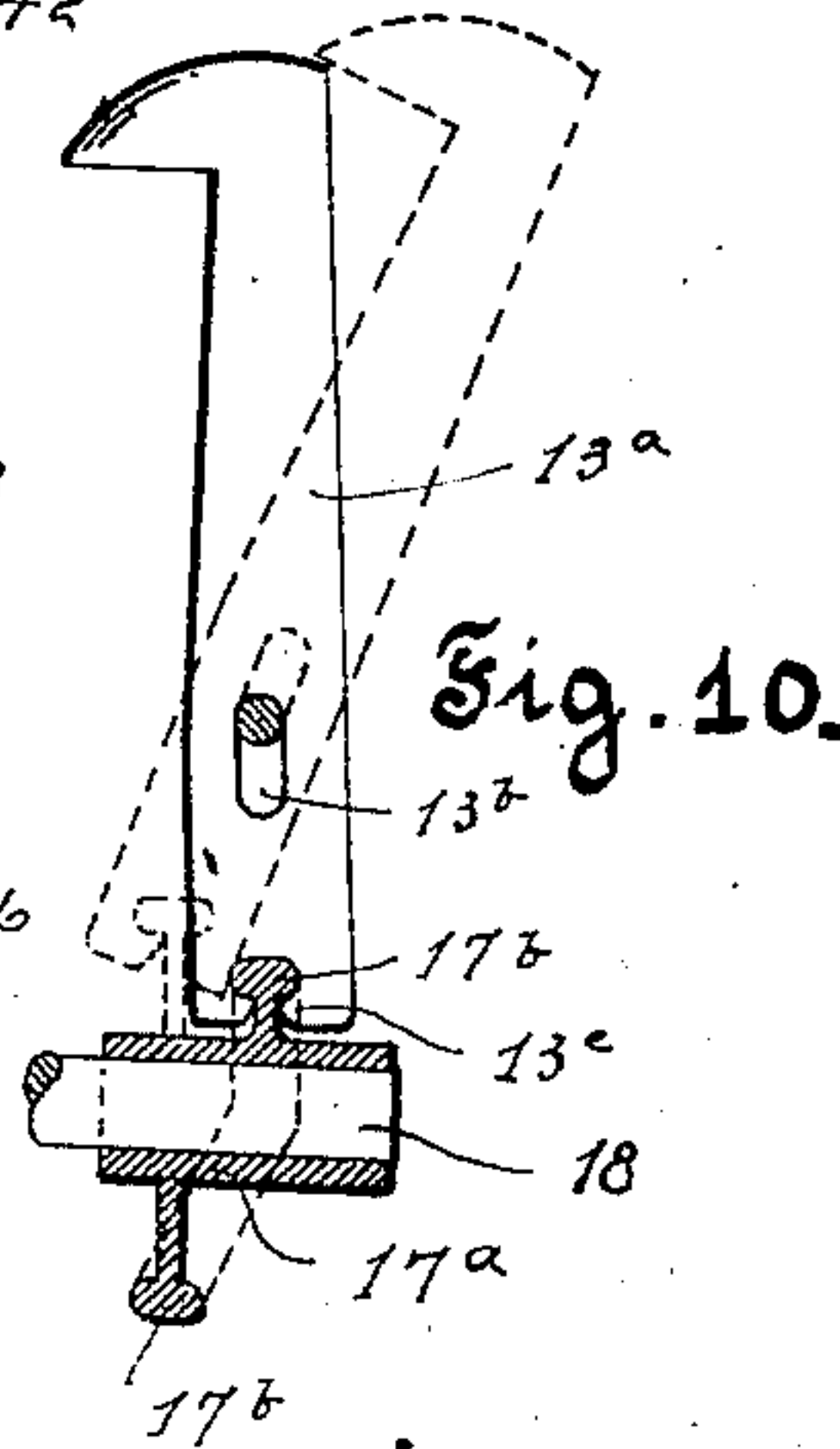
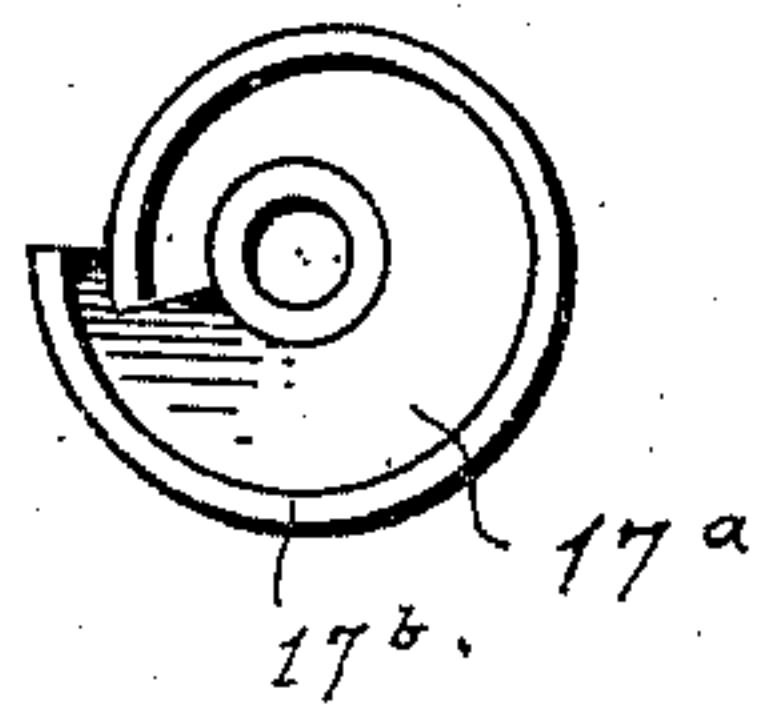
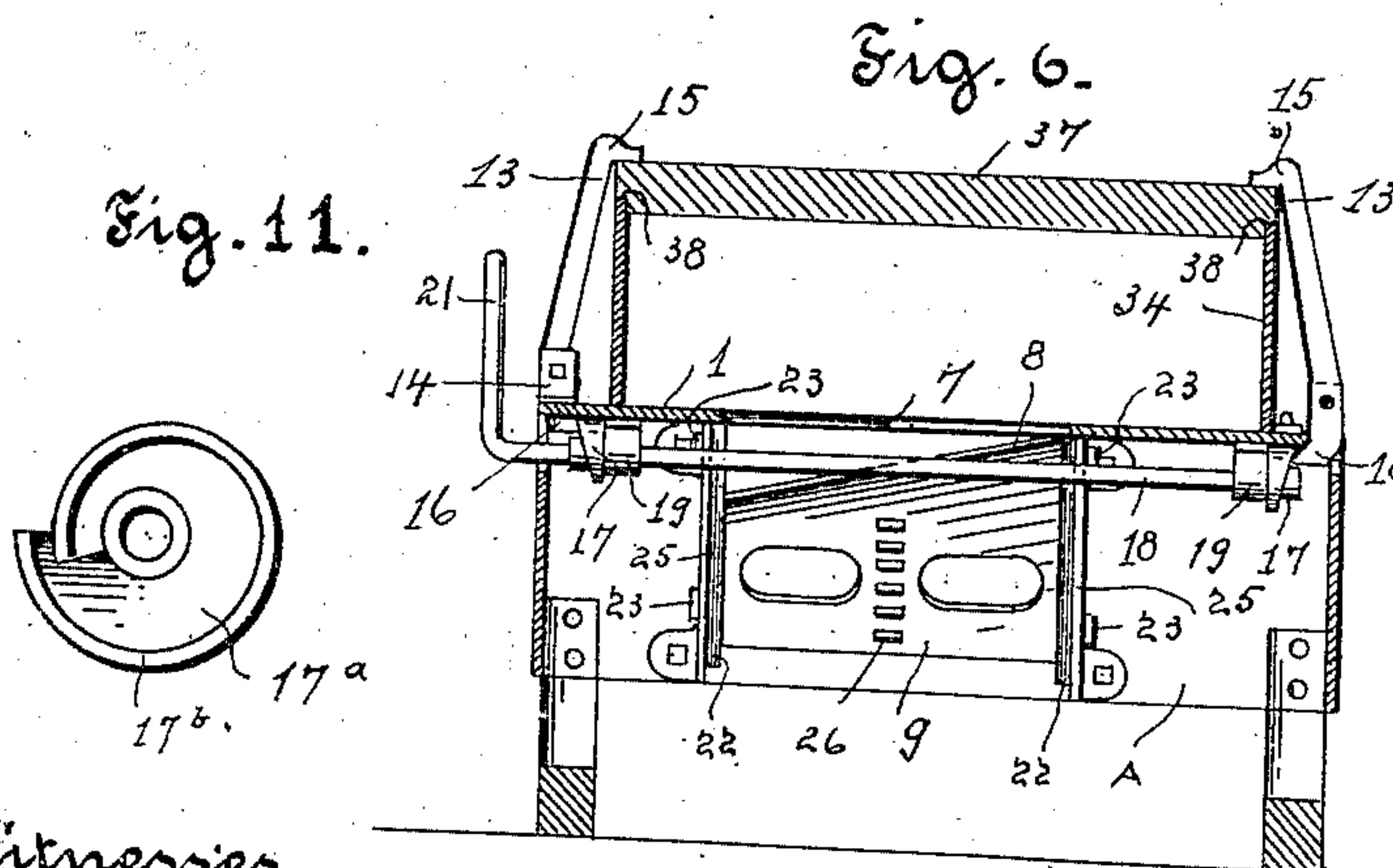
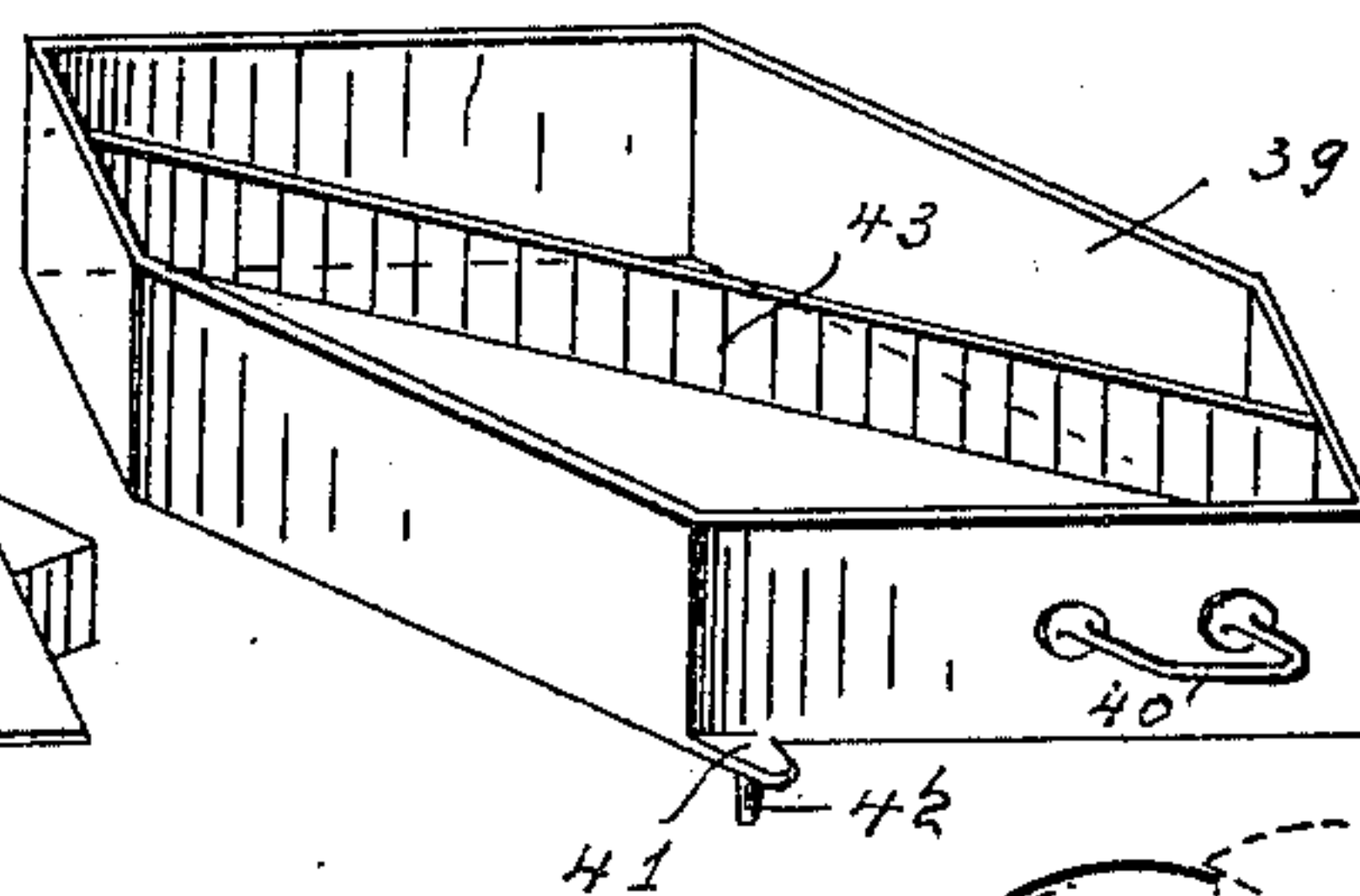
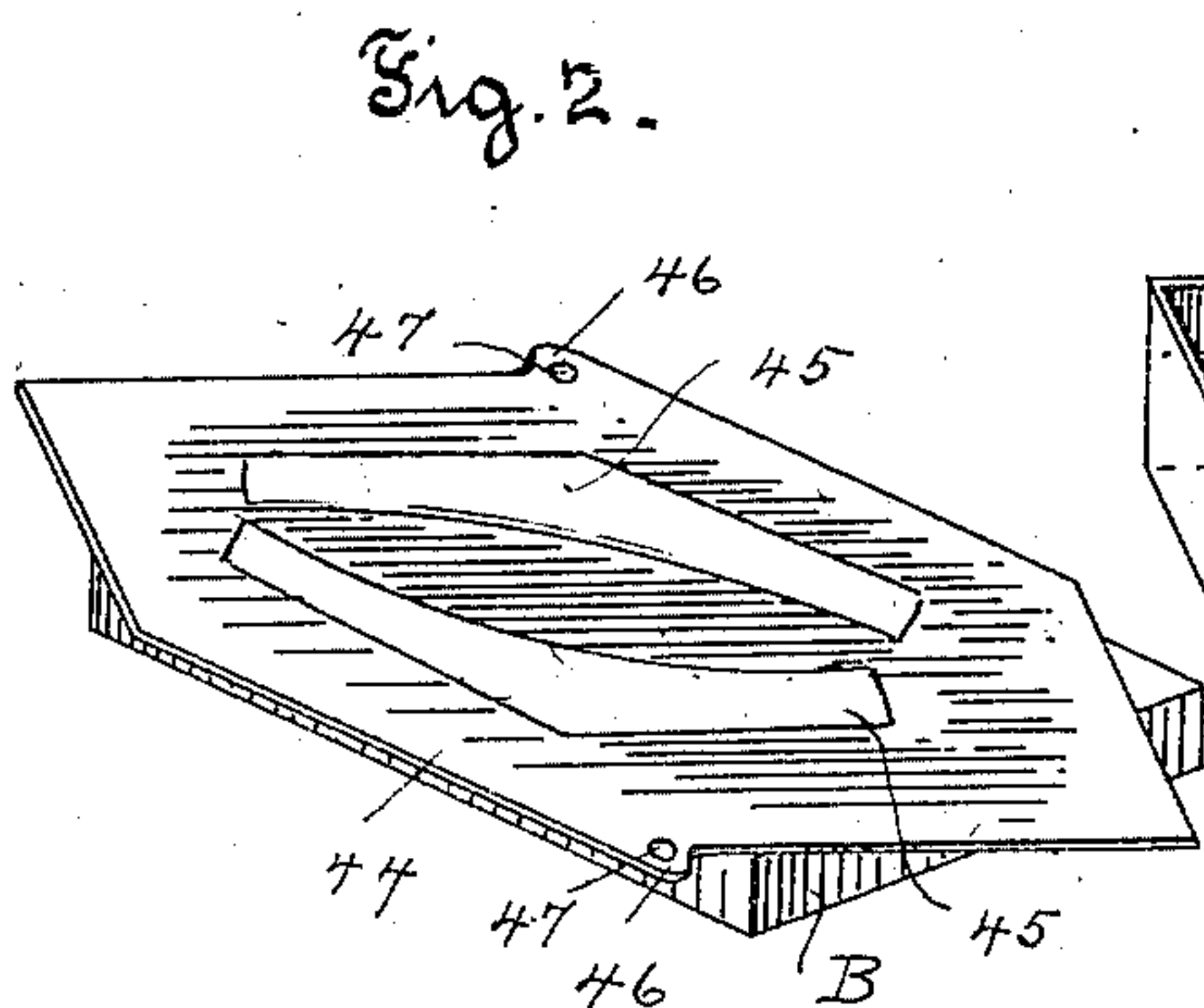
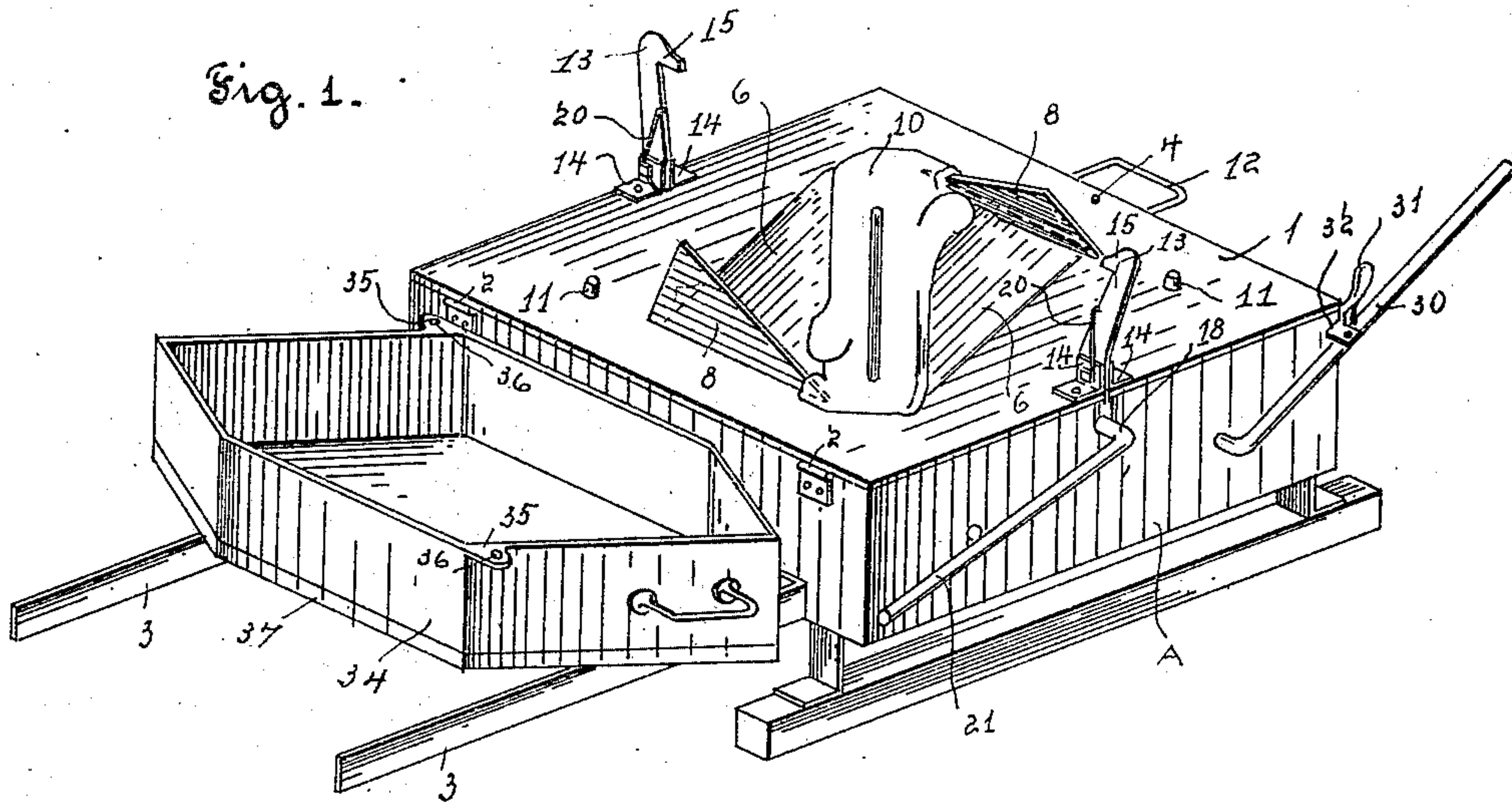
Patented Feb. 19, 1901.

MOLDING MACHINE.

(Application filed Sept. 15, 1900.)

(No Model.)

2 Sheets—Sheet 1.



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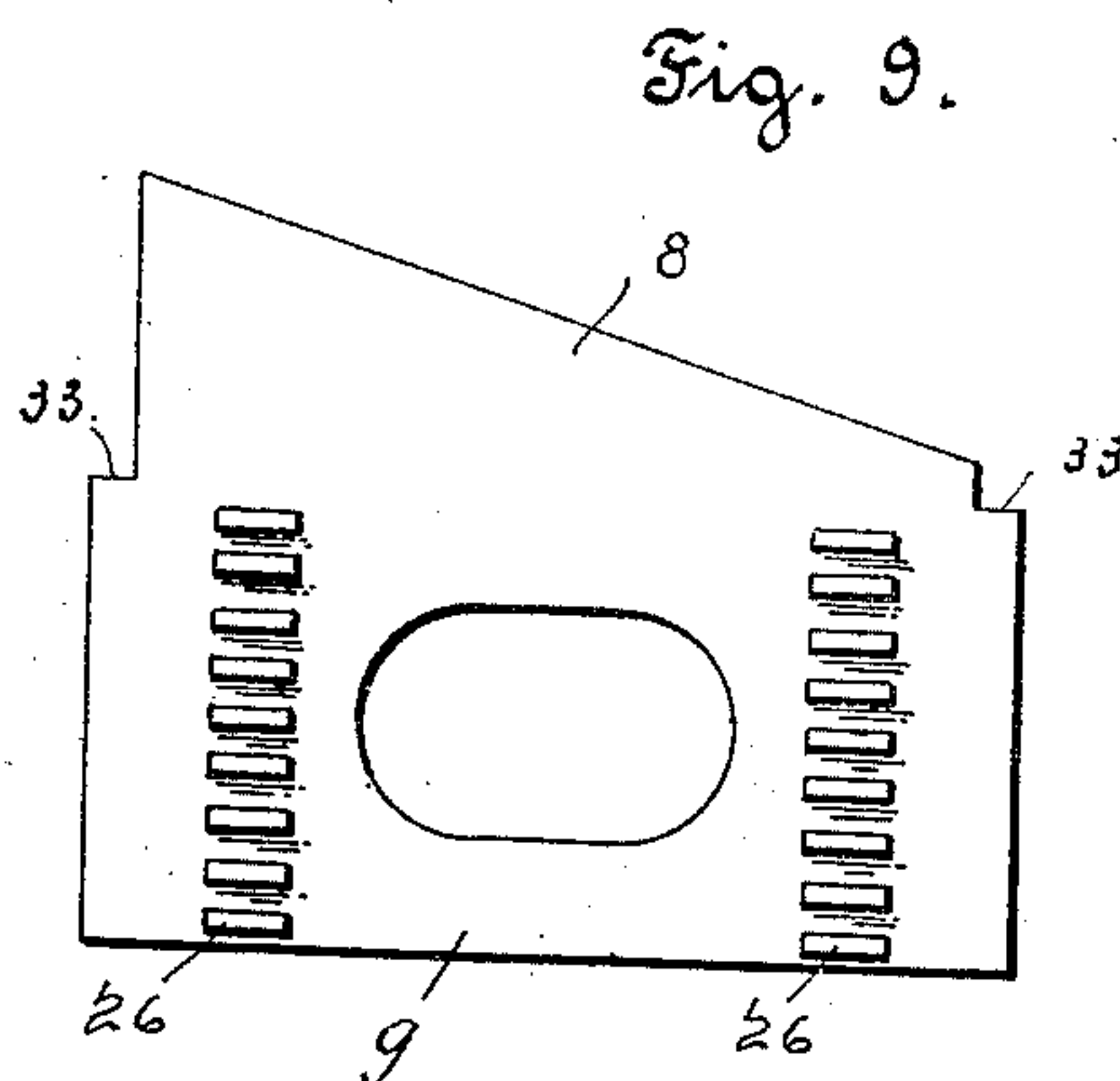
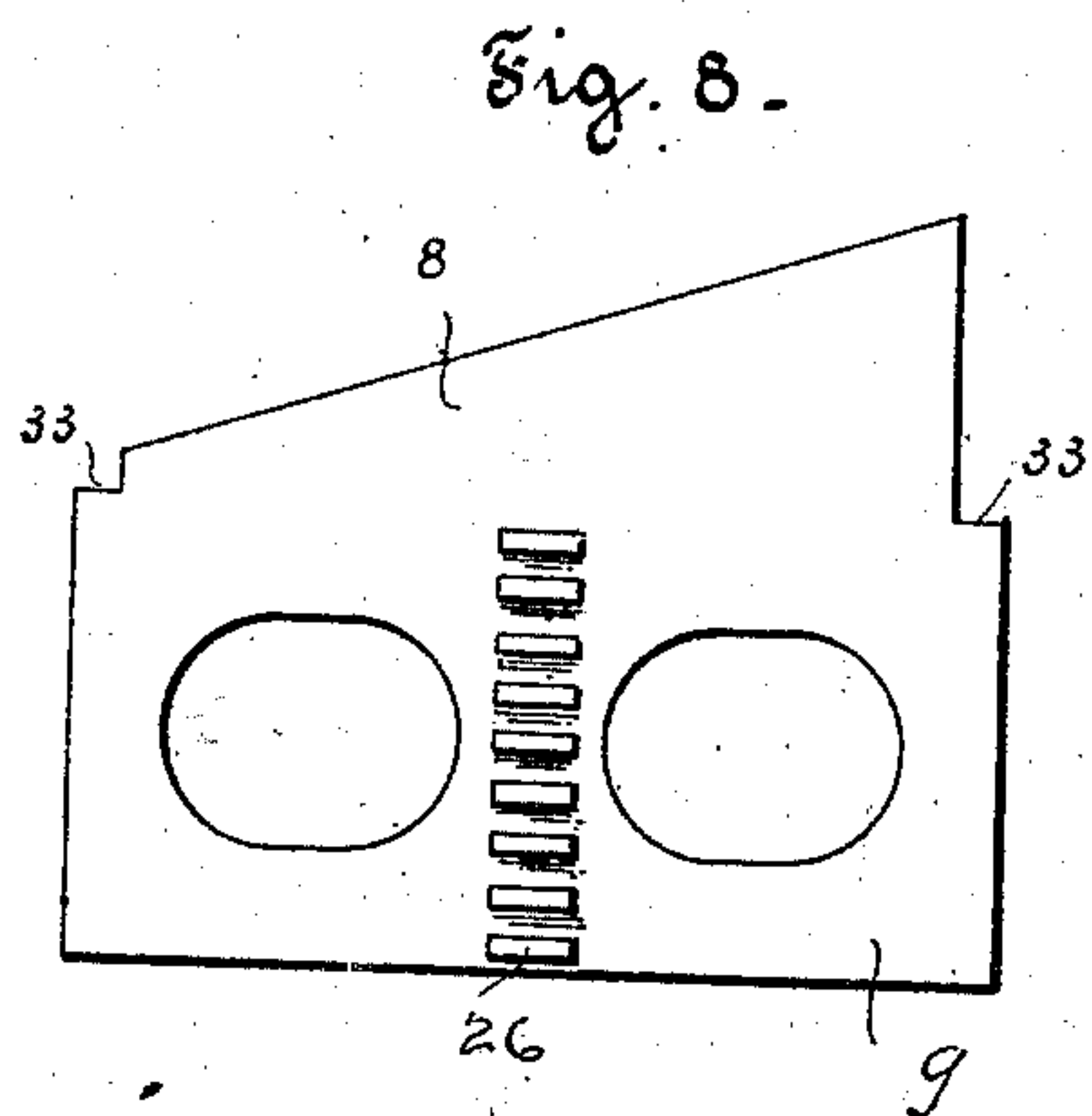
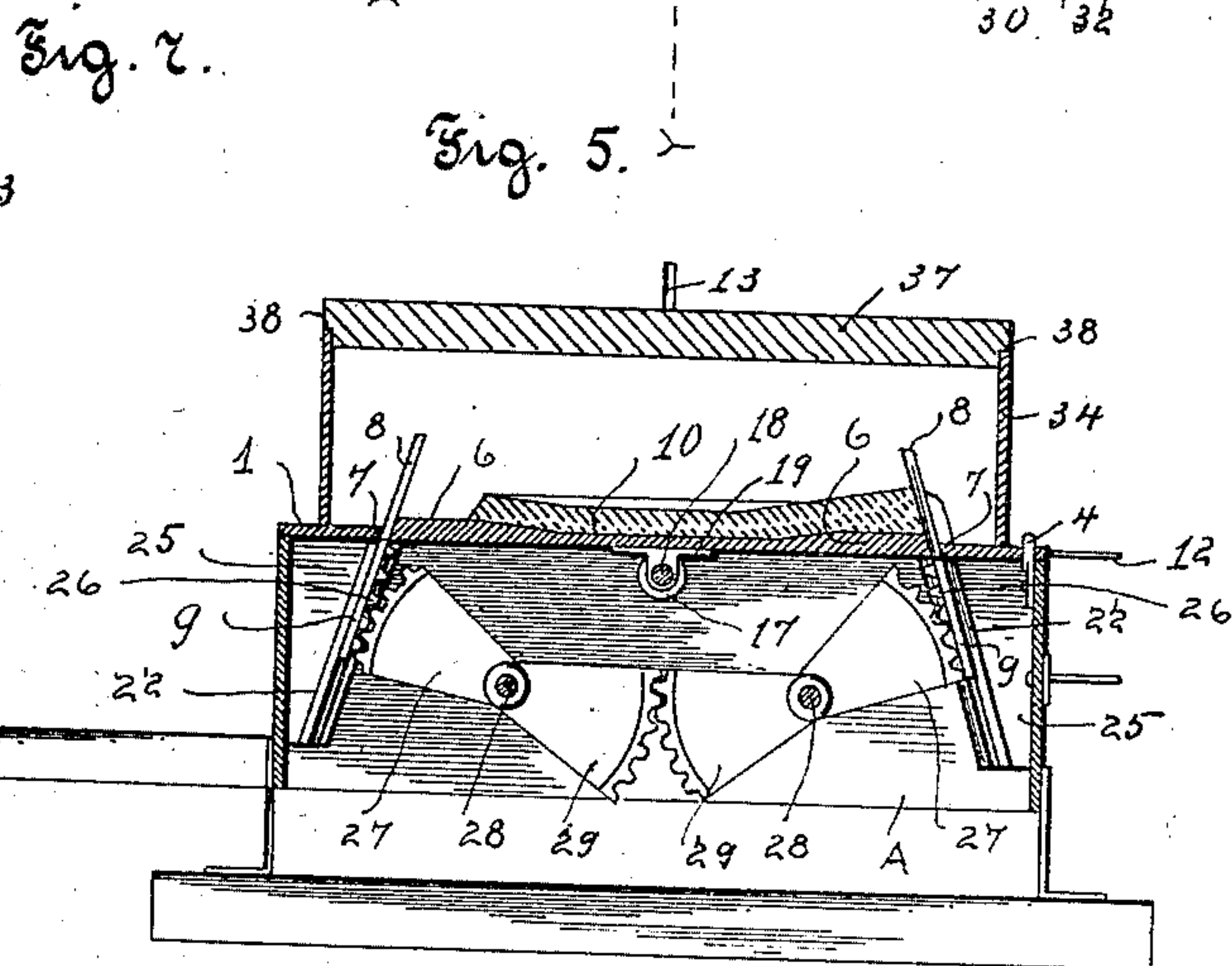
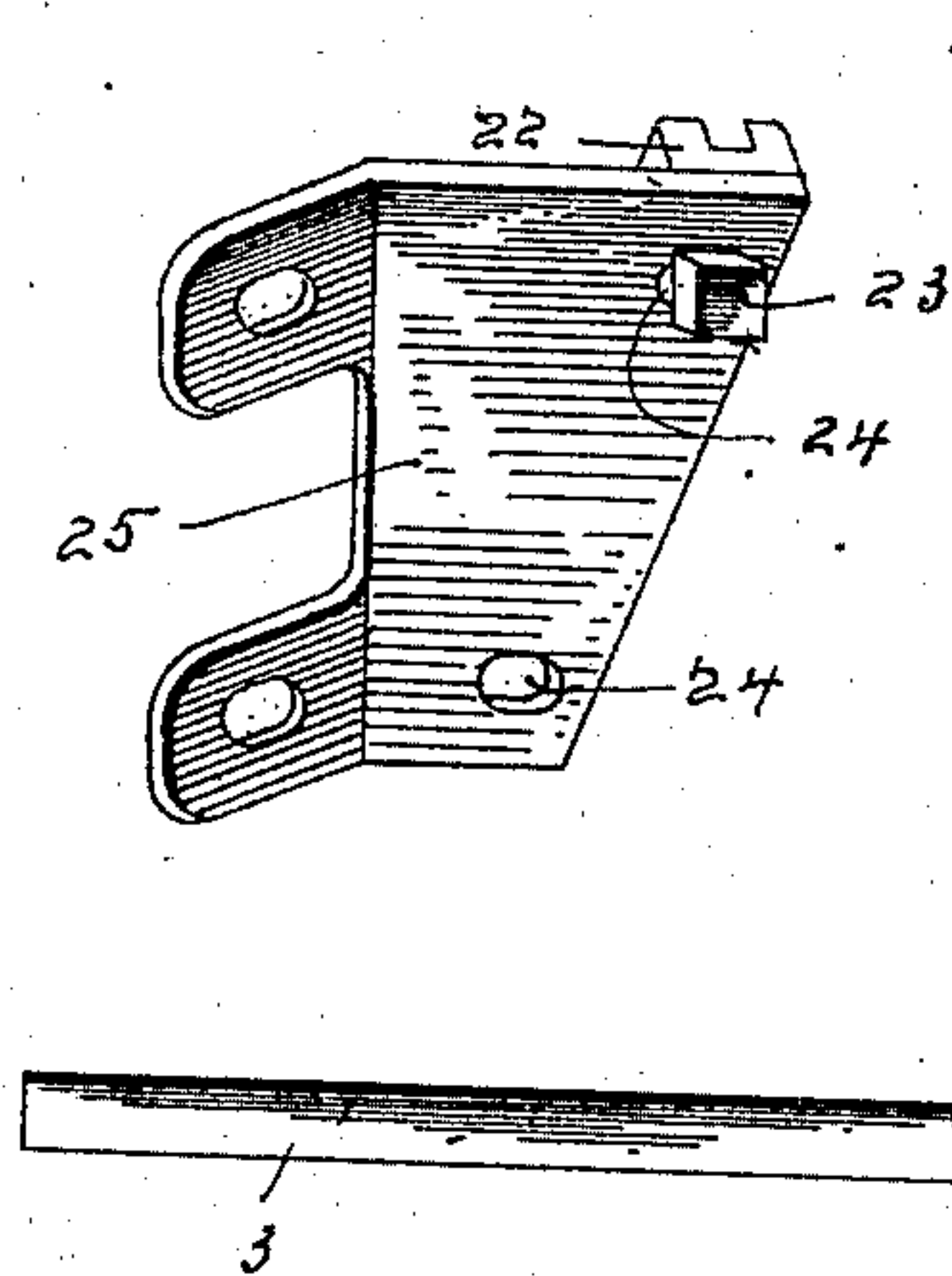
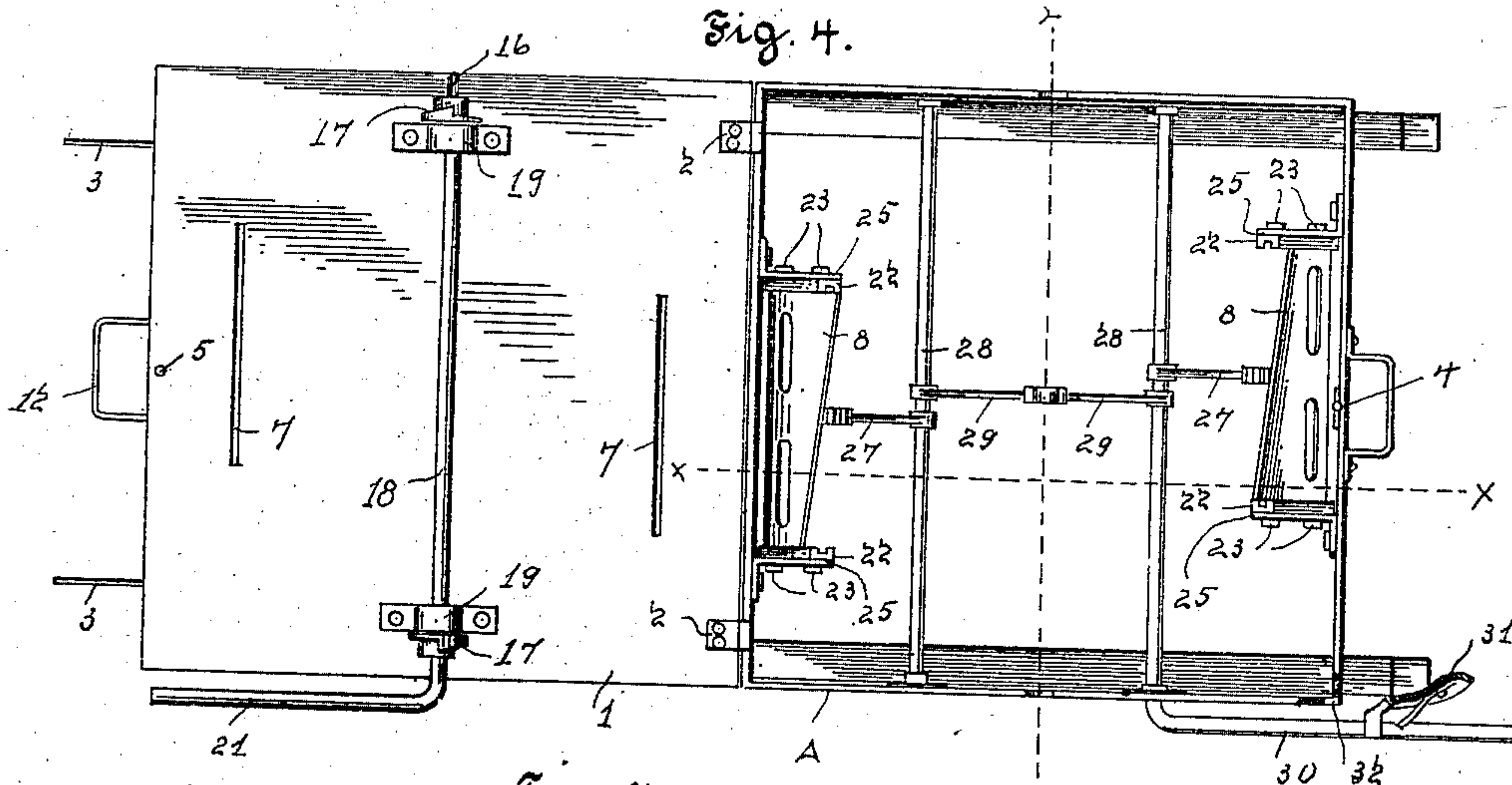
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2 Sheets—Sheet 2.



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# UNITED STATES PATENT OFFICE

JOHN W. MURRAY AND CYRUS W. FIELD, OF TOLEDO, OHIO.

## MOLDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 668,263, dated February 19, 1901

Application filed September 15, 1900. Serial No. 30,122. (No model.)

*To all whom it may concern:*

Be it known that we, JOHN W. MURRAY and CYRUS W. FIELD, citizens of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented a new and useful Improvement in Molding-Machines, of which the following is a specification.

Our invention relates to improvements in molding-machines for making molds for casting plowshares.

In Letters Patent No. 656,362 issued to us, dated August 21, 1900, we have shown and described a machine of the kind in which the portions of the patterns necessary to be withdrawn from the sand before the main body portion can be drawn therefrom are integral with plates set in ways or guide-bars, along which they may be mechanically projected through slots in the pattern or stripping plate, into proper position to complete the patterns and readily withdrawn from the impacted sand without injury to the impressions of the patterns. Without departing from this principle of our said invention, the objects of our present invention are, first, to provide ready means of adjustment of the guide-bars to the slots; second, to provide improved means of projecting and withdrawing the movable portions of the patterns along their guide-bars; third, to provide ready means of securely clamping the flask to the pattern-plate while being inverted; fourth, to utilize the draw-plates as a means for locking the pattern-plate to the top of the casing, and finally to facilitate the operation and increase the efficiency of the machine. We accomplish these objects as hereinafter set forth, and illustrated in the accompanying drawings, wherein—

Figure 1 is an isometric view of our invention, showing a stripping-plate with duplicate patterns for the top side of a plowshare with the movable portions of the patterns set and locked in position and with the flask-clamps open and the lower flask-section in position as deposited on the flask-supports by turning the stripping-plate on its hinges. Fig. 2 is a similar view of a stripping-plate having duplicate patterns in corresponding position to those of the stripping-plate of Fig. 1 of the bottom side of a plowshare. Fig. 3 is a similar view of a flask-section for the strip-

ping-plate shown in Fig. 2. Fig. 4 is a plan view of the machine with the stripping-plate reversed on its hinges. Fig. 5 is a cross-section through line *xx* of Fig. 4 with the stripping-plate in position on top of the casing and the flask-section in position on the stripping-plate and showing side elevation of toothed segments in position to set the movable portions of the patterns. Fig. 6 is a similar view through line *yy* of Fig. 4, showing side elevation of flask-clamps in position clamping the flask to the stripping-plate and of its operating mechanism and also showing a movable pattern-plate withdrawn. Fig. 7 is an isometric view of a bracket for supporting the guide-bars for the movable pattern-plates, showing means for adjusting the guide-bars. Fig. 8 shows an elevation of a movable pattern-plate detached from the ways. Fig. 9 shows a modified form of the same, and Figs. 10 and 11 show modified forms of clamp mechanism.

Similar letters and numerals refer to similar parts throughout the several views.

A is the machine-casing, having a stripping-plate 1, which is hinged to the top of the casing by hinges 2 2 and forms a top cover therefor.

3 3 are parallel horizontal bars secured to and projecting from the side of the casing to which the stripping-plate 1 is hinged and form supports to receive the flask.

4 is a dowel-pin in the rim of the casing opposite the hinges, and 5 is an orifice in the edge of the stripping-plate 1 to receive the pin and accurately seat the plate on the casing.

Stripping-plate 1 is a solid metal plate having molded or formed thereon in inverse position duplicate patterns 6 of the top portion of a plowshare, which are provided with inclined rectangular slots 7, cut through the stripping-plate in the edge of the patterns, through which are projected from the reverse side of the stripping-plate the pattern portions 8, formed on draw-plates 9, the pattern portions 8 being adapted to form the inclined projections of the patterns necessary to be withdrawn from the sand before the body portion of the patterns can be drawn therefrom.

For the purpose hereinafter stated patterns



6 are so disposed on stripping-plate 1 as to bring slots 7 parallel with each other and with the edge of the plate that is hinged to the casing.

5 10 is a chill-plate imposed between the two patterns 6 and resting upon the share and point portions thereof.

Plate 1 is also provided with oppositely-disposed dowel-pins 11, a handle 12, and flask-clamps 13, pivoted near their lower ends to brackets 14, oppositely secured to the top side of the plate. The clamps are provided with heads 15 at their top ends, adapted to engage the top of the flask, and lower end portions 16, engaging cams 17 on a horizontal shaft 18, journaled in hangers 19, secured to the under side of stripping-plate 1. Clamps 13 are also provided with springs 20, tending to hold the clamps normally open, as in Fig.

20 1. One end of shaft 18 is extended beyond the edge of plate 1 through an open slot in casing A and is provided with a lever 21. The cams 17 are inversely mounted on opposite ends of shaft 18, so that when the lever 21 is in position, as shown in Fig. 1, the clamps 13 are in the open position shown in the same figure. When this lever is thrown over to the right, the cams 17 force the lower end portions 16 of the clamps simultaneously outward and the heads 15 inward until they are in contact with the flask, as shown in Fig. 6.

In Figs. 10 and 11 are shown a modified form of clamp mechanism, wherein involute cams 17<sup>a</sup>, having beaded threads 17<sup>b</sup>, are substituted for the cams 17, and clamps 13<sup>a</sup>, having elongated pivot-slots 13<sup>b</sup> and lower end portions 13<sup>c</sup>, incut to receive the beaded thread 17<sup>b</sup>, are substituted for the clamp 13 and its spring 20. The initial movements of the respective clamps produced by their respective cams are the same; but after the clamp 13<sup>a</sup> has reached the position shown in full lines in Fig. 10 from the position shown in dotted lines in the last half of the movement of lever 21 the cam 17<sup>a</sup> draws the clamp 13<sup>a</sup> vertically downward, by which means the clamp is not only utilized to hold the flask in position on the stripping-plate, as hereinafter described, but also to pack the sand therein by compressing the cover, thus accomplishing both purposes by the same means in one operation.

Draw-plates 9 are adapted to move along inclined guide-bars 22, which are adjustably secured in alinement with slots 7 by bolts 23 through elongated orifices 24 in brackets 25, which are secured to casing A. Draw-plates 9 are also provided with racks 26, having teeth adapted to intermesh with the toothed segments 27, secured on the horizontal shafts 28, journaled in the sides of casing A parallel with the plates 9 and geared together by toothed segments 29, one of the shafts 28 being provided with a lever 30 as a means of simultaneously rocking the shafts 28 in opposite directions, and thereby by means of segments 27 and racks 26 simultaneously pro-

jecting or withdrawing pattern portions 8 through slots 7 in plate 1. Lever 30 is provided with a spring-latch 31, adapted when the lever has been raised far enough to project the pattern portions 8 to their required positions in the patterns 6 to engage a notch or ledge 32 in or secured to the casing and lock the lever, and thereby lock the pattern portions 8 in such position, plates 9 being provided with shoulders 33, adapted to abut the stripping-plate 1 and limit the upward movement of the plates 9 and the throw of the lever 30.

34 is the lower section of the flask and is provided with ears 35, projecting oppositely from the top of the section, having orifices 36, adapted to receive the dowel-pins 11 of stripping-plate 1 when the section is inverted thereon and is also provided with a bottom 37, having a ledge 38, adapted to seat on the rim of the flask.

39 is the upper section of the flask and is provided with handles 40, projecting opposite from the sides and with ears 41 projecting opposite from the bottom edge, corresponding in position with the ears 35 of the lower section. The ears 41 are provided with dowel-pins 42, adapted to fit into the orifices 36 of the ears of the lower flask-section when the sections are joined. Section 39 is preferably provided with the bridge 43, adapted to frictionally support the central portion of the sand when packed in the flask.

Upon a suitable base B is secured a stripping-plate 44, having formed thereon duplicate patterns 45 of the bottom side of a plow-share in position to correspond with the patterns of stripping-plate 1. Stripping-plate 44 is provided with ears 46 in position to correspond with ears 41 of the upper flask-section, and ears 46 are provided with orifices 47, adapted to receive the dowel-pins 42 of ears 41 when the flask-section 39 is in proper position on the stripping-plate 44. Stripping-plate 44 is also provided with suitable gate-pins and orifices therefor at proper places in the patterns. (Not shown.)

When the stripping-plate 1 is in position, as shown in Fig. 1, with the chill-plate 10 imposed on patterns 6 and with the lever 30 locked in position to project the pattern portions 8 and the lever 21 in position to open the clamps, the lower section 34 of a flask with the bottom 37 removed is inverted and seated on the stripping-plate 1, with the dowel-pins 11 in orifices 36. The flask-section is then filled with sand, and any surplus being first struck off level with the edge of the flask the bottom 37 is placed in position and forced by pressure until its ledge 38 is seated on the rim of the flask, thereby packing the sand. Lever 21 is then thrown from its position, as shown in Fig. 1, a half-revolution until cams 17 compress the heads of clamps 13 tightly down upon the flask, as shown in Fig. 6. Thus secured the spring-latch 31 is released and lever 30 is moved downward until the



pattern portions 8 are fully withdrawn through the slots 7. Stripping-plate 1 is then turned over on its hinges by handle 12 until the bottom of flask-section 34 rests on the bars 3. Lever 21 is then reversed to open the clamp and stripping-plate 1 is again lifted by handle 12, thereby withdrawing the patterns 6 from the sand, and the plate turned back on top of casing A in position to receive another flask, and the lower section of the flask is left supported on the bars 3 in position to receive the upper section. The upper flask-section 39 being set in position, as described, on stripping-plate 44, with gate-pins in position, the operation of filling and packing the sand therein may be conducted simultaneously with that of the lower section, and after removing the gate-pins the upper flask-section may then be lifted by handles 40 and without turning set on top of the lower flask-section with the dowel-pins 42 in the orifices 36, in which position the mold is complete, and the sections may then be clamped together and the flask removed for filling.

By having the guide-bars 22 made adjustable imperfect alinement of the draw-plates with the slots may be readily corrected, and the same machine may be used with different stripping and draw plates having slight variations of patterns required for special plows.

Plates 9 may be provided with a central rack, as in Fig. 8, or with end racks, as in Fig. 9, and the shafts 28 with segments intermeshing with them. The latter form is preferred as better insuring equal movement of the ends of the plates and preventing binding in the guide-bars.

It is apparent that by so locating the patterns on the stripping-plate as to bring the slots 7 parallel with its hinged edge the pattern portions 8 of plates 9 when projected will operate as locks for the stripping-plate and render a special lock to prevent premature or accidental movement of the stripping-plate unnecessary.

It is apparent also that by means of the improvements herein shown and described the operation of the machine is greatly facilitated and its efficiency increased.

Having thus fully described our invention and its operation, what we claim to be new, and desire to secure by Letters Patent, is—

1. In a molding-machine, the combination of a stripping-plate mounted on a support and having patterns formed thereon, inclined slots cut through the stripping-plate, inclined guide-bars secured to the support, means to adjust the inclination of the guide-bars to the inclination of the slots, draw-plates movable along the guide-bars and having pattern portions adapted to be projected through the slots and form inclined projections of the patterns, and mechanical means to move the plates along the guide-bars, to project their pattern portions and set them in position to

complete the patterns, and to withdraw them in the plane of their inclination, substantially as shown and described.

2. In a molding-machine, the combination of a base, a stripping-plate supported on the base, having a pattern formed thereon, provided with an inclined slot cut through the stripping-plate, brackets secured to the base having elongated bolt-holes, guide-bars adjustably secured to the brackets by bolts through the bolt-holes in the brackets, in alinement with the plane of the slots in the stripping-plate, and a draw-plate adapted to move along the guide-bars, and provided with a pattern portion adapted to be projected through the slot in the stripping-plate and set in the pattern, and to be withdrawn therefrom by moving the draw-plate along the guide-bars, substantially as shown and described and for the purpose specified.

3. In a molding-machine, the combination of a casing, a stripping-plate hinged to the casing and forming a cover therefor having patterns formed thereon, inclined slots cut through the stripping-plate, guide-bars adjustably secured to the casing in alinement with the inclination of the slots, draw-plates provided with racks and movable along the guide-bars, having pattern portions adapted to be projected through the slots to form inclined projections of the patterns, shafts journaled in the sides of the casing, toothed segments secured in the shafts, gearing the shafts to each other and to the racks of the draw-plates, a lever secured to one shaft, whereby the shafts may be rocked to project or withdraw the pattern portions through the slots, a flask-section adapted to be seated on the stripping-plate, a cover for the flask-section, clamps attached to the stripping-plate, adapted to secure the flask on its seat while the stripping-plate is turned over on its hinges to invert the flask, and mechanical means attached to the stripping-plate, adapted to move the clamps into or out of engagement with the flask, substantially as shown and described.

4. In a molding-machine, the combination of a casing, a stripping-plate hinged to the casing and forming a cover therefor, having patterns formed thereon provided with inclined slots cut through the stripping-plate, guide-bars secured to the casing and adjusted to the inclination of the slots, draw-plates supported by and movable along the guide-bars, having pattern portions adapted to be projected through the slots and set in the patterns, mechanical means adapted to move the draw-plates and project their pattern portions through the slots and set them in the patterns, and to withdraw them therefrom, a flask-section adapted to be seated on the stripping-plate, a cover for the flask-section, a shaft journaled pendently from the stripping-plate, cams inversely mounted on the shaft, clamps pivoted to the stripping-plate, having heads adapted to engage the cover of the flask, and lower end portions adapted to



engage the cams, whereby, when the shaft  
is rotated in one direction, the clamps are  
opened, and in the opposite direction are  
closed, and their heads pressed on the cover  
5 of the flask, and a lever for rotating the shaft,  
substantially as shown and described.

In witness whereof we have hereunto set

our hands this 12th day of September, A. D.  
1900.

JOHN W. MURRAY.  
CYRUS W. FIELD.

Witnesses:

P. A. MACGAHAN,  
G. W. HARMON.