

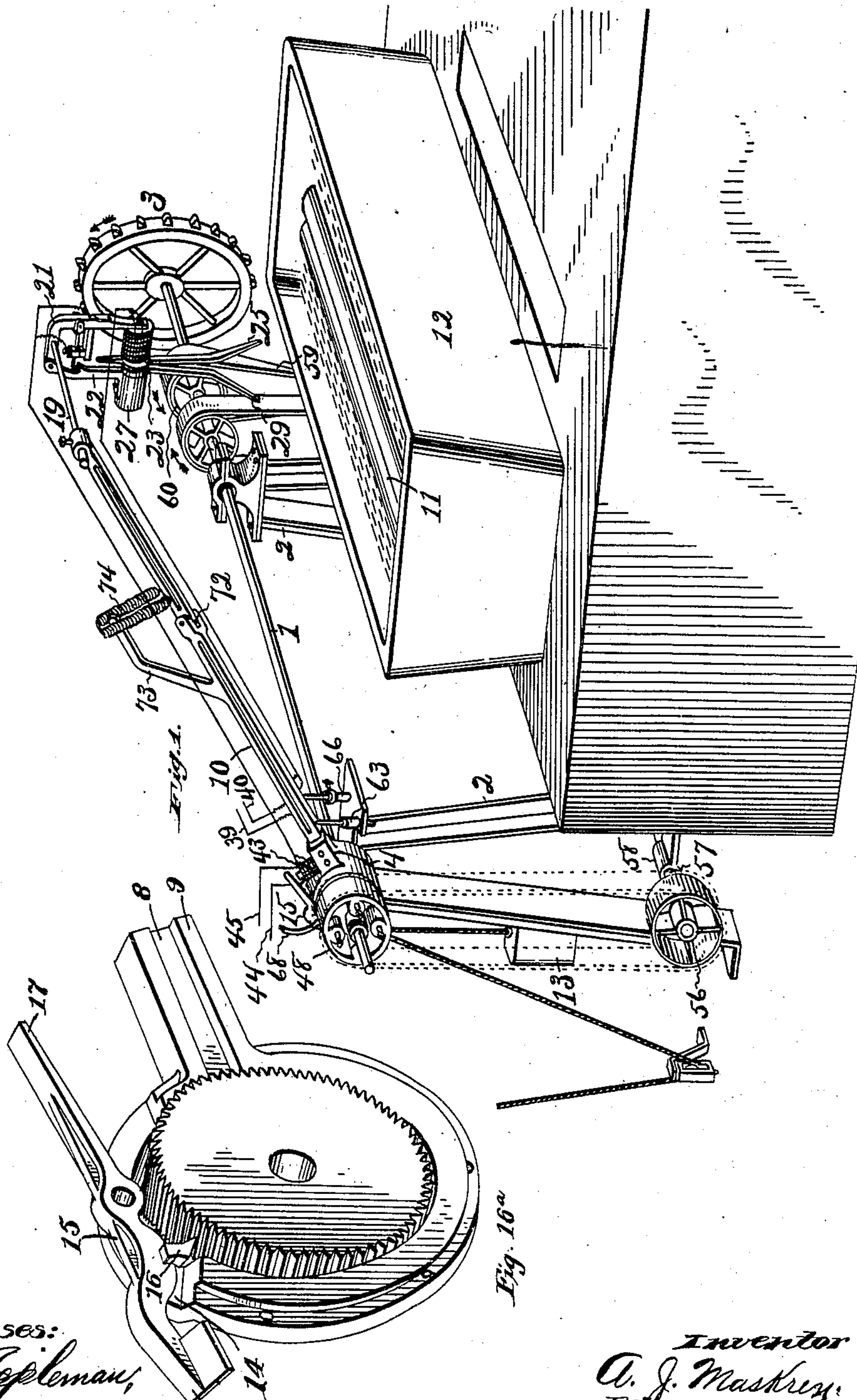
No. 763,192.

PATENTED JUNE 21, 1904.

A. J. MASKREY.  
AUTOMATIC CATCHER.  
APPLICATION FILED OCT. 30, 1902.

NO MODEL.

4 SHEETS—SHEET 1.



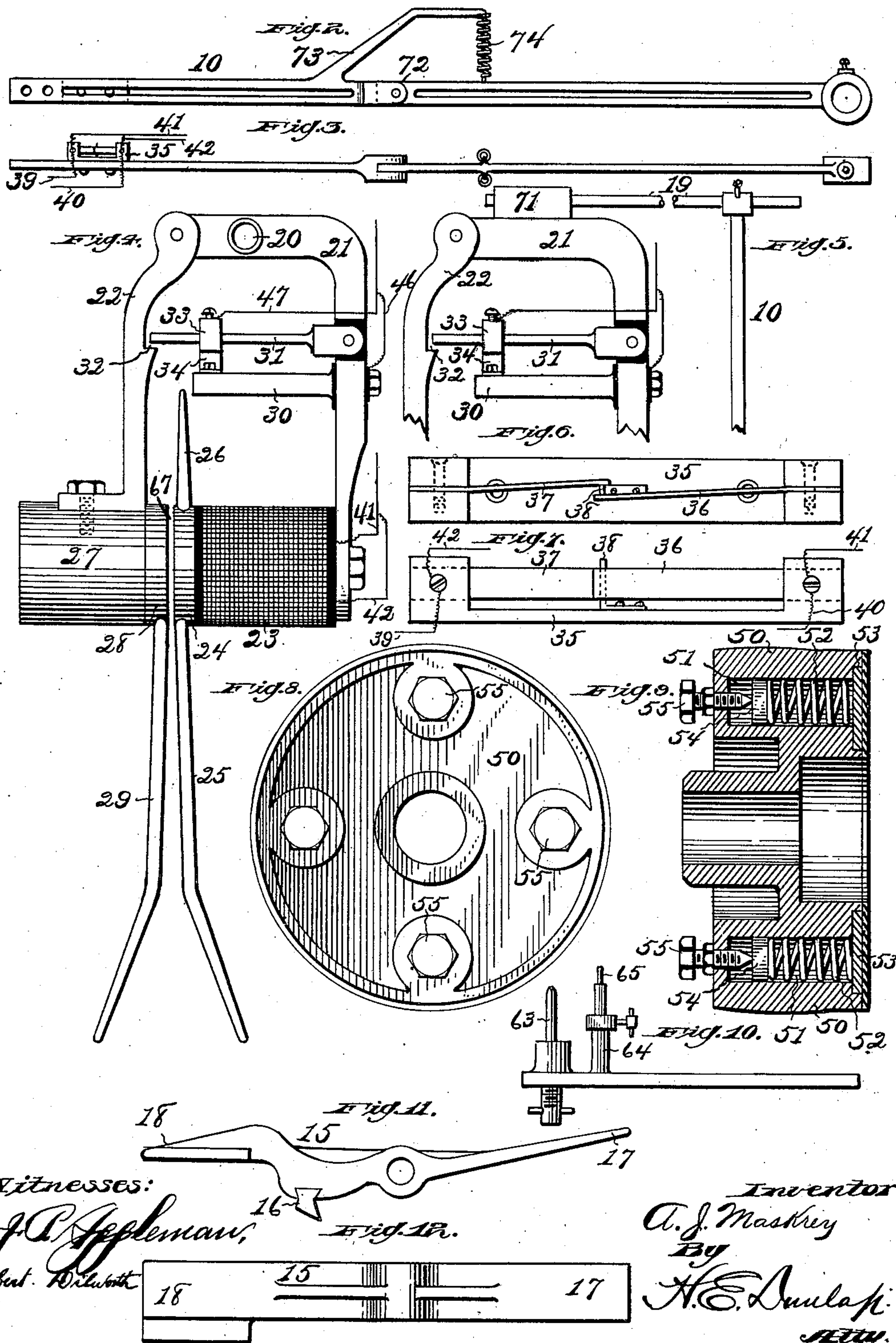
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*A. J. Maskrey,*  
By  
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Att'y.

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4 SHEETS—SHEET 2.



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4 SHEETS—SHEET 3.

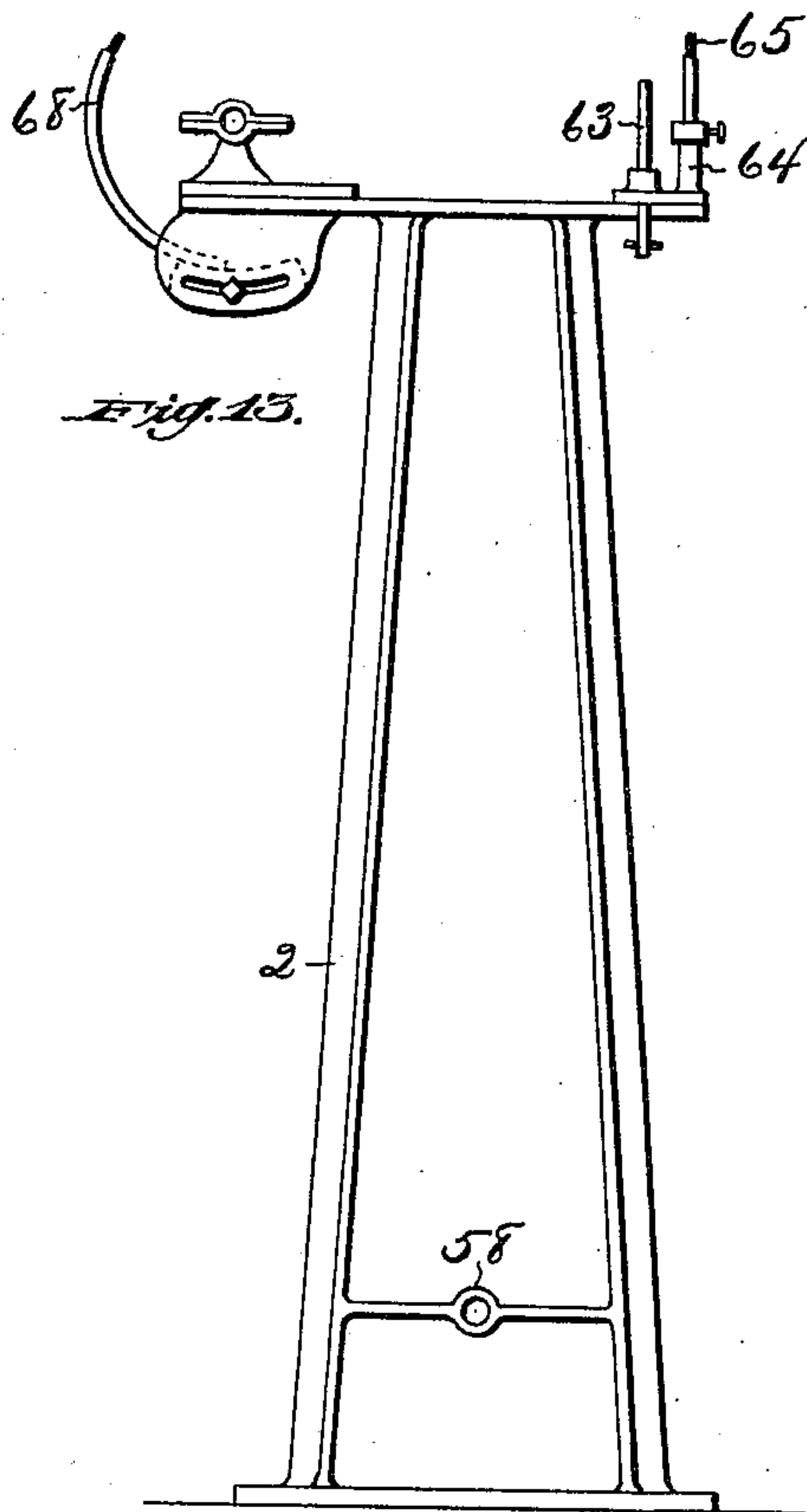


Fig. 13.

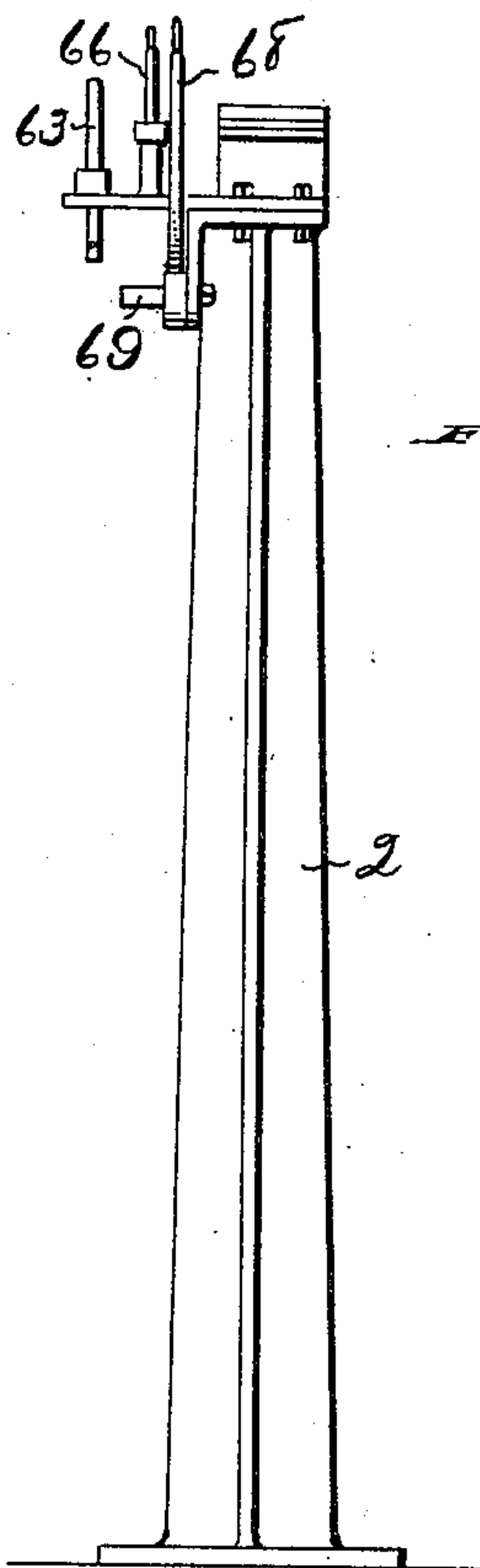


Fig. 14.

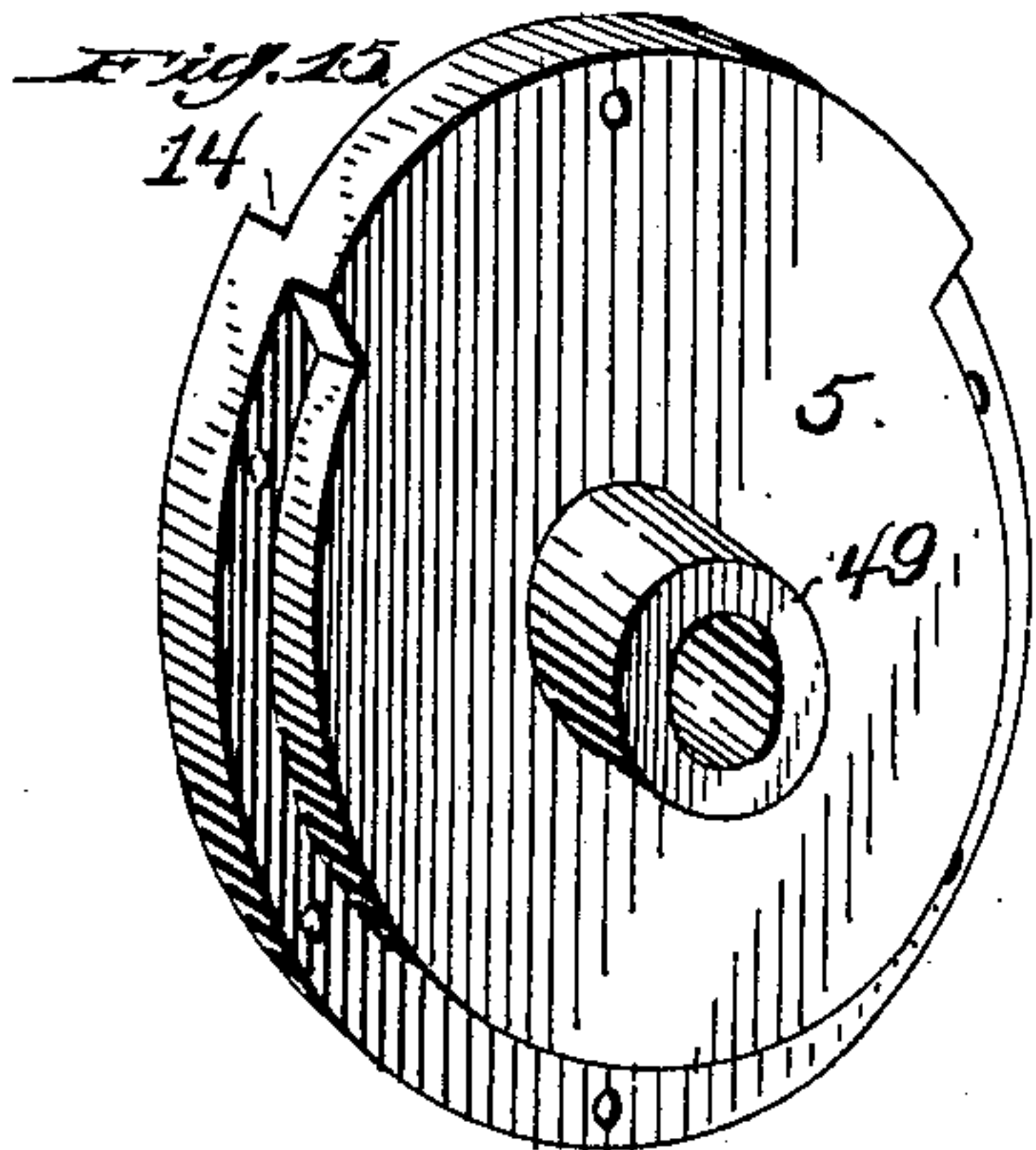


Fig. 15.

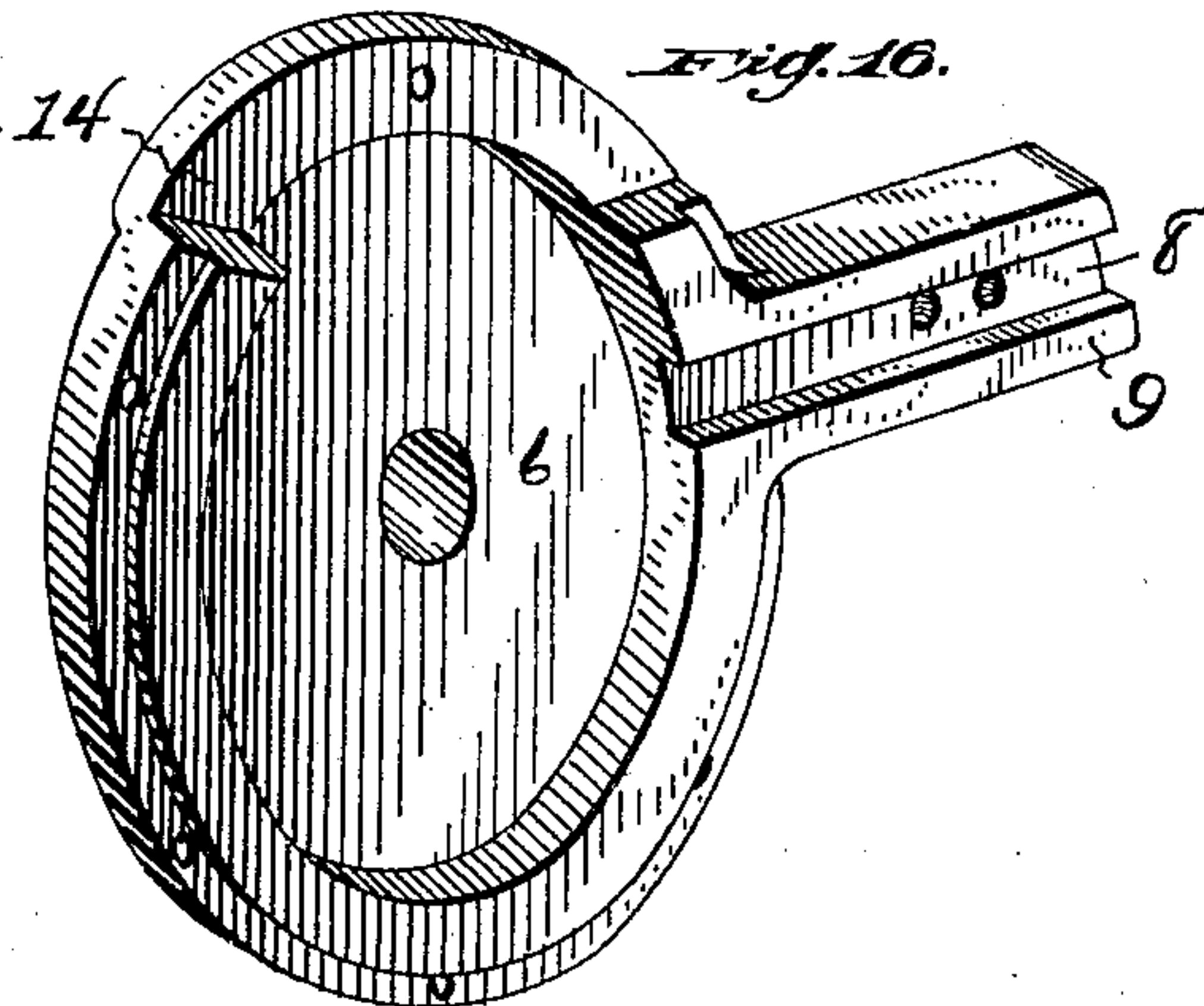


Fig. 16.

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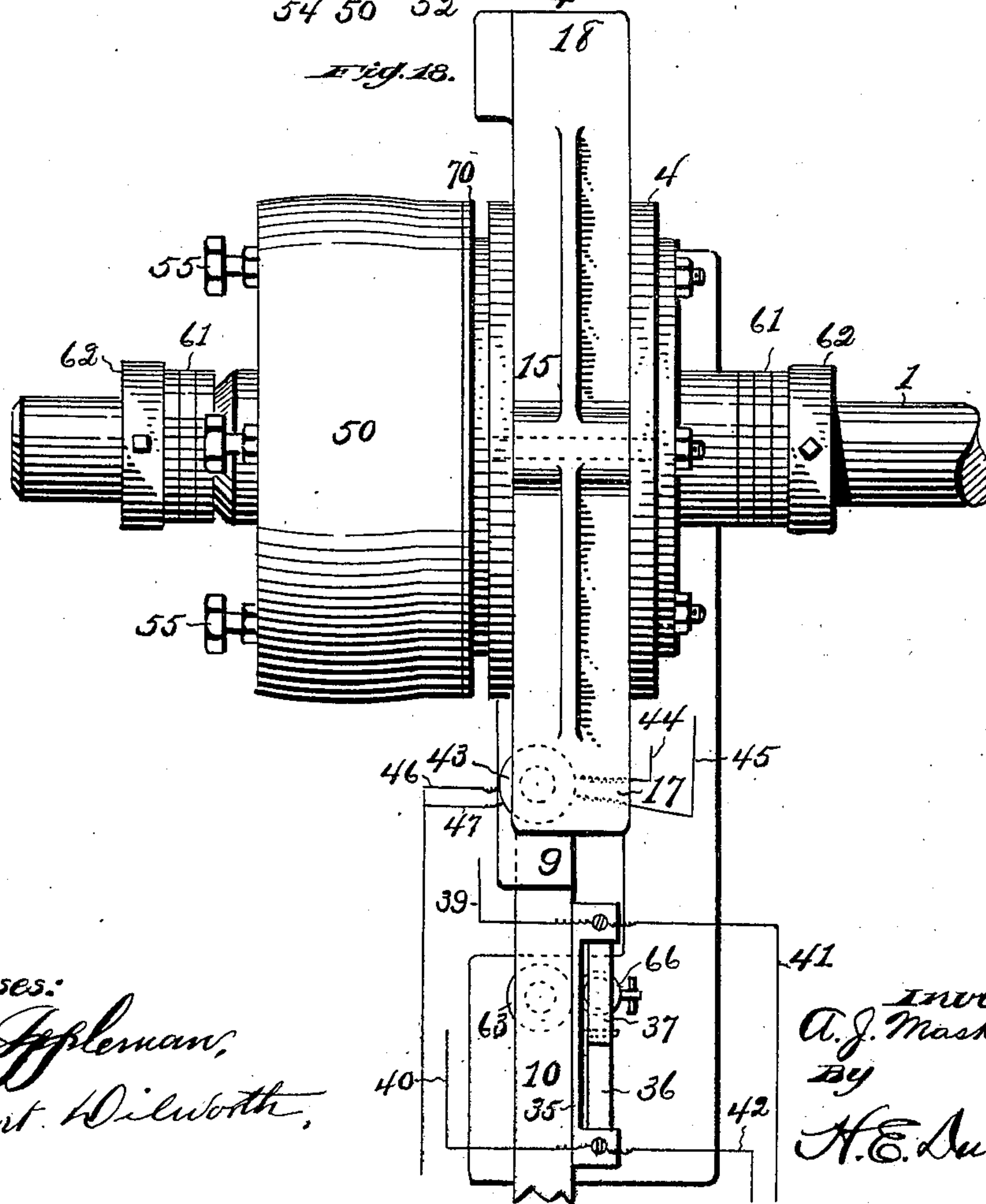
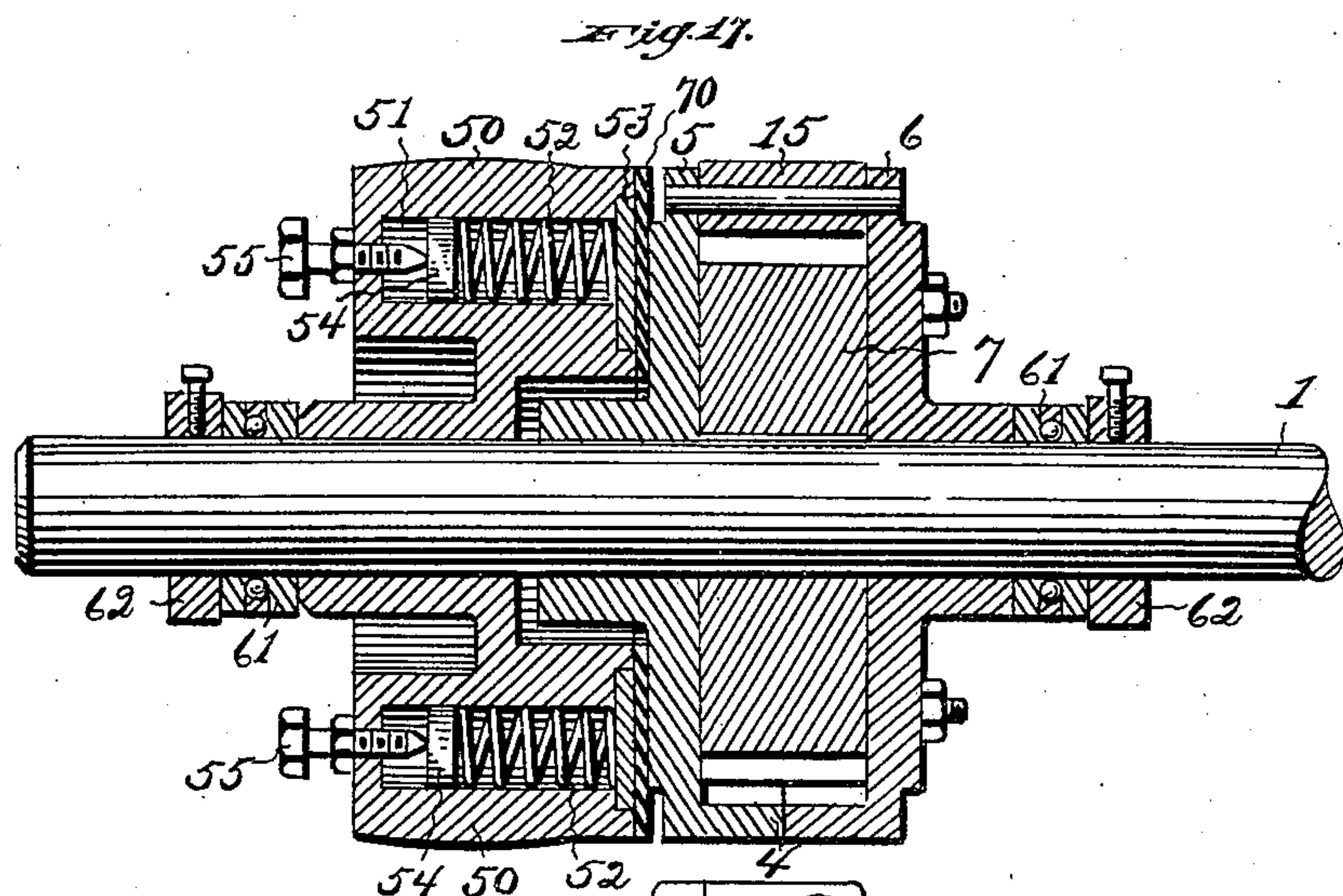
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NO MODEL.

4 SHEETS--SHEET 4.



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# UNITED STATES PATENT OFFICE.

ARTHUR JAMES MASKREY, OF MARTINS FERRY, OHIO.

## AUTOMATIC CATCHER.

SPECIFICATION forming part of Letters Patent No. 763,192, dated June 21, 1904.

Application filed October 30, 1902. Serial No. 129,394. (No model.)

*To all whom it may concern:*

Be it known that I, ARTHUR JAMES MASKREY, a subject of the King of Great Britain, and a resident of Martins Ferry, county of Belmont, and State of Ohio, have invented certain new and useful Improvements in Automatic Catchers, of which the following is a specification.

My invention relates to improvements in catchers for metal plates, and more particularly to an automatic machine for grasping metal plates as they rise from the rolls of a tinning-pot in the tinning or other metal-coating process and for carrying said sheets back and delivering them to a feeder for branners, which feeder for branners is fully shown and described in my application for patent therefor, said application being filed simultaneously herewith.

The object of my invention is to provide an automatic catcher for metal plates which is applicable to any style of tinning-pot now in general use, the same being comparatively simple in its construction, comparatively inexpensive to manufacture and operate, and purely automatic in its operation, being set in operation by the metal plate as it rises from the pot, and consequently remaining at rest when no sheets of metal are being fed through the pot.

With these and other objects in view my invention finally consists in the particular construction, arrangement, and combinations of parts, which will hereinafter be fully described, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a perspective view of my invention complete. Fig. 2 is a side elevation of the main arm. Fig. 3 is a top plan view of the same. Fig. 4 is a side elevation of the tongs. Fig. 5 is a similar view of a portion of the same, showing a slight modification in the construction. Fig. 6 is a side view of the contact-plates on the main arm. Fig. 7 is a top plan view of the same. Fig. 8 is an outer end view of the clutch. Fig. 9 is a cross-section of the same. Fig. 10 is a side elevation of the front arm-rest and of the front circuit-breaker. Fig. 11 is a side elevation of the

pawl. Fig. 12 is a top plan view of the same. Fig. 13 is a side elevation of the supporting-stand, showing the rear circuit-breaker and stops, as well as the front circuit-breaker and arm-rest. Fig. 14 is a rear view of the same. Fig. 15 is a perspective view of one section of the ratchet-casing, showing the outer face thereof. Fig. 16 is a similar view of the other section of the ratchet-casing, showing the inner face thereof. Fig. 16<sup>a</sup> is a perspective view of one section of the ratchet-casing, showing the pawl and ratchet. Fig. 17 is a cross-section of the mechanism on the shaft, and Fig. 18 is a top plan view of the same.

Referring to the drawings, in which like reference-numerals designate like parts throughout the several views, 1 indicates a revolving shaft extending longitudinally of the tinning-pot at one end thereof and suitably journaled in supports 2, said shaft being driven by chain connecting the fixed wheel 3 with the motive power. Loosely mounted on said shaft 1 is a casing 4, composed of two sections 5 and 6, which inclose a ratchet 7, keyed on the shaft. Bolted to said casing in the channel 8 of the lug 9 is one end of an arm 10, which normally extends forward to a point directly over the point of contact of the rolls 11 in the pot 12. From the rear portion of the casing 4 is suspended in any suitable manner a weight 13, adapted to partially equalize the weight of the main arm 10, and consequently reduce the strain and vibration on the various parts when the said arm returns to a horizontal position.

Pivoted in an offset 14 in the casing 4 is a pawl 15, the point 16 of which is adapted to engage the teeth of the ratchet 7. The rear end 17 of the pawl 15 extends over the arm 10, and the front end 18 thereof extends rearwardly beyond the casing 4 and is weighted, so as to counterbalance the rear end 17 and to normally hold the point 16 in engagement with the ratchet.

Adjustably secured on the extreme front end of the main arm 10, over the rolls 11, is an arm 19, which extends at right angles to the main arm 10. Loosely mounted or pivoted on the point of the arm 19, the point of said arm passing through the opening 20, is the sheet-grasping mechanism or tongs, the



construction of which is substantially as follows: The opening 20, above mentioned, extends through a substantially L-shaped rod 21, which has pivoted thereto at its rear end a  
 5 bar 22. Secured on the rear face of the lower end of the L-shaped rod 21 is an electromagnet 23, on the face of which is secured a collar 24, having a downwardly-extending guide-rod 25 and also an upwardly-extending guide-  
 10 26. Secured to the lower end of the bar 22 at a point directly opposite the magnet 23 is a metal block 27, preferably of wrought-iron, which has secured thereto a collar 28, having a downwardly-extending guide-rod 29, similar  
 15 to the rod 25. Secured to the rod 21 in a suitable position above the magnet 23 and insulated from the rod 21 is a small bar 30, which extends rearwardly from said rod 21. Also pivotally secured to the rod 21 at a point directly above the bar 30 is a small bar 31, the  
 20 point of which extends rearwardly to the bar 22, in the recess 32 of which said point is adapted to normally lie. On the bar 31 and insulated therefrom is provided a contact-plate 33, adapted to normally lie in contact with a plate  
 25 34 on the bar 30. The object of the tongs, consisting of the mechanism just described, will presently be shown.

Secured to the side of the main arm 10 at a  
 30 point near its connection with the ratchet-casing 4 is a plate 35. To each end of said plate is secured one end of a flexible contact-plate, said contact-plates 36 and 37 having their respective free ends or points normally resting  
 35 against the opposite sides of a small projection 38. The said contact-plates are connected by wires 39 and 40, respectively, with a main electric battery or dynamo and also by wires 41 and 42 with the electromagnet 23.  
 40 Suitably mounted on the lug 9 of the casing is an electromagnet 43, which is connected by wires 44 and 45 with the main battery or dynamo and also by wires 46 and 47 with the bar 30 and the contact-plate 33, respectively.  
 45 The object of the above-described wiring connections will be presently shown.

A friction-clutch 48 is loosely mounted on the shaft 1 and the hub 49 of section 5 of the casing 4 and is adapted to operate against the  
 50 outer face of said casing. Referring to Figs. 8, 9, 17, and 18, 50 is the clutch proper, the same being cored out at intervals, forming holes 51, in each of which is located a spring 52. A circular plate 53 is fitted in said clutch  
 55 proper over the holes 51, against which the springs 52 rest. In the inner end of each hole is provided a plate or disk 54, against which the inner end of the spring rests, and extending into each hole from the outer face of  
 60 the clutch proper are adjusting-screws 55, adapted to be manipulated to adjust the tension of the springs against the disk 53, and thus regulate the pressure against the face of the casing 4. The friction-clutch is connected  
 65 by belt (shown in dotted lines in Fig. 1) with

a belt-wheel 56, provided on a shaft 57. Said shaft 57 is journaled in bearings 58, provided in the lower part of the supports 2, and is driven from the shaft 1 by a twisted belt 59, connecting fixed belt-wheels 60, provided on  
 70 the respective shafts. As is obvious, the shaft 1 being driven backward the clutch is driven forward, or in the opposite direction from that taken by the shaft. To facilitate the movement of the clutch and the casing on the shaft  
 75 1, ball-bearing collars 61 are provided thereagainst, which collars are held in place by fixed collars 62.

The contact-plates 36 and 37 are made of thin flexible metal, so that the points thereof  
 80 may be readily pushed out of engagement or contact with the projection 38 to break an electric circuit passing through them and so that when the cause of deflection is removed their points will spring back into contact with said  
 85 projection, renewing the circuit.

All the connecting-wires are extended along the arms to an axial point, so that they will in no way interfere with the movement of  
 90 said arms or with the operation of any of the parts. However, for the sake of clearness they are not so shown in the illustrations. The main arm 10 normally lies in the position illustrated in Fig. 1, in which it is shown resting  
 95 on the adjustable arm-rest 63.

64 represents an upright tubular projection or post in which is adjustably mounted a non-conducting pencil, said post and pencil forming a circuit-breaker 66, which when the arm  
 100 10 lies at rest holds the contact-plate 36 in a raised position, arresting the electric circuit to the electromagnet 23.

The operation of my invention is substantially as follows: When a sheet of metal rises between the rolls 11 in the pot 12, it is guided  
 105 by the guides 25 and 29 through the passage 67 between the electromagnet 23 and the metal block 27. As the sheet rises the upper edge thereof strikes the point of the bar 31 and forces the same upward, breaking the contact  
 110 between the contact-plate 33 and the bar 30, and consequently breaking the circuit through the electromagnet 43. Immediately upon the breaking of said circuit the rear end 17 of the pawl, which has been held by magnetic attraction in engagement with the said electro-  
 115 magnet, holding the point 16 out of engagement with the ratchet, is released, allowing the said point to drop into engagement with the ratchet. The ratchet, being fixed to the shaft  
 120 1 and turning backward therewith, then carries the arm 10 upward and over therewith. When the arm 10 begins to rise from the circuit-breaker 66, the contact-plate 36, which has thereby been held out of contact with the pro-  
 125 jection 38, is permitted to spring back into engagement, renewing the circuit to the electromagnet 23. Immediately the sheet of metal is securely grasped between the collars 24 and 28, the said block 27 being drawn by mag-  
 130



netic attraction against the sheet on the side opposite the magnet, so as to grip it. The wrought-iron block 27 furnishes a sufficient body of metal to cause the sheet to be tightly grasped. When the arm 10, carrying the metal sheet, reaches the delivery-point, the contact-plate 37 is struck by the point of an adjustable circuit-breaker 68, suitably located, and is sprung away from the projection 38, breaking the circuit through the magnet 23 and releasing the sheet. Immediately upon the release of the sheet the pivoted bar 31, carrying the contact-plate 33, which has been held in a raised position by the sheet, drops back to its normal position, renewing the circuit through the magnet 43. At the same time that the sheet is released, as above described, the front end 18 of the pawl strikes upon the adjustable stop 69. The impact of the said front end of the pawl against said stop withdraws the point 16 from engagement with the ratchet. The circuit through the magnet 43 having been renewed when the sheet was released, the rear end 17 of the pawl is now held by magnetic attraction in contact with said magnet 43, and consequently the point 16 is held out of engagement with the ratchet. The friction generated against the casing 4 by the clutch, which has preferably a washer, of leather or other suitable material, between the disk 53 and the casing, is sufficient to return the said casing and the arm 10 to the normal position thereof—that is, in position for a repetition of the operation just described. As is obvious, when the arm 10 returns to its normal position the circuit through the magnet 23 is broken, the point of the contact-plate 36 being thrust upward out of contact with the projection 38 by the circuit-breaker 66.

The circuit-breaker 68 is provided with a tip formed of a non-conducting material.

The arm 10 is composed of two sections hinged together at 72, the joint formed at the point 72 being what is known as a "knuckle-joint." (Clearly illustrated in Figs. 1, 2, and 3.) As a support for the front section of the main arm an angular arm 73 is provided on the rear section thereof, to the point of which are secured the ends of springs 74, having their lower ends secured to said front section. As is apparent, the object of this construction of the main arm is to eliminate to a great extent the vibration which is consequential to the dropping of said arm to its normal position on the arm 63.

The machine just described is adapted for use with a single tinning-pot. It is obvious, however, that another machine of the same construction may be located in a suitable position on the same shaft 1, thus adapting the device to a jumbo pot. Furthermore, when it is desired to use the machine with a double pot—a pot having a double set of rolls therein—the shaft 1 has but to be placed at the side of the pot instead of at the end, so that the

arm 10 lies in line with the rolls, and two machines placed side by side on said shaft, the two main arms each lying on one side of each pair of rolls and parallel to said rolls. However, with this construction, in order to have the tongs in a sheet-grasping position it is necessary to alter the position of the arm 19 on the end of the main arm. This alteration consists in providing on the top of the L-shaped member of the tongs a swell 71, (see Fig. 5,) having a longitudinal opening therethrough, through which opening the rear end of the arm 19 is projected instead of through the opening 20, as shown in Fig. 4. As is obvious, this latter construction may be used with the single pot—that is, the arm may be located at the side of the pot and lie in line with the rolls. With the jumbo pot, however, this latter construction is not used.

The contact-plates 36 and 37, as is apparent, may be formed of stiff material, with a spring or like device attached for causing them to remain normally in contact.

The framework or members forming the tongs are preferably made of brass, since this material will not retain residual or remanent magnetism to such an extent as iron and steel.

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

1. In an automatic catcher, a driving-shaft, a fixed ratchet on said shaft, a loose casing on said shaft about said ratchet, a pawl mounted on said casing and adapted for engaging said ratchet, electrical connections whereby the pawl is normally held out of engagement with said ratchet, a main arm attached to said casing, sheet-grasping tongs mounted on said arm, electrical connections mounted on said arm and tongs for causing said tongs to grasp a metal sheet, means for releasing the pawl to cause it to engage the ratchet at the proper time, and means whereby the electrical circuits passing through the tongs are broken to release the sheet at the proper time, all substantially as specified.

2. An automatic catcher for tinning-pots, comprising a driving-shaft suitably mounted and located with relation to the pot, a ratchet fixed to said shaft, a casing loosely mounted on said shaft about said ratchet, a main arm secured to said casing and normally resting with its point over or alongside the rolls in the pot, an arm secured to the point of the main arm, tongs pivoted on the end of said arm at a point directly over the point of contact of the rolls, electrical connections and magnets whereby when a sheet of metal rises between the jaws of the tongs it is seized thereby and the main arm is caused to turn with the driving-shaft, means whereby when the sheet-delivery position is reached the sheet is released and is permitted to drop, means whereby the main arm is released from turning with the shaft, a friction-clutch loosely



mounted on said shaft and suitably driven, whereby the said arm is returned to its normal position, substantially as specified.

3. An automatic catcher for metal plates, comprising a main shaft suitably driven, a ratchet fixed on said shaft and revolving therewith, a casing loosely mounted on said shaft about said ratchet, a pawl for engaging said ratchet suitably mounted in said casing, an electromagnet mounted on the casing under the rear end of said pawl and normally holding said pawl out of engagement with the ratchet, a main arm secured to said casing, plate-grasping tongs mounted on said arm, electrical contact-plates on said tongs, wires connecting said contact-plates with said magnet, said contact-plates adapted to be forced apart by a metal plate rising between the jaws of the tongs to break the electric circuit through them to the said magnet, releasing the pawl so that it engages the ratchet and carries the arms and tongs therewith; an electromagnet on the tongs, a metal block opposing said magnet, wires connecting said magnet with contact-plates provided on the main arm, a contact-breaker holding said contact-plates out of engagement when said arm lies at rest and permitting the circuit to be renewed through the contact-plates when the arm is raised therefrom, said circuit causing the plate to be grasped by the tongs, a circuit-breaker at the rear side of the shaft for causing the plate to be released, a stop for withdrawing the pawl from the ratchet, and a clutch loosely mounted on the main shaft and turning forward thereon for returning the arm and tongs to their normal position, substantially as set forth and described.

4. In a machine of the character described, the combination with the upper rolls of a tinning-pot, of a sheet grasping and carrying machine, comprising a shaft having a fixed ratchet thereon, a main arm loosely mounted on said shaft, a pawl attached to said arm and adapted for engagement with said ratchet, an electromagnet mounted on said arm in juxtaposition to the rear end of the pawl and normally holding said pawl out of engagement with the ratchet, tongs provided on said main arm, electrical connections between said tongs and said magnet whereby when a sheet of metal rises from the rolls of the tinning-pot the pawl is permitted to engage the ratchet, a magnet carried by said tongs, electrical connections between said magnet and said arm whereby when said arm begins to rise said sheet of metal is firmly grasped by the tongs, means whereby when the sheet-delivery position is reached the sheet of metal is caused to be released, means whereby when the sheet-delivery position is reached the pawl is thrown out of engagement with the ratchet, and means whereby the main arm, carrying the tongs, is returned to its normal position, substantially as described.

5. In a plate-catching machine, a main arm composed of two sections hinged together, an angular arm on the rear section extending over the front section, a spring having one end secured to the point of said angular arm and the other to the front section of the main arm, supporting said front section, substantially as described.

6. In a machine of the character described, supports suitably located with reference to the tinning-pot, a main shaft mounted on said supports, a ratchet fixed on said shaft, a casing loosely mounted on said shaft about said ratchet, an extension on said casing, a pawl pivoted on said casing for engaging the ratchet, an electromagnet on said extension directly underneath the rear end of the pawl and adapted to normally hold said pawl out of engagement with said ratchet, a main arm secured to said extension, tongs pivoted on the point of said arm; said tongs consisting of two pivoted members, an electromagnet on one member and a metal block on the other member, said magnet and block lying in juxtaposition, and sheet-guiding arms provided on each of the two members; a fixed bar and a movable bar on one of said members, contact-plates on each of said bars normally lying in contact completing an electric circuit through conducting-wires connecting them with the first-mentioned magnet, contact-plates on the main arm, conducting-wires connecting the last-mentioned contact-plates with the magnet on the tongs, a circuit-breaker normally holding said contact-plates out of engagement arresting the electric circuit to said magnet, means whereby when the main arm is raised said contact-plates are brought into engagement completing the electric circuit, an adjustable circuit-breaker at the rear of the main shaft whereby the last-mentioned circuit is broken when the sheet-delivery position is reached, an adjustable stop at the rear of the main shaft whereby the pawl is forced out of engagement with the ratchet when the said delivery position is reached, a friction-clutch mounted on said shaft against the ratchet-casing, said clutch adapted for returning the main arm, carrying the tongs, to its normal position, and driving mechanism for said clutch, substantially as described.

7. In a machine of the character described, a main shaft suitably mounted and driven, a fixed ratchet on said shaft, a ratchet-casing loosely mounted on said shaft about said ratchet, an extension on said casing, an electromagnet mounted on said extension, a pawl pivoted in the top of said casing, the point of said pawl adapted for engagement with said ratchet, the rear end of said pawl normally held in engagement with said magnet, a main arm secured to the extension of the casing, a small arm adjustably secured to the point of said main arm, an L-shaped rod pivoted on said small arm, an electromagnet on said rod, a



bar 22 pivoted to said rod, a metal block on said bar opposite the electromagnet on the rod, said magnet and block lying in juxtaposition, a fixed bar and a pivoted bar carried  
 5 by the L-shaped rod, an electrical contact-plate provided on each of said bars, wiring connections between said contact-plates and the magnet on the extension of the casing; said contact-plates adapted to be separated by  
 10 a sheet of metal rising between the tongs and forcing the pivoted bar upward to break the electric circuit through the magnet on the extension of the casing, releasing the pawl so that it will engage the ratchet and carry the  
 15 main arm, bearing the tongs, over therewith; contact-plates on the main arm, wiring connections between the last-mentioned contact-plates and the magnet on the L-shaped rod, a circuit-breaker holding the said contact-  
 20 plates out of engagement when the main arm lies at rest thus arresting the electric circuit to the last-mentioned magnet; an adjustable stop whereby the pawl is forced out of engagement with the ratchet, an adjustable circuit-  
 25 breaker at the rear of the main shaft whereby when the sheet-delivery position is reached, the circuit through the last-mentioned magnet is broken to release the sheet held by the tongs, and a friction-clutch loosely mounted  
 30 on the shaft in contact with the ratchet-casing and driven forward on said shaft, whereby the casing carrying the main arm is returned to its normal position, substantially as set forth and described.

35 8. In a plate-catching machine, the combination with a plate-grasping mechanism, of a clutch for returning said plate-grasping mech-

anism to its normal position, said clutch comprising a clutch proper loosely mounted on the main shaft and provided with holes 51 40 therein, a circular disk fitted in said clutch proper over said holes, an adjusting-screw for regulating the tension of said springs provided in each of said holes, and a washer provided against the face of the disk, substan- 45 tially as and for the purposes set forth and described.

9. In a plate-catching machine, the combination with a main shaft, ratchet, ratchet-casing, and carrying-arm, of sheet-grasping tongs 50 mounted on said arm, said tongs consisting of two pivoted members suitably suspended over the rolls of a tinning-pot, a metal block mounted on one member and an electromagnet mounted on the other member, the respective 55 faces of said block and magnet lying adjacent to each other; wiring connections between the said magnet and contact-plates provided on the main arm, or carrying-arm, whereby when said plates lie in contact an electric cir- 60 cuit passes to the magnet; contact-plates provided on said tongs, and adapted to be separated by a metal plate rising between the forks of the tongs to break an electric circuit passing therethrough to an electromagnet on 65 the ratchet-casing, all substantially as and for the purposes set forth and described.

Signed by me at Wheeling, West Virginia, this 20th day of October, 1902.

ARTHUR JAMES MASKREY.

Witnesses:

H. E. DUNLAP,  
 JOHN A. BROWN.