

A. E. MILLER.
MACHINE FOR CASTING TYPE.
APPLICATION FILED MAY 20, 1909.

999,513.

Patented Aug. 1, 1911.

4 SHEETS—SHEET 1.

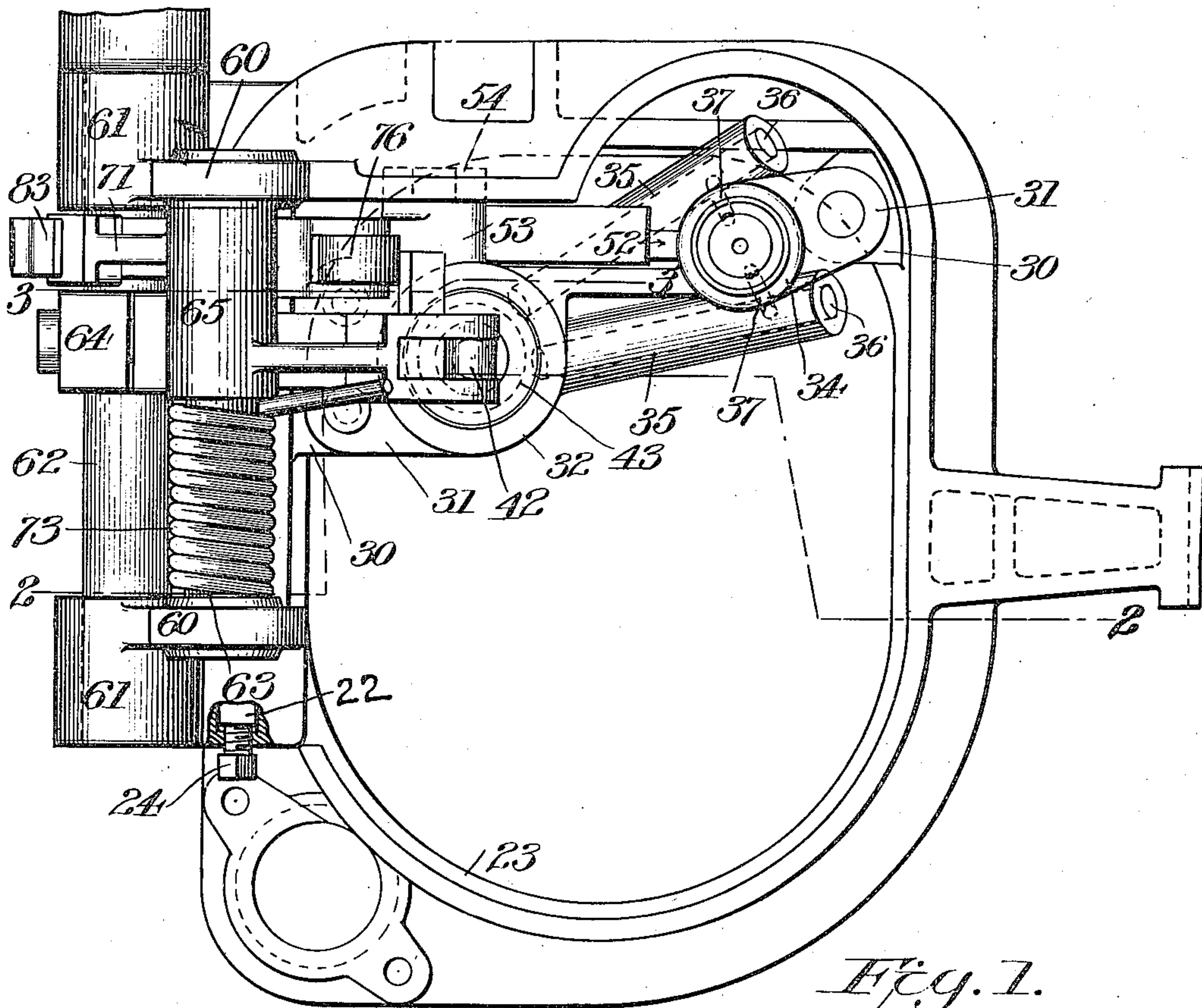


Fig. 1.

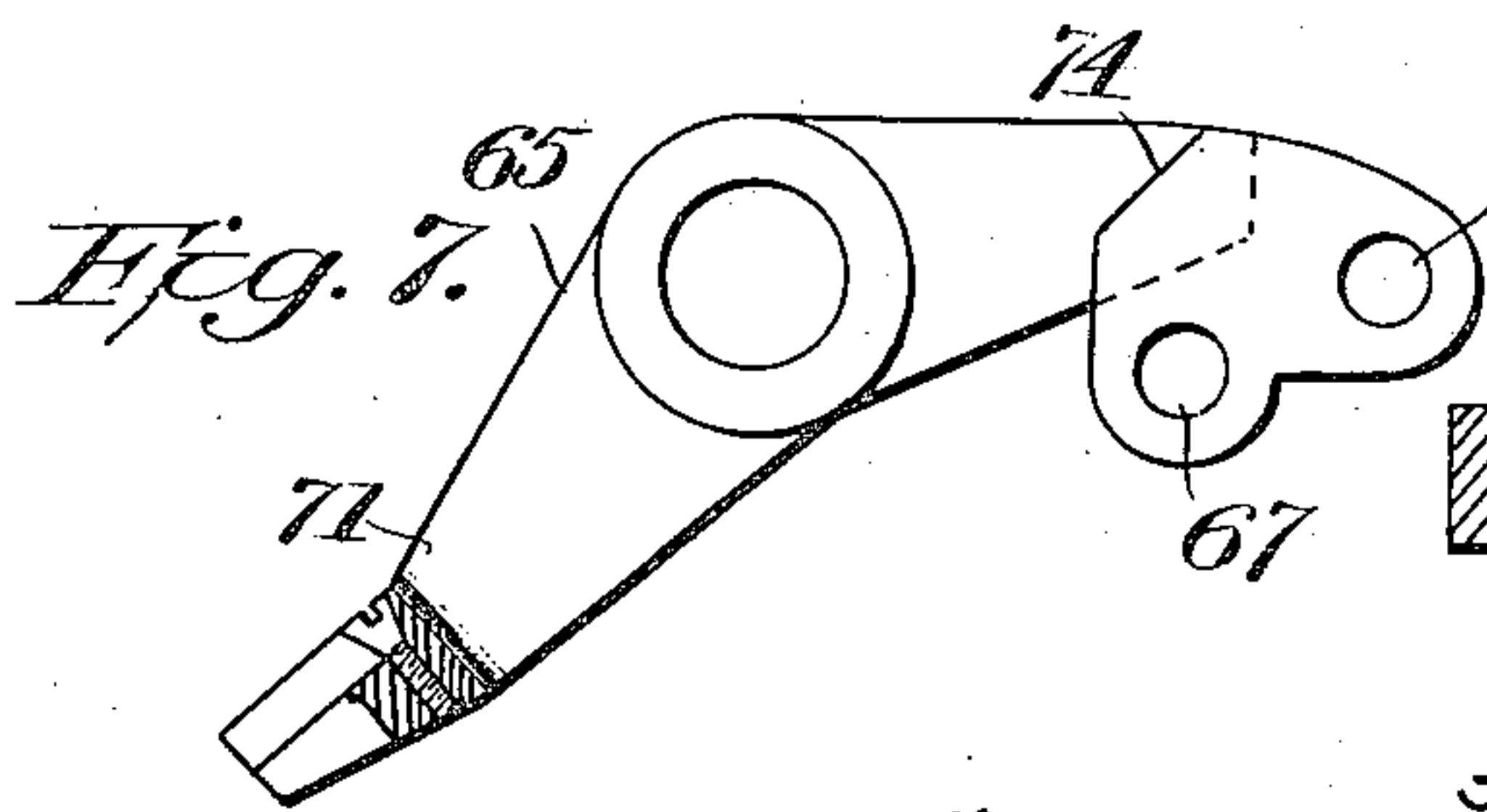


Fig. 7.

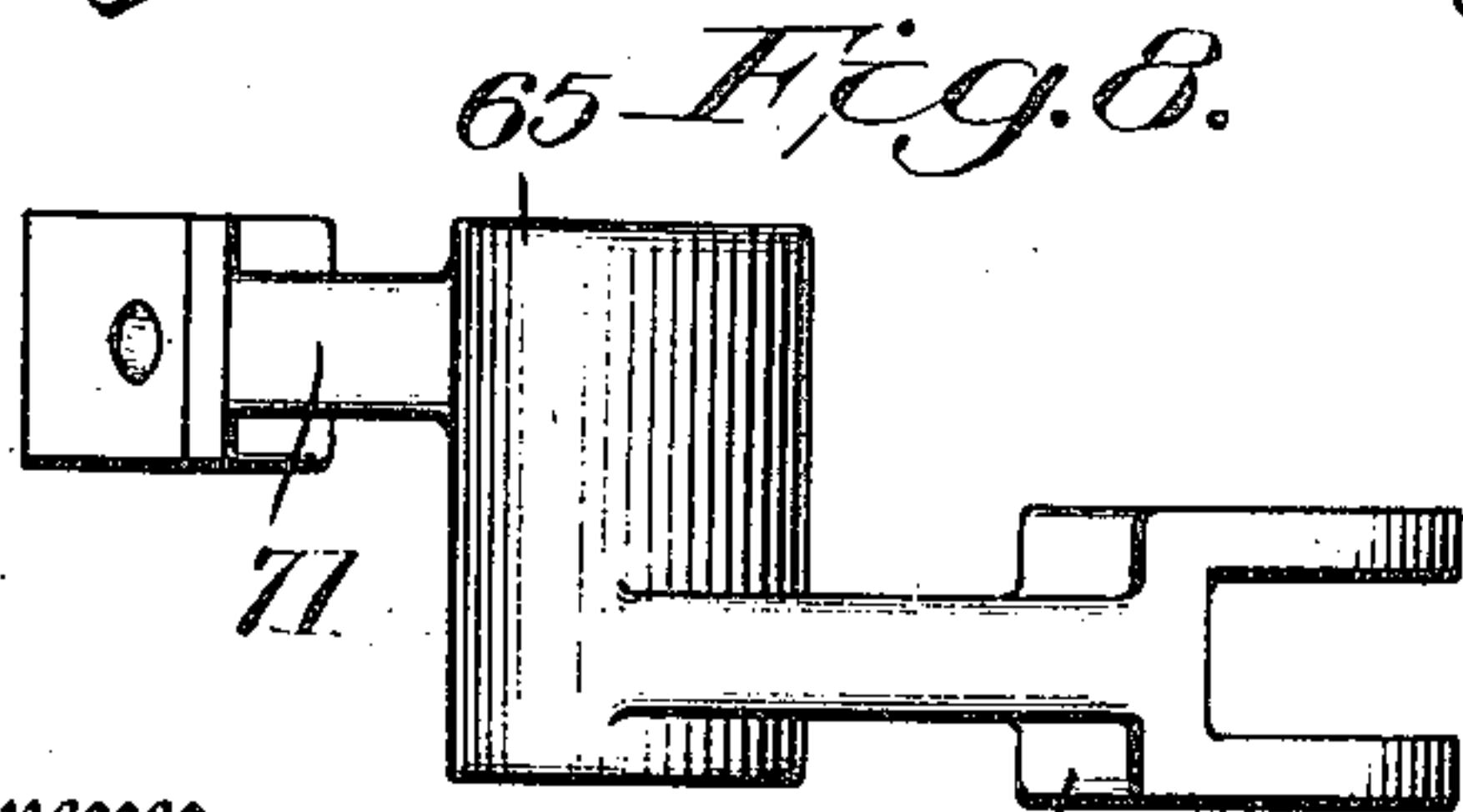


Fig. 8.

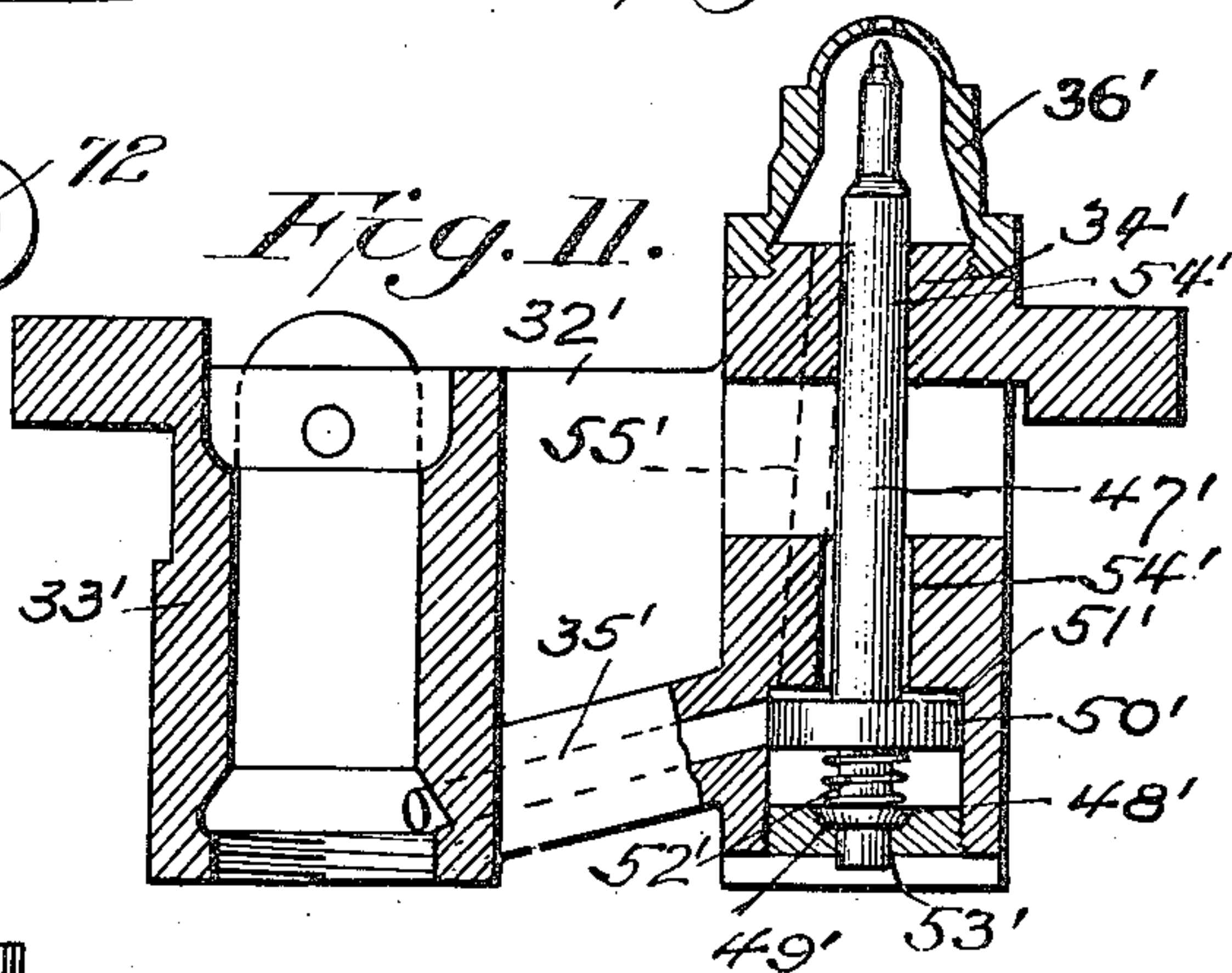


Fig. 11.

Witnesses
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Elmer King

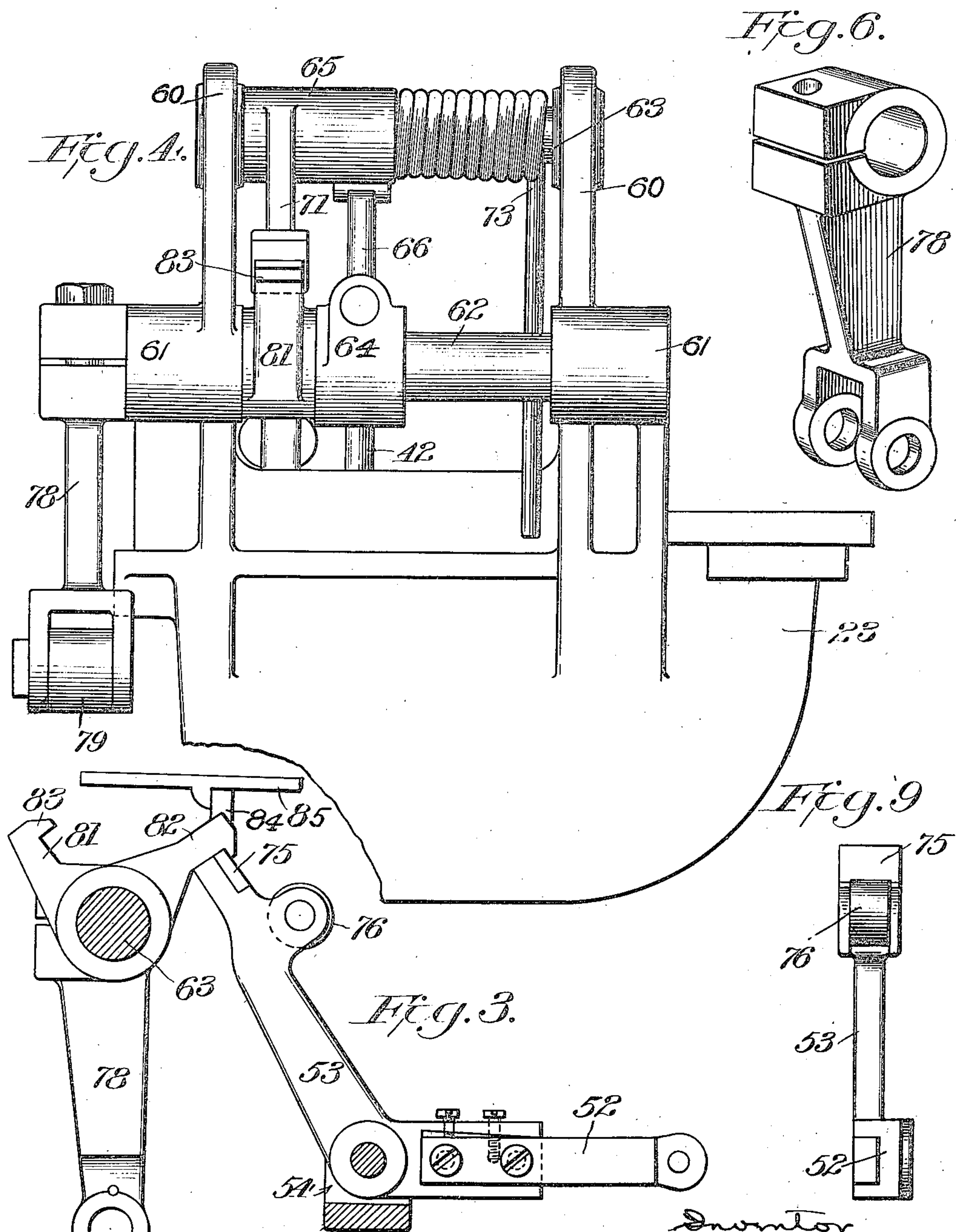
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4 SHEETS—SHEET 3.



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By

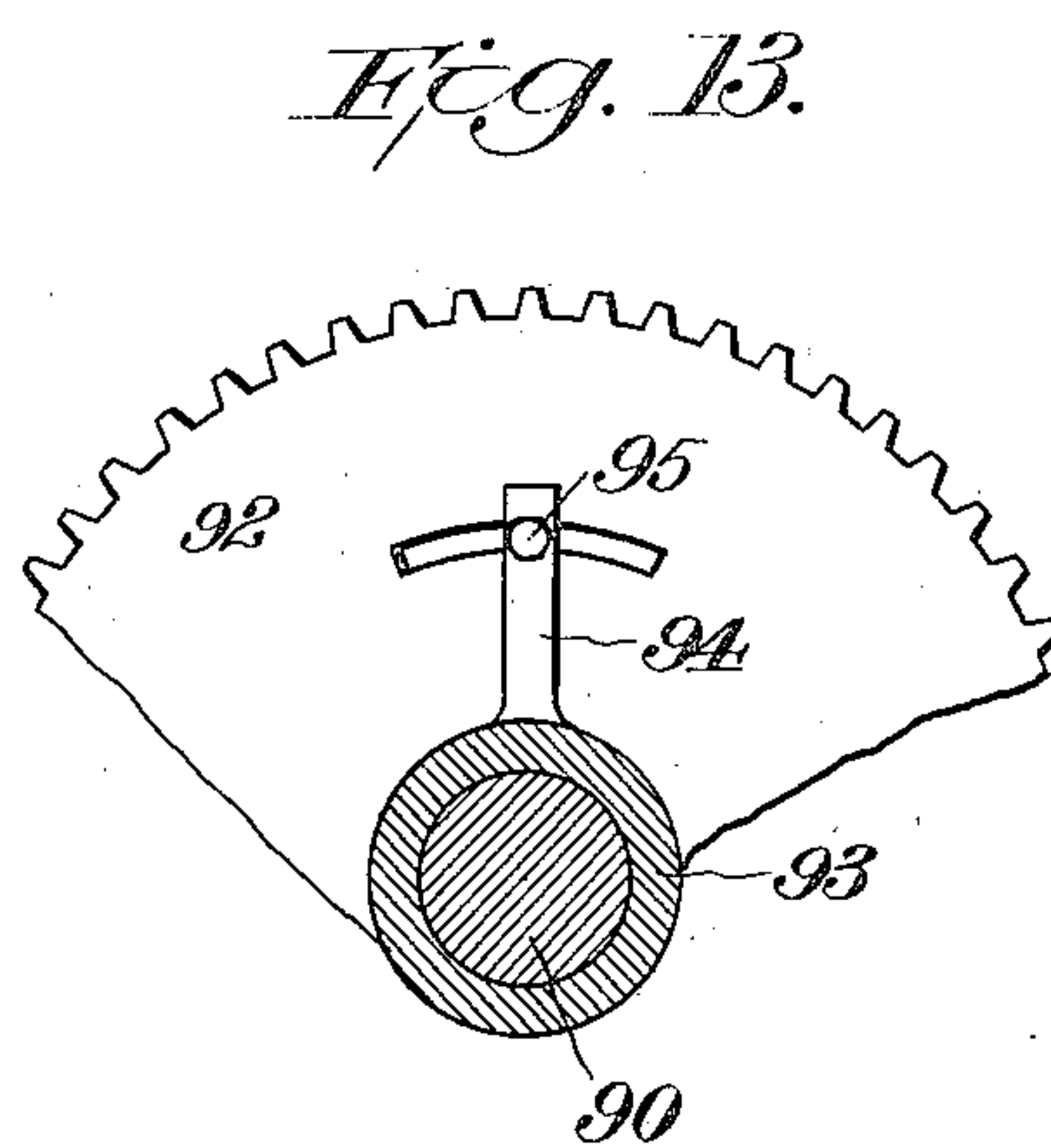
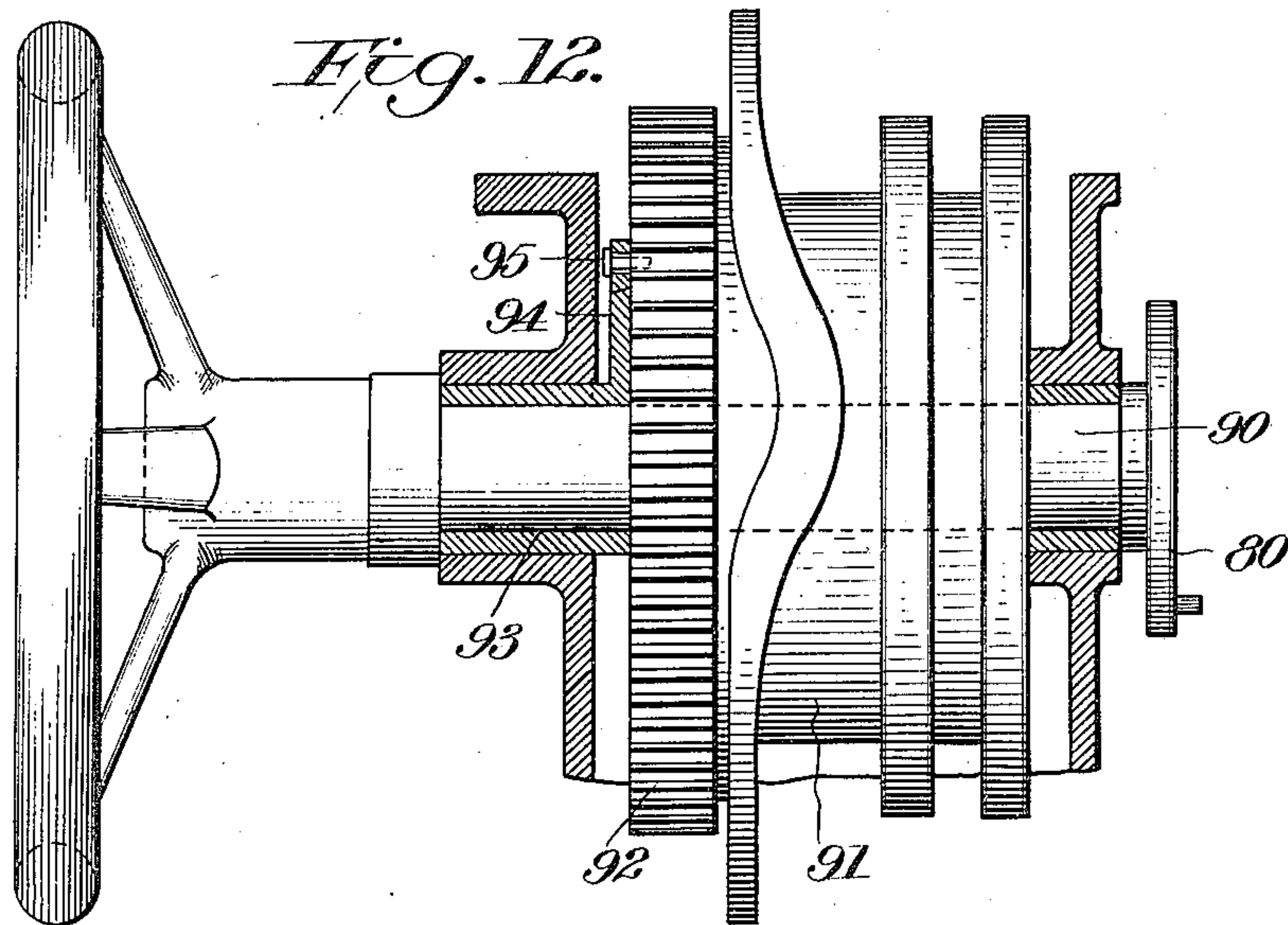
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4 SHEETS—SHEET 4.



Witnesses

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UNITED STATES PATENT OFFICE.

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MACHINE FOR CASTING TYPE.

999,513.

Specification of Letters Patent.

Patented Aug. 1, 1911.

Application filed May 20, 1909. Serial No. 497,203.

To all whom it may concern:

Be it known that I, ANDREW E. MILLER, of Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Machines for Casting Type, of which the following is a specification.

This invention contemplates certain new and useful improvements in machines for casting type, and relates more particularly to molten metal injecting mechanism adapted for use in connection with machines of this character.

The invention has for its object the production of means for simplifying the construction of the pump casing.

A further object is to improve the construction of the pump nipple and the choker valve operating therein.

A further object is to provide improved means for actuating the pump plunger and choker valve in time with each other.

The invention will be hereinafter fully set forth and particularly pointed out in the claims.

In the accompanying drawings:—Figure 1 is plan view of a portion of a type casting machine with my invention applied thereto. Fig. 2 is a transverse sectional view on the line 2—2, Fig. 1. Fig. 3 is a similar view on the line 3—3, Fig. 1. Fig. 4 is a side elevation. Fig. 5 is a sectional view of the pump and its adjuncts, parts being shown in section. Fig. 6 is a detail view of the main pump operating lever. Figs. 7 and 8 are detail plan and side views, respectively, of the pump latch lever. Fig. 9 is a detail view of the choker-operating lever. Fig. 10 is a detail of the pump-and-choker-operating lever. Fig. 11 is a modification of the pump. Fig. 12 is a view illustrating the cam mechanism. Fig. 13 is a detail thereof.

Referring to the drawings, 20 designates the base of a type casting machine, and 21 the mold mechanism, which may be of any suitable or preferred construction. Said base is provided with parallel supporting bars 22 on which is slidingly mounted the metal pot 23, the latter being provided with an adjusting screw 24 engaging the end of one of the bars 22, whereby the position of the metal pot may be adjusted with relation to the mold mechanism.

The metal pot 23 is provided with shoulders 30 to which are secured the support-

ing ears 31 of the pump casing 32. Said casing comprises a piston chamber 33 and an eduction chamber 34, the latter being offset laterally from the piston chamber and preferably cast integral therewith. The body of the pump, between said chambers, is provided with two diverging conduits 35 which lead directly from the piston chamber 33, the outer ends of said conduits being closed, preferably by plugs 36. The eduction chamber communicates with said conduits 35 by means of channels 37. The bottom of chamber 33 is closed by a threaded plug 38. The pump plunger 39 is provided with a spherical socket 40 to receive the correspondingly shaped head 41 of the plunger rod 42, said rod being held in position by means of a threaded bushing 43, as shown. In this manner a universal joint is provided between the plunger 39 and the rod 42, thereby insuring a free movement of the plunger and obviating all probability of binding by reason of any lateral deflection of said rod. The upper end of the eduction chamber 34 is exteriorly threaded to receive the nipple member 44 which is provided with an eduction port 45 and a valve seat 46, the channels 37 discharging within said nipple member above the said valve seat 46. Within said chamber 34 is located the choker valve comprising a stem or shank 47 provided with a tapered portion 48 terminating in a cylindrical projection 49 adapted to fill the port 45, the end of said choker, adjacent said projection, being beveled to form a valve 50 adapted to cooperate with said valve seat 46 and thereby control the discharge of molten metal. The tapered portion 48 of the choker is provided with longitudinal grooves or channels 51. The choker is operated by one arm 52 of an angular choker-lever 53, said lever being pivotally supported by an offset portion 54 of the pump casing. The arm 52 is projected through an opening 55 formed in the wall of chamber 34, and is pivotally secured in a slot 55 formed in the shank 47.

Projecting upwardly from one edge of the metal pot 23 are arms or standards 60 provided with bearings 61 for a main rock shaft 62. Said arms or standards also serve to support a second shaft 63. Secured to the rock shaft 62 is a pump-and-choker-operating lever 64, and on the shaft 63 is mounted a pump-latch-lever 65. Said le-

vers are connected by a link rod 66, having a slot 67 to receive the pivot pin carried by a head 68 of the pump-latch-lever 65, and forked at its lower end 67' to engage the pin 5 69 mounted in the slotted end 70 of the lever 64. Said lever 65 is provided with a latch-engaging arm 71 arranged at an angle to that portion which carries the head 68. The upper end of the pump-plunger-rod is 10 secured to the head 68 at 72, and said head is held normally depressed by means of a spring 73 coiled around shaft 63 and bearing against a shoulder 74.

The arm 52 of the choker-operating lever 15 53 is provided with a latch engaging portion 75 and adjacent thereto is mounted a roller 76 which is normally engaged by a projecting cam portion 77 of the pump-and-choker-operating lever 64. The rock-shaft 20 62 is provided with an arm 78 which is connected by a pitman 79 with a crank 80 operated in any suitable manner, preferably from the main drive shaft of the machine. Mounted on the rock shaft 62 is a latch- 25 member 81 provided with two latch-arms 82, 83, the former being arranged to engage the latch-engaging portion 75 of arm 52, and the latter engaging the arm 71 of lever 65. The latch arm 82 is provided with a 30 lug or shoulder 84 adapted to be engaged by the shouldered end of an operating link 85 which is reciprocated by a suitable rock shaft 86 located on the opposite side of the metal pot. The arm or link 85 extends 5 across the top of the mold portion of the machine, thereby necessitating the disconnection thereof from the latch mechanism, before the mold parts can be lifted out, thereby rendering the molten metal mechanism inoperative before the mold can be 40 altered in any manner. In this way accidental spurts of molten metal are prevented. The link 85 is disengaged from the lug or shoulder 84 by means of an upwardly extended finger 87 carried by the 45 pump-and-choker-operating lever 64.

In Fig. 12 I have shown the crank 80 as secured on one end of the main drive shaft 90, and on said shaft is loosely mounted 50 a cam member 91 which is provided with a gear 92 driven by a suitable pinion not shown and connected with any suitable source of power, the same being substantially the structure illustrated and described in my pending application filed January 16th, 1908, Serial Number 472,680. In the present case the cam member 91 is loose 55 upon the shaft 90, and adjacent the gear 92 is placed a collar 93 secured to said shaft and provided with an arm 94, said arm in turn being provided with a curved slot arranged to receive a set screw or the like 95 carried by said gear. By this arrangement the position of the crank 80 with relation 5 to the cams carried by the member 91 can

be adjusted for the purpose of more accurately timing the operation of the various parts.

In the operation of the machine, the spring 73 tends to force the pump plunger 70 39 to its lowermost position. The latch arm 83, however, being normally in engagement with the arm 71 holds the lever 65 against the tension of said spring, thereby maintaining the pump plunger in its 75 raised position. At the same time spring 88 acting against the arm 53 normally tends to retract the choker-valve from the eduction opening 45, said opening being normally closed, however, by reason of said 80 arm 52 being held against the tension of its spring by means of the latch member 82. The operation of the parts is so timed that the latch member 82 is first disengaged from the arm 52 of the choker-lever, permitting 85 the opening of the eduction port, the valve 50 resting against seat 46 to prevent leakage around stem 47, and immediately thereafter, so soon in fact as to be almost simultaneously, the latch 83 is disengaged from 90 arm 71, permitting the spring 73 to force the pump plunger downwardly, whereupon the molten metal is ejected through the nipple opening 45. By this time the arm 78 has rocked the shaft 62, and as a result, the 95 headed end 68 of lever 65 is raised by means of rod 66, thereby raising the pump plunger and bringing the arm 71 back into position to be engaged by the latch member 83, the latter being rocked at the proper time 100 to effect such engagement. As the lever 65 moves upwardly, the cam portion 77 thereof engages the roller 76, rocking the lever 53 in a direction to close the port or opening 45, and bringing the said lever into engage- 105 ment with the latch-member 82. In this connection it will be noted that the upward movement of lever 64 brings the finger 87 against the underside of link 85, raising the latter out of engagement with the latch- 110 lever 81, whereby the latter will be free to return to the engaging position.

In Fig. 11 I have shown a modification of the pump. This form embodies a pump casing 32' provided with a piston chamber 115 33' and an eduction chamber 34', said chambers being connected by conduits 35'. The pump plunger may be of any suitable or preferred structure, and is not illustrated. Within the eduction chamber 34' is located 120 a choker valve provided with a stem 47' having at its lower end a valve 48' adapted to rest upon a seat 49'. A movable collar 50' is also mounted on said stem and held normally against a stop pin 51' by means of 125 a spring 52'. The valve seat 49' is arranged at the end of an induction passage 53' formed in the bottom of the casing 32' opposite chamber 34', said passage communicating with the conduit 35'. The bore of 130

the eduction chamber 34' is cut away as indicated at 54' to permit free passage of the molten metal. Eduction channels 55' are provided to conduct the molten metal from the conduit 35' to the nipple chamber 36'. The bottom of the piston chamber 33' is closed by a suitable plug 56'. In operation, the parts are so timed that as the pump plunger ascends the valve 48' is raised permitting the metal to flow through passage 51' into the conduit 35', the nipple being closed in the usual manner. When the plunger descends, the valve 48' closes the passage 53' and the molten metal flows through the channels 55' to the nipple, where it is discharged. In this manner, an efficient pump is provided, the same being constructed to take the molten metal in at a low level.

I claim as my invention:—

1. Molten metal mechanism for type casting machines comprising a pump provided with a plunger and a plunger rod, a pivoted member, means for pivotally connecting said plunger rod with said pivoted member, a spring acting on said pivoted member, means for moving said pivoted member in opposition to said spring, locking means adapted to engage said pivoted member after such movement, and means for periodically disconnecting said pivoted member and its locking means, whereby the plunger will be operated.

2. Molten metal mechanism for type casting machines comprising a pump provided with a plunger and a plunger rod, a pivoted latch member, means for pivotally connecting said plunger rod with one end of said latch member, a spring acting on said latch member, means for engaging the free end of said latch member to hold the plunger normally retracted in opposition to said spring, and means for periodically disengaging said latch member from its holding means, whereby the plunger will be operated.

3. Molten metal mechanism for type casting machines comprising a pump provided with a plunger and a plunger rod, a pivoted latch member, means for pivotally connecting said plunger rod with one end of said latch member, a spring acting on said latch member, a pivoted latch for engaging said latch member to hold the plunger normally retracted in opposition to said spring, and means for periodically disengaging said latch from said latch member, whereby the plunger will be operated.

4. Molten metal mechanism for type casting machines comprising a pump provided with a plunger and a plunger rod, a rock shaft, a latch member secured thereto, connections between said latch member and said plunger, a spring encircling said rock shaft, means for engaging said latch member to hold said plunger normally retracted in op-

position to said spring, and means for periodically disengaging said latch member and its holding means, whereby the plunger will be operated.

5. Molten metal mechanism for type casting machines comprising a pump provided with a plunger and a plunger rod, a pivoted member, means for pivotally connecting said plunger rod with said pivoted member, a spring acting on said member, a rock shaft, a latch carried thereby adapted to engage said pivoted member, and means for periodically operating said rock shaft to disengage said latch, whereby the plunger will be operated.

6. Molten metal mechanism for type casting machines comprising a pump, a plunger for ejecting molten metal from said pump, means for exerting a constant pressure upon said plunger, means for holding the plunger normally retracted in opposition to said pressure, means for periodically releasing said plunger, and independent means for moving said plunger to reengage said holding means.

7. Molten metal mechanism for type casting machines comprising a pump, a plunger for ejecting molten metal from said pump, a spring actuated latch lever connected with said plunger, means for holding said lever normally retracted in opposition to the spring pressure, means for periodically releasing said latch lever, and independent means for moving said latch lever to reengage said holding means.

8. Molten metal mechanism for type casting machines comprising a pump, a plunger for ejecting molten metal from said pump, a spring actuated latch lever connected with said plunger, a latch member for engaging said latch lever, means for periodically disengaging said latch member from said lever, and means for moving said latch lever to reengage said latch.

9. Molten metal mechanism for type casting machines comprising pump mechanism including a reciprocating choker valve, a choker lever, a spring acting on said lever to unseat said valve, means for moving said lever in opposition to the spring pressure, locking means adapted to engage said lever after such movement, and means for periodically disengaging said locking means from said lever, whereby the choker valve is operated.

10. Molten metal mechanism for type casting machines comprising pump mechanism including a reciprocating choker valve, a choker lever, a spring acting on said lever to unseat said valve, a latch member adapted to engage said lever to hold the same retracted, and means for periodically moving said latch member to free said lever.

11. Molten metal mechanism for type casting machines comprising pump mechanism

including a reciprocating choker valve, a choker lever, a spring acting on said lever to unseat said valve, means for holding said lever normally retracted in opposition to the spring pressure, means for periodically operating said holding means to free said choker lever, and means for automatically moving said choker lever to reengage said holding means.

12. Molten metal mechanism for type casting machines comprising pump mechanism including a choker valve, a spring actuated choker lever, a latch member adapted to engage said lever to hold the same normally retracted, means for periodically disengaging said latch member from said lever, and independent means for moving said lever to reengage said latch member.

13. Molten metal mechanism for type casting machines comprising pump mechanism including a choker valve, a spring actuated choker lever, means for holding said lever normally retracted in opposition to the spring pressure, means for periodically disengaging said latch lever, and a cam member adapted to move said lever to reengage said holding means.

14. Molten metal mechanism for type casting machines comprising pump mechanism including a choker valve, a spring actuated choker lever, a latch member adapted to hold said lever normally retracted, means for periodically disengaging said latch member from said lever, and a cam member adapted to move said lever to reengage said latch member.

15. Molten metal mechanism for type casting machines comprising pump mechanism including a pump plunger and a choker valve, a spring actuated latch lever connected with said plunger, a spring actuated choker lever connected with said choker valve, a latch member provided with arms engaging said latch lever and said choker lever, and means for actuating said latch member to successively disengage the latch arms from said choker lever and said latch lever.

16. Molten metal mechanism for type casting machines comprising pump mechanism including a pump plunger and a choker valve, a spring actuated latch lever connected with said plunger, a spring actuated choker lever connected with said choker valve, a latch member provided with arms for engaging said latch lever and said choker lever, means for actuating said latch member to successively release said choker lever and said latch lever, and means for moving said choker lever and said latch lever to reengage said latch member.

17. Molten metal mechanism for type casting machines comprising pump mechanism including a pump plunger and a choker valve, a spring actuated latch lever con-

nected with said plunger, a spring actuated choker lever connected with said choker valve, means for holding said levers normally retracted, means for successively disengaging said choker lever and said latch lever, a rock shaft, and an arm carried by said rock shaft provided with means for moving said levers to reengage with their respective holding means.

18. Molten metal mechanism for type casting machines comprising pump mechanism including a pump plunger and a choker valve, a spring actuated latch lever connected with said plunger, a spring actuated choker lever connected with said choker valve, a latch member provided with arms engaging said latch lever and said choker lever, means for actuating said latch member to successively disengage said arms from said choker lever and said latch lever, a rock shaft, and an arm carried by said rock shaft for moving said latch lever and said choker lever to reengage said latch arms.

19. Molten metal mechanism for type casting machines comprising pump mechanism including a pump plunger and a choker valve, a spring actuated latch lever connected with said plunger, a spring actuated choker lever connected with said choker valve, means for holding said levers normally retracted, means for successively disengaging said choker lever and said latch lever from said holding means, a rock shaft, and an arm carried by said rock shaft and connected with said latch lever, said arm being also provided with means for engaging said choker lever.

20. Molten metal mechanism for type casting machines comprising pump mechanism including a pump plunger and a choker valve, a spring actuated latch lever connected with said plunger, a spring actuated choker lever connected with said choker valve, means for holding said levers normally retracted, means for successively disengaging said choker lever and said latch lever from said holding means, a rock shaft, and an arm carried by said rock shaft and connected with said latch lever, said arm being provided with an elbow adapted to engage said choker lever.

21. Molten metal mechanism for type casting machines comprising pump mechanism including a pump plunger and a choker valve, a spring actuated latch lever connected with said plunger, a spring actuated choker lever connected with said choker valve, a latch member provided with arms engaging said choker valve, a latch member provided with arms engaging said latch lever and said choker lever, means for actuating said latch member to successively disengage said arms from said choker lever and said latch lever, a rock shaft, and an arm carried by said rock shaft and con-

connected with said latch lever, said arm being provided with means for engaging said choker lever.

22. Molten metal mechanism for type casting machines comprising pump mechanism including a pump plunger and a choker valve, a rock shaft, means for operating said rock shaft, and means carried by said rock shaft for successively actuating said plunger and valve.

23. Molten metal mechanism for type casting machines, comprising pump mechanism including a pump plunger and a reciprocatory choker valve, a rock shaft, means carried by said rock shaft for actuating said plunger and valve, a crank shaft, and means operated by said crank shaft for actuating said rock shaft.

24. Molten metal mechanism for type casting machines comprising pump mechanism including a pump plunger and a choker valve, a rock shaft, means carried by said rock shaft for actuating said plunger and valve, an arm secured to said rock shaft, a crank shaft, and a pitman connecting said crank shaft and said arm.

25. The combination with a mold base adapted to support mold mechanism, of pump mechanism, means for actuating said pump mechanism, a latch member controlling the operation of said pump mechanism, and an operating arm for said latch member extended across the top of said mold base.

26. In molten metal mechanism for type casting machines a pump casing provided with a piston chamber and an eduction chamber, the latter being offset laterally from the former, said casing being provided with diverging conduits leading from the piston chamber to opposite points in the eduction chamber.

27. In molten metal mechanism for type casting machines a pump casing provided with a piston chamber and an eduction

chamber, said casing being provided with an offset portion, a plunger working in said piston chamber, a choker valve in said eduction chamber, a choker lever pivotally mounted in the offset portion of said pump casing, and means for actuating said lever and said plunger.

28. Molten metal mechanism for type casting machines, comprising pump mechanism including a pump plunger and a choker valve, a rock shaft, means carried by said rock shaft for actuating said plunger and valve, a drive shaft, a crank mounted thereon, means operated by said crank for actuating said rock shaft, and means for adjusting the throw of said crank.

29. Molten metal mechanism for type casting machines, comprising pump mechanism including a pump plunger and a choker valve, a rock shaft, means carried by said rock shaft for actuating said plunger and valve, a drive shaft, a crank mounted thereon for actuating said rock shaft, a gear for driving said drive shaft, and means for turning said drive shaft independently of said gear to adjust the throw of said crank.

30. Molten metal mechanism for type casting machines, comprising pump mechanism including a pump plunger and a choker valve, a rock shaft, means carried by said rock shaft for actuating said plunger and valve, a drive shaft, a crank mounted thereon for actuating said rock shaft, a gear loosely mounted on said drive shaft, a collar secured to said drive shaft, and means for adjustably securing said collar to said gear.

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

ANDREW E. MILLER.

Witnesses:

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WALBER P. HALSTOR.