J. J. WALSER.

STEREOTYPE PLATE CASTING MECHANISM.

APPLICATION FILED JAN. 9, 1909.

945,826. Patented Jan. 11, 1910.

5 SHEETS—SHEET 1.

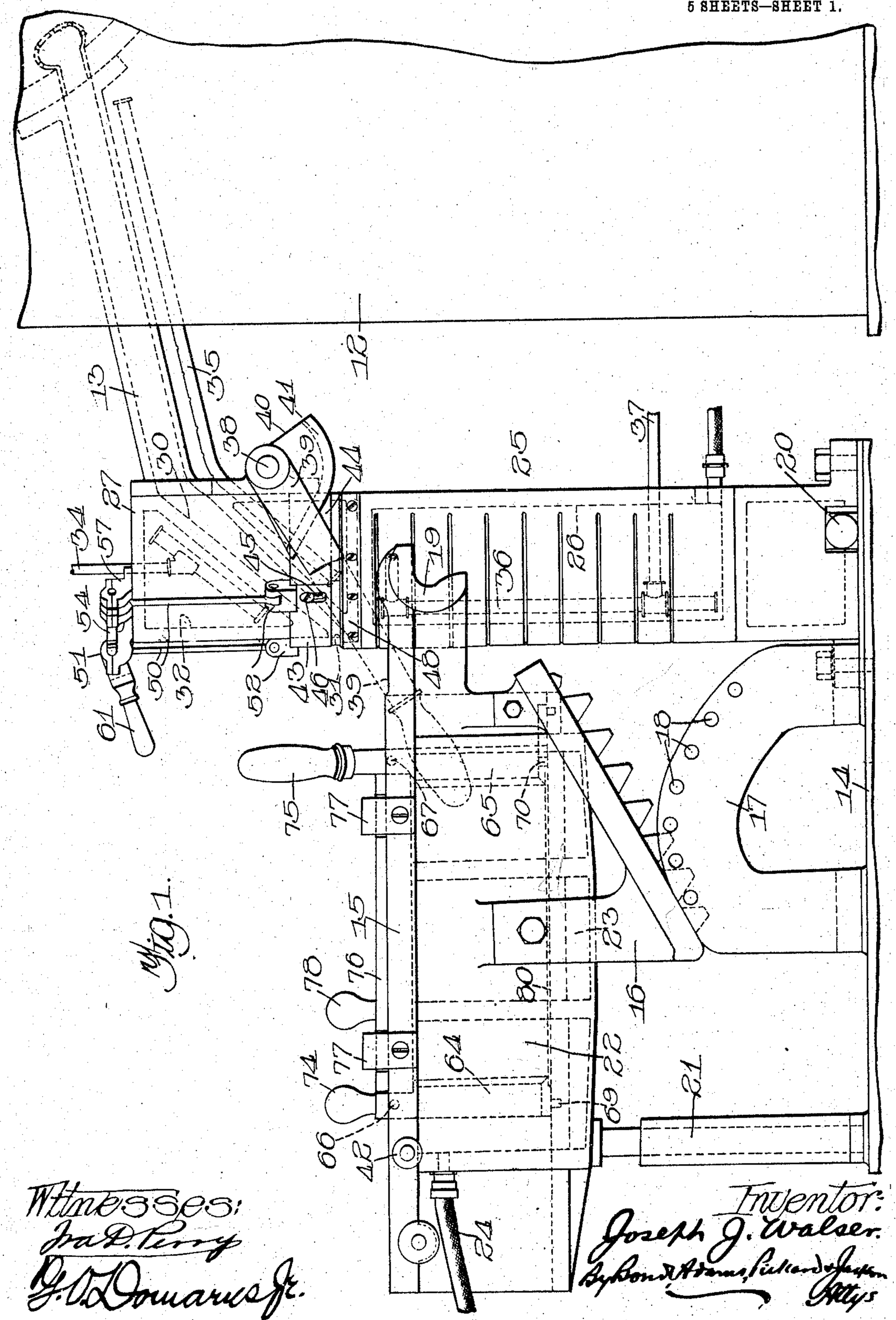

Fig. 1.

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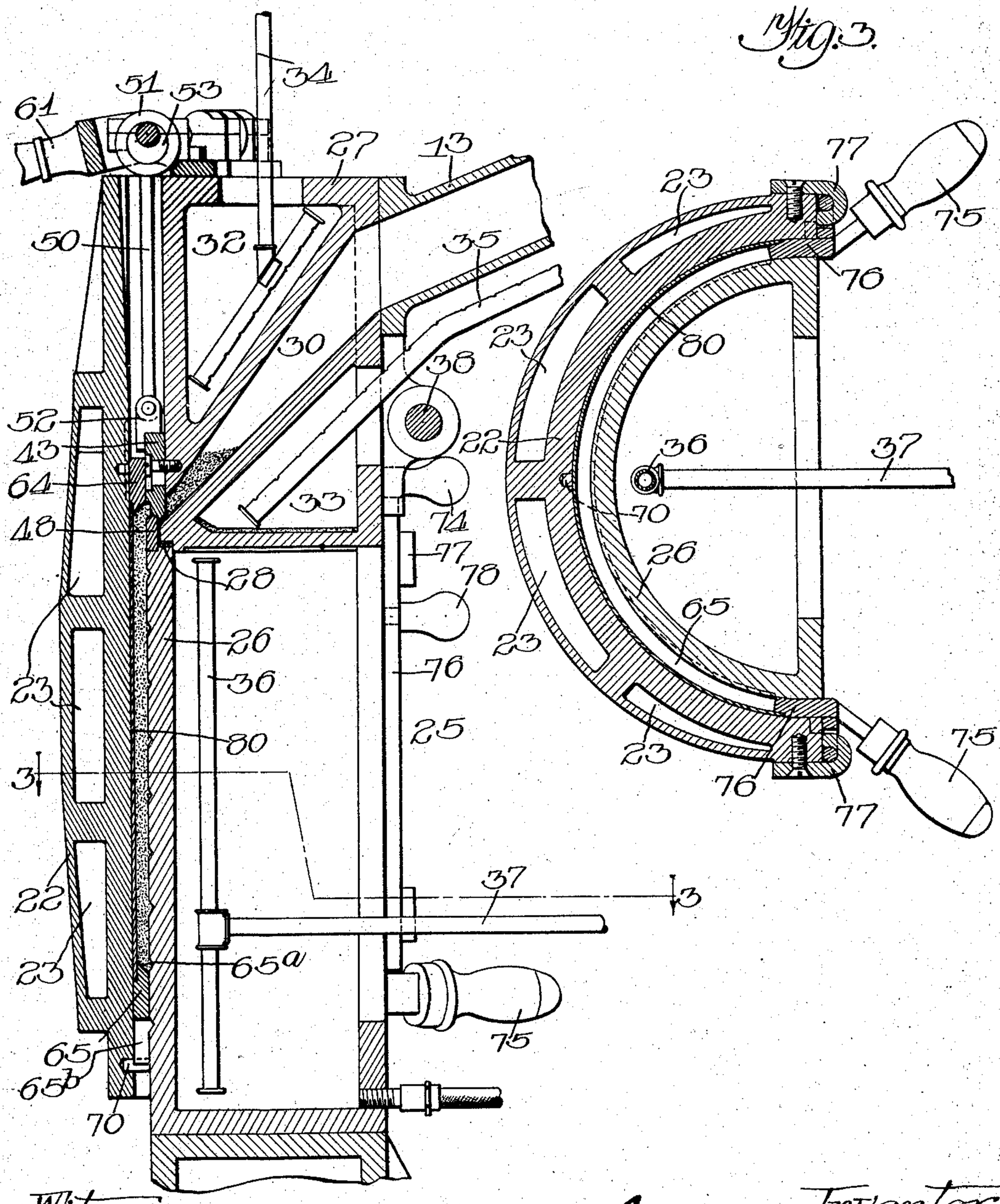
Fig. 2.

Fig. 3.



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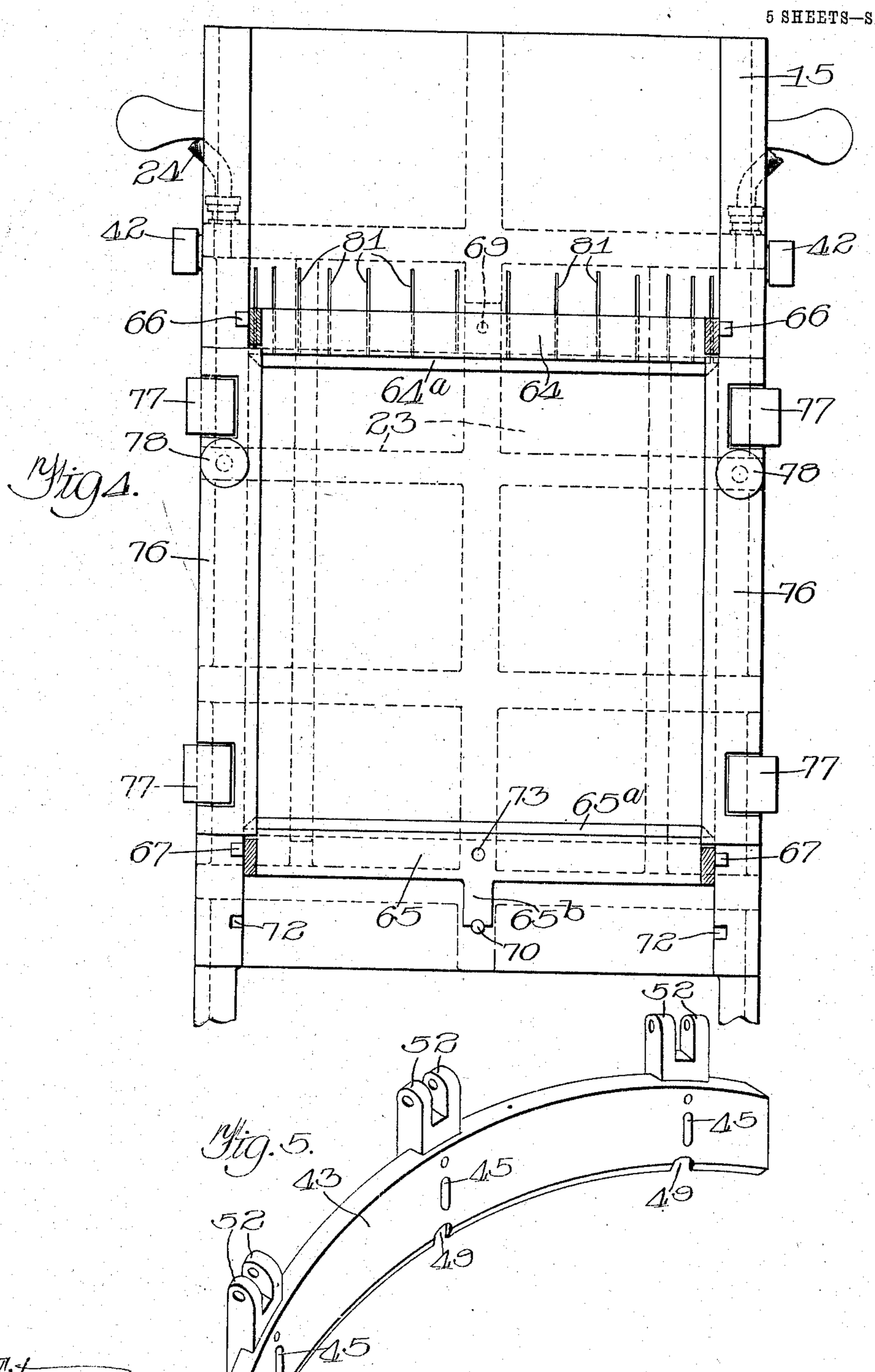

Fig. 1.

Fig. 5.

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Fig. 6.

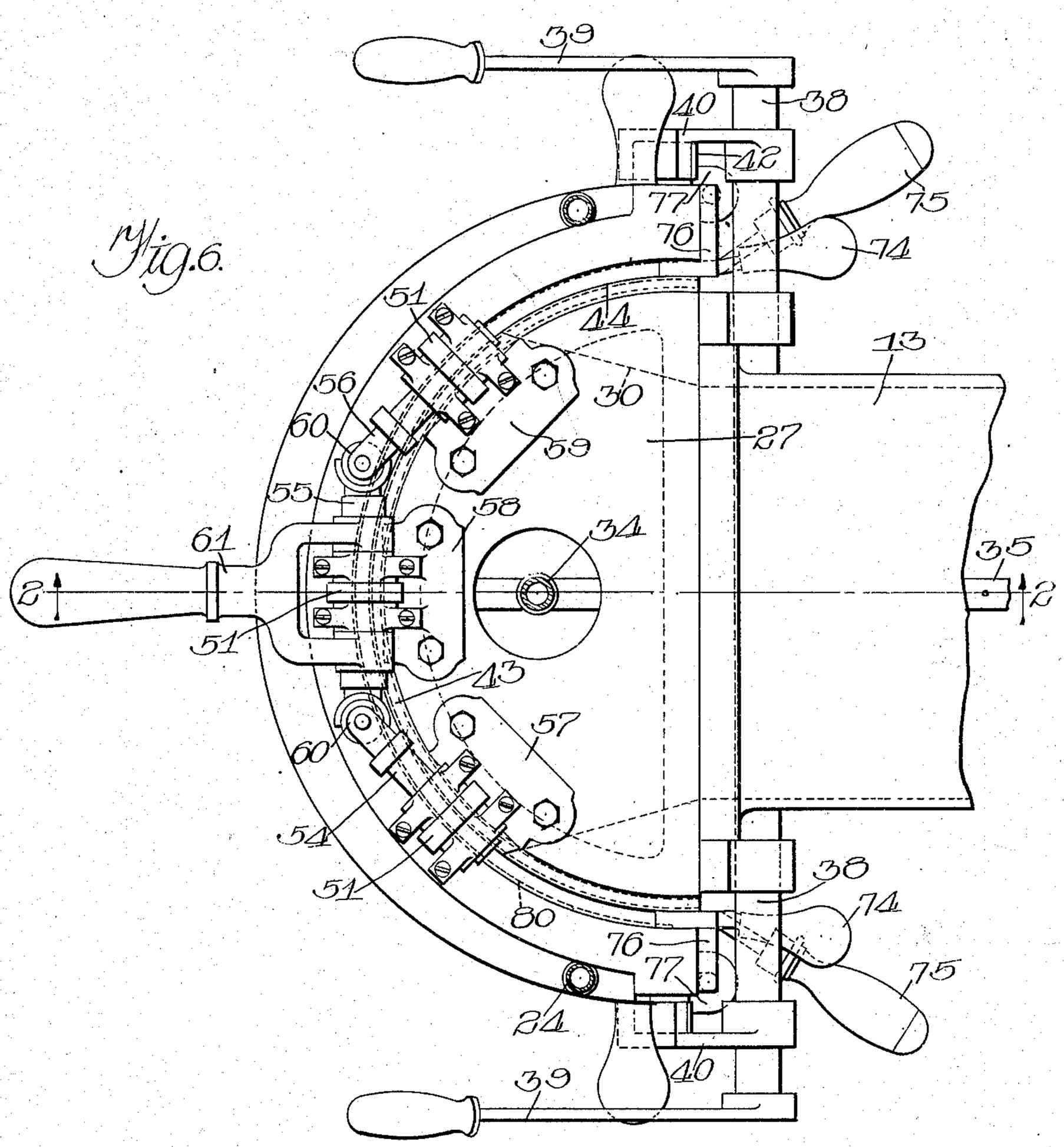

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Fig. 8.

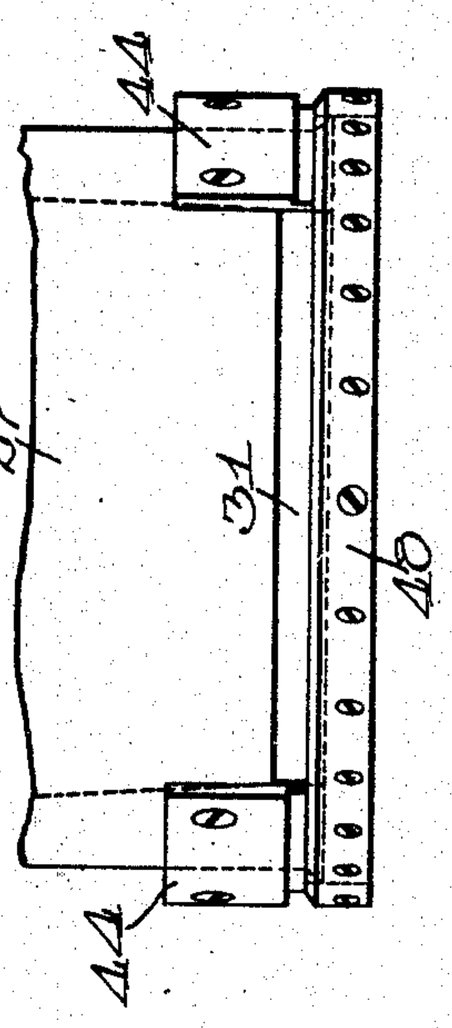

Fig. 10.

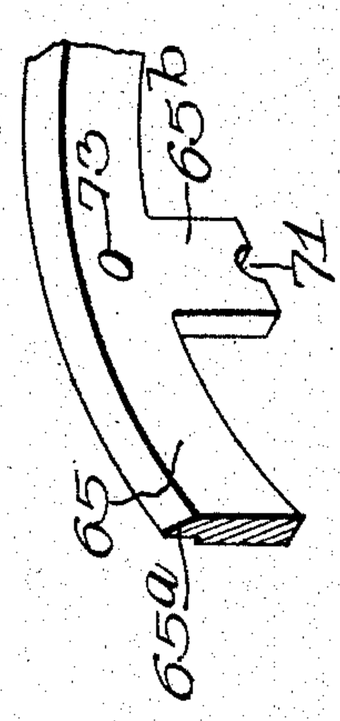

Fig. 9.

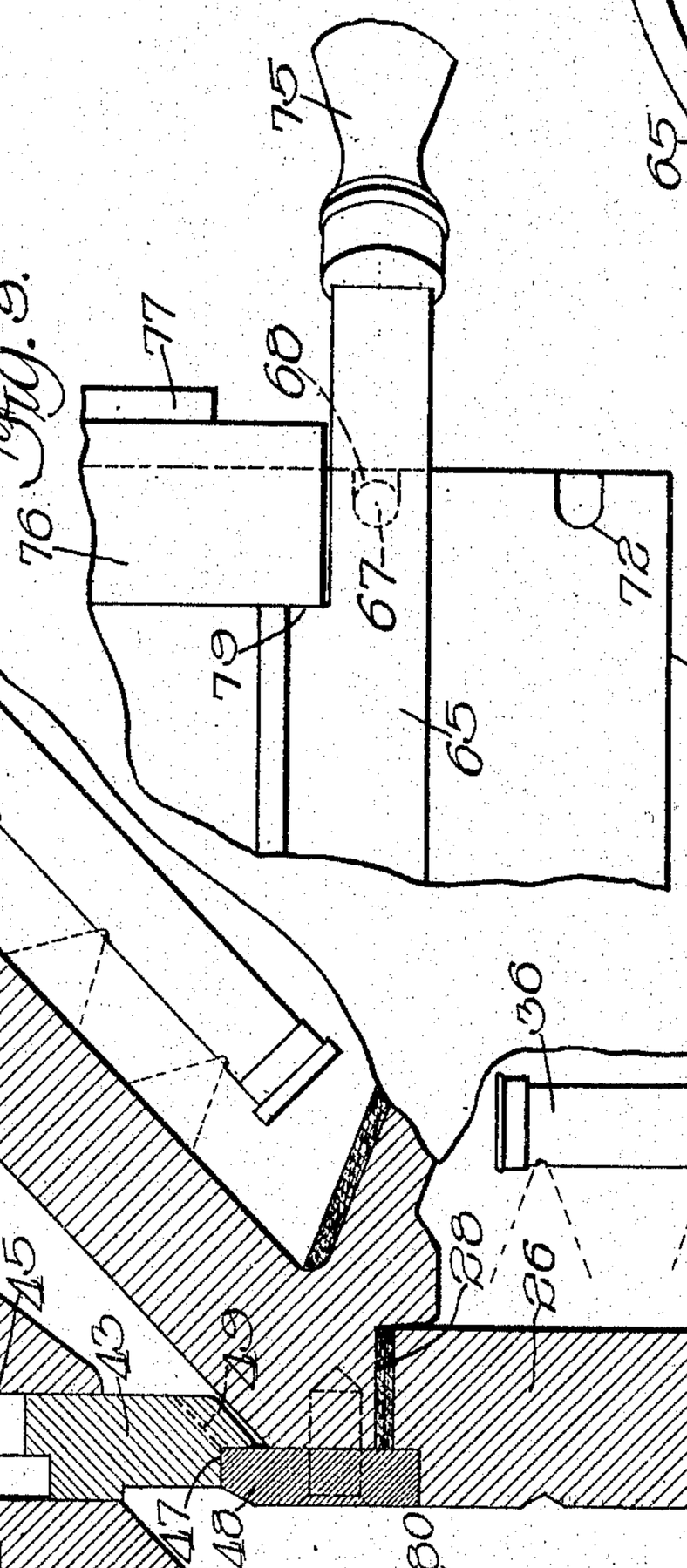

Fig. 7.

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JOSEPH J. WALSER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE GOSS PRINTING PRESS COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

STEREOTYPE-PLATE-CASTING MECHANISM.

945,826. Specification of Letters Patent. **Patented Jan. 11, 1910.**

Application filed January 9, 1909. Serial No. 471,450.

To all whom it may concern:

Be it known that I, JOSEPH J. WALSER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Stereotype-Plate-Casting Mechanism, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to stereotype-plate casting mechanism, and its object is to provide a new and improved mechanism for casting stereotype plates which will enable the plates to be cast without risers or "tails", thereby doing away with the necessity for the use of tail-cutting mechanism.

It has for a further object to provide mechanism of that character in which the casting chamber may be filled from the top without the use of pumps or other complicated machinery.

It has for a further object the improvement of such mechanism in sundry details hereinafter pointed out.

In the accompanying drawings,—Figure 1 is a side elevation; Fig. 2 is a vertical section at line 2—2 of Fig. 6 through the casting-box with its two parts brought together in casting position; Fig. 3 is a section on line 3—3 of Fig. 4; Fig. 4 is a somewhat enlarged detail, being a top or plan view of the drag or movable member of the casting-box; Fig. 5 is an enlarged detail, being an isometric view of the cutting-knife; Fig. 6 is an enlarged detail, being a top or plan view of the casting-box and a part of the discharge spout of the melting-pot; Fig. 7 is an enlarged detail, being a section through a part of the upper portion of the casting-box to show particularly the knife valve and its operation; Fig. 8 is a detail, being a view of the bottom portion of the upper part of the plunger or stationary member seen from the convex side; Fig. 9 is an enlarged detail of one corner of the bottom of the drag or movable member viewed from within; and Fig. 10 is an enlarged detail, being a view of a portion of the bottom gages.

Referring to the drawings,—12 indicates a melting-pot of any well-known form and description provided with a discharge-spout 13.

14 indicates a bed-plate adjacent to the melting-pot 12 and upon which the members of the casting-box proper are mounted.

15 indicates the movable member or drag of the casting-box, which, by means of racks 16 secured upon its sides and curved supports 17 containing rack-bars 18 adapted to engage the racks 16, may be swung into position upon the vertically-disposed stationary member or plunger and is provided with sockets 19 which, when the drag is moved into casting position engage studs 20 upon each side of the bottom of the plunger.

21 indicates a supporting-post on the base 14 which supports the drag in horizontal position, as shown in Fig. 1.

The portion of the drag which surrounds the casting chamber is provided with a jacket 22 which is preferably formed integral therewith with suitable openings 23 and into which by means of a by-pass 24 cold water from any suitable source of supply may be fed for the purpose of cooling the drag.

25 indicates a fixed member or plunger, which is formed of two parts, a lower portion 26 which forms the convex side of the casting chamber in the usual manner, and an upper portion 27 fastened to the top of the lower portion 26 and provided with asbestos packing 28 between its convex outer edge, which is concentric with the curve of the casting chamber, and the top of the curved portion 26 of the drag. Inasmuch as the heat is constantly applied so that molten metal is always contained in the upper part of the casting-box, this packing is arranged to prevent as far as possible the radiation of the heat from the upper portion of that part of the plunger which with the drag forms the casting chamber proper. The top or movable member is provided with a discharge opening 30 which opens at its upper end into the discharge pipe 13 of the furnace and, extending downwardly and outwardly toward the convex surface, discharges through a passage 31 (see Fig. 8) at the bottom of the upper member 27 which is above the top of the lower member 26, so that when the parts are in position the discharge opening 31 comes at the top of the casting chamber formed by the plunger and drag. The upper portion 27 is further provided with interior chambers 32—33 so as to form relatively thin walls between said chambers and the discharge spout 30.

34—35 indicate gas-burner tubes which lead, respectively, into the chambers 32—33

and by means of which the discharge opening 30 and the discharge pipe 13 may be constantly heated so that the metal therein will be constantly kept in a molten condition.

36 indicates a water pipe to which water may be conveyed from any suitable source, as through a supply tube 37, and from which the water may be sprayed in any suitable manner upon the interior of the lower portion of the plunger so as to keep the same cool.

38 indicates rock-shafts journaled upon the back of the upper portion 27 of the plunger and operated by hand-levers 39.

40 indicates plates secured to the rock-shafts and having cam-flanges 41 which project inward therefrom and are adapted when the drag is rocked into position on the plunger to engage rollers 42 and lock the drag firmly against the plunger when the levers are swung upward from the position shown in Fig. 1.

43 indicates a knife-valve curved so as to fit against the lower convex surface of the upper member 27 of the plunger between guides 44 best shown in Figs. 1 and 8. The knives are slidingly held in position upon the member 27 by means of slots 45 in said knife-valve through which pass suitable screws or bolts 46 whose heads are suitably countersunk, as is best shown in Fig. 7, so as to permit the valve to slide between the convex surface of the member 27 and the concave surface of the head-gage on the drag hereinafter described. Inasmuch as the opening 30, as has been said, is continuously full of molten metal, in order to prevent the knife 44 from bending under the pressure when heated and getting out of shape and thereby failing to close the opening, the knife is made thicker than usual and is provided upon its convex surface at its lower end with a circumferential rabbet 47 forming a shoulder which, when the knife-valve is lowered, comes in contact with and engages the upper surface of a curved stop 48 which is screwed, or otherwise suitably secured, upon the convex side of the member 27 at its lower edge and whose upper edge extends upward above the bottom of the discharge opening 31. This curved stop 48, it will be seen, engaging the circumferential rabbet on the lower edge of the concave side of the knife-valve when the said knife-valve is closed, forms, it will be seen, a brace or support which prevents the knife from being bent when heated and pressed outward by the weight of molten material behind it. 49 indicates curved recesses in the lower edge of the knife-valve 43 and of a depth equal to the vertical height of the rabbet 47, thereby permitting the metal which would lie between the lower edge of the knife and the upper surface of the stop 48 as soon as the lower edge of the knife comes in contact with the inner curved edge of the guide to escape through said openings back into the discharge opening 30. The knife is preferably reciprocated by means of eccentric rods 50 having straps or rings 51 at their upper ends and pivotally connected at their lower ends with lugs 52 on said knife. The eccentric rods 50 are operated by eccentrics 53 on shafts 54—55—56 which are journaled in suitable bearings 57—58—59 on the top of the member 27. The shafts 54 and 56 are connected by universal joints 60 with the ends of the shaft 55 which is rocked by a hand-lever 61 secured thereto. It will be obvious that by operating the hand-lever and rocking the shafts 54—55—56 the eccentric rods 50 will be moved to raise and lower the knife-valve 43 so as to permit the metal to flow into the casting chamber formed between the drag and plunger when in position and to shut said opening off when the casting chamber is filled.

Referring particularly to Figs. 3, 4 and 9, 64—65 indicate, respectively, top and bottom gages which are curved to fit the interior of the drag and are provided with the usual beveled edges 64^a—65^a. The head and foot gages are held in position by means of pins 66—67 which enter suitable slots, as 68 in Fig. 9, on the edge of the box. The head-gage 64 is further held in position by means of a pin 69 in the longitudinal center of the curved surface of the drag which enters a suitable opening in the head-gage 64. The foot-gage 65 is further held in position by means of a pin 70 which projects from the central longitudinal convex surface of the drag and engages a recess 71 at the end of an extension 65^b of the foot-gage 65. In order that the foot-gage may be adjustable to secure to a greater width of plate other slots are provided in the edges of the chamber, farther out upon the edges of the drag, into which the pins 67 may enter, and the knife 65 is provided with an opening 73 which is adapted to engage the pin 70. Other slots, of course, may be provided for further adjustment if desired. The head-gages 64 are provided with handles 74 and the foot-gages with handles 75 by means of which they may be removed from the box.

Referring to Figs. 3 and 4, where they are best shown, 76 indicates side gages which, as is best shown in Fig. 3, are hinged to the edges of the drag by means of bearings 77 whereby by means of handles 78 they may be swung into the position shown in Fig. 3 or out of the way when it is desired to remove the matrix. When in the position shown in Figs. 3 and 4, the inner ends of the side gages 76 abut upon suitable shoulders on the head and foot gages, as 79 in Fig. 9, and both the side, head and foot gages are suitably rabbeted to receive the

edges of the matrix when the same is in position, as shown in Fig. 3. The head, bottom and side gages are, of course, of a thickness corresponding with that of the plate to be cast so that when the drag is brought against the plunger into position for casting and locked against it by the mechanism above described the inner surfaces of said gages will be brought tightly against the convex surface of the plunger and a metal-tight chamber thus formed between the plunger and the drag of the shape and size of the plate to be cast. In order to afford the air a chance to escape from behind the matrix as the space is being filled I provide a series of grooves 81 (see Figs. 4 and 7) in the inner surface of the chamber, whose lower ends extend to the bottom of the upper gage 64 when the same is in position, and whose upper ends extend a suitable distance above it.

The operation will be readily understood from the above. The parts being in the position shown in Fig. 1, and the head and foot gages removed and the side gages moving out of the way, the matrix is placed in position on the drag and the gages put in proper position to hold the matrix therein. The drag is thereupon rocked into vertical position against the plunger with the sockets 19 engaging the bearings 20. By the movement of the levers 39 the drag is thereupon locked firmly against the plunger so as to form the metal-tight casting chamber for the plate. In this position, as is best shown in Fig. 2, the lower beveled edge of the head-gage 64 is just above the top of the discharge opening. By means of the lever 61 the knife-valve is thereupon raised and the molten metal passes into the casting chamber until the same is filled, the air behind the matrix expanding and escaping through the grooves 81. When the chamber is full, the valve is lowered, closing the discharge orifice. When, by means of the usual sprinkler in the drag and plunger, the plates are cooled and the metal in the casting chamber set, the parts are unlocked by the contrary operation of the levers 39, the matrix is rocked in a horizontal position and the plates removed in the usual manner by swinging the side gages out of the way and removing the head and foot gages.

The advantages of the construction shown and described, in having the opening into which the molten metal comes from the melting pot at the top of the casting-chamber, and in providing a cut-off bar or knife-valve to operate across said opening, and so constructed that its exterior surface, when moved across the opening, forms a portion of the casting-chamber, are several. The having the opening into which the metal comes at the very top of the chamber instead of at the bottom enables the metal, as it comes in, to displace the air upward,—the air being forced out through the incoming molten metal and out through the discharge opening. This does away with the necessity of providing the upper end of the casting-chamber with a number of openings for the air to pass through on its way out of the chamber, as is necessary in constructions in which the molten metal is introduced at the bottom of the chamber. Such openings in the top edge or head-gage of the chamber, when the chamber is filled, permit the molten metal to rise into the openings, forming a number of little projections which have to be trimmed off when the plate is removed. With my construction, however, this difficulty is removed, and the position of the opening, taken in connection with the fact that the cut-off knife when closed across said opening is so shaped that its exterior surface forms a portion of the casting-chamber, enables me to cast a complete stereotype plate ready to be placed into a machine after undergoing only the shaving operation, and without the necessity of any trimming of the edges to form the proper bevels, or, at least, rendering only very slight trimming necessary.

That which I claim as my invention, and desire to secure by Letters Patent, is,—

1. In a casting box for stereotype plates, the combination of a drag and plunger adapted when placed in operative relation with each other to form a casting chamber and provided with a passage for molten metal opening into said chamber, of a bar extending longitudinally of said opening and having its upper edge extending partially over said opening, and a valve adapted to be moved to close said opening and when so closed to be brought into engagement with said bar and having its outer surface adapted when closed to form a portion of the casting chamber.

2. In a stereotype-plate casting box, the combination with a plunger and a movable drag adapted to be moved into operative relation with said plunger to form a casting chamber for stereotype plates between them, of a top member on said plunger, a spout for molten metal arranged in said top member and having a discharge opening at its lower end in the form of a slot at the top of said casting chamber, means for keeping the metal in said spout in molten condition, a brace-bar extending from end to end of said discharge slot and having its top edge above the lower edge of said discharge slot, and a valve slidingly carried on said top member and adapted when lowered to separate the molten metal from the casting chamber and to engage said brace-bar.

3. In a stereotype-plate casting box, the combination with a plunger, and a movable drag adapted to be moved into operative re-

lation with said plunger to form a casting chamber for the stereotype plates between them, of a top member on said plunger, a spout for molten metal arranged in said top member and having a discharge opening at its lower end in the form of a slot at the top of said casting chamber, means for keeping the metal in said spout in molten condition, a brace-bar extending from end to end of said discharge slot and having its top edge above the lower edge of said discharge slot and having its outer surface shaped to conform to and form a portion of the top part of the casting chamber, and a valve, slidingly mounted on said upper member, and having its outer surface adapted, when lowered to shut off metal, to form a portion of the top of said casting chamber opposite said discharge opening and provided with a longitudinal rabbet at its lower edge adapted to engage said brace-bar when said valve is lowered to shut off the metal.

4. A valve for stereotype-plate casting box consisting of a strip longitudinally rabbeted on its lower surface and provided with one or more openings extending from its edge upward through said rabbeted portion.

5. In a casting-box for stereotype plates, the combination of a drag and plunger adapted when placed in operative relation with each other to form a casting chamber and provided with a passage for molten metal opening into said chamber, of a bar extending longitudinally of said opening and having its upper edge above the lower edge of said opening, and a valve adapted to be moved to close said opening and provided on its outer surface with a longitudinal rabbet adapted to engage the upper edge of said bar and with one or more slots extending from its lower edge upward through said rabbeted portion.

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