No. 756,325. PATENTED APR. 5, 1904.

C. F. BROOKER.

ROD CASTING MACHINE.

NO MODEL. APPLICATION FILED AUG. 10, 1903.

3 SHEETS—SHEET 1.

FIG. 1.

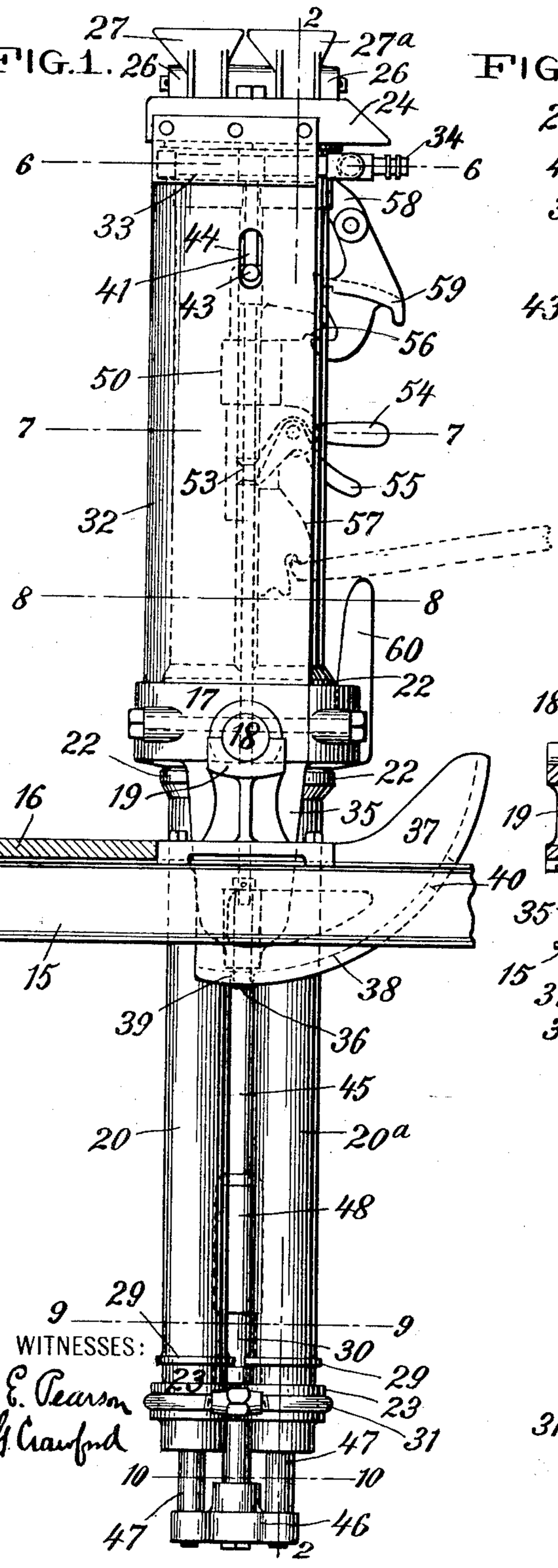
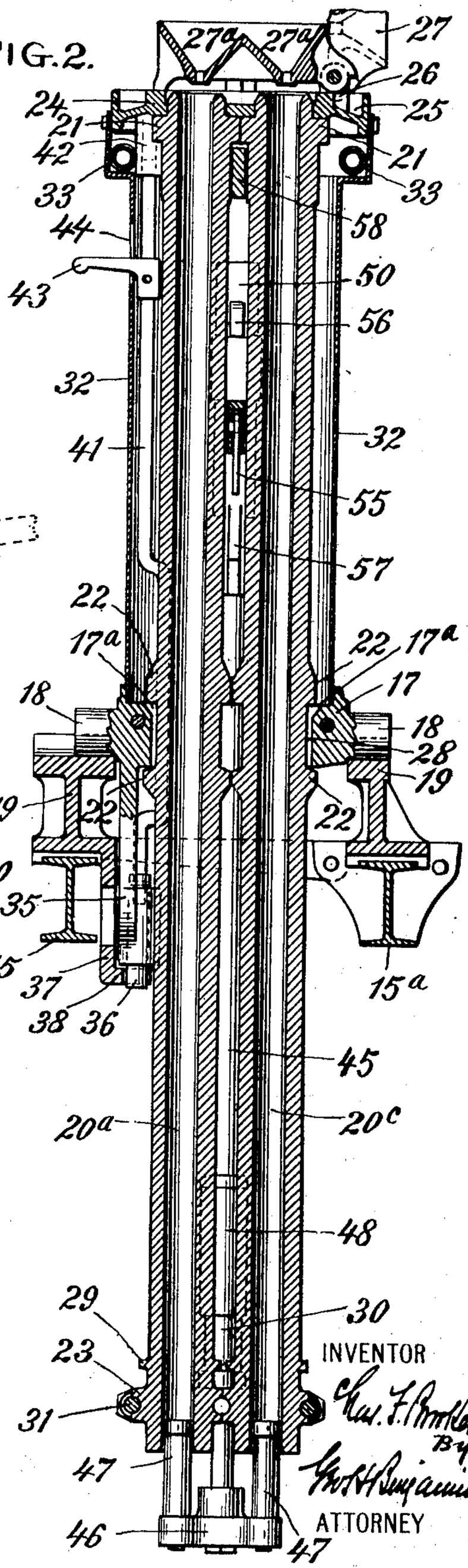


FIG. 2.



WITNESSES:

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3 SHEETS—SHEET 2.

FIG. 3.

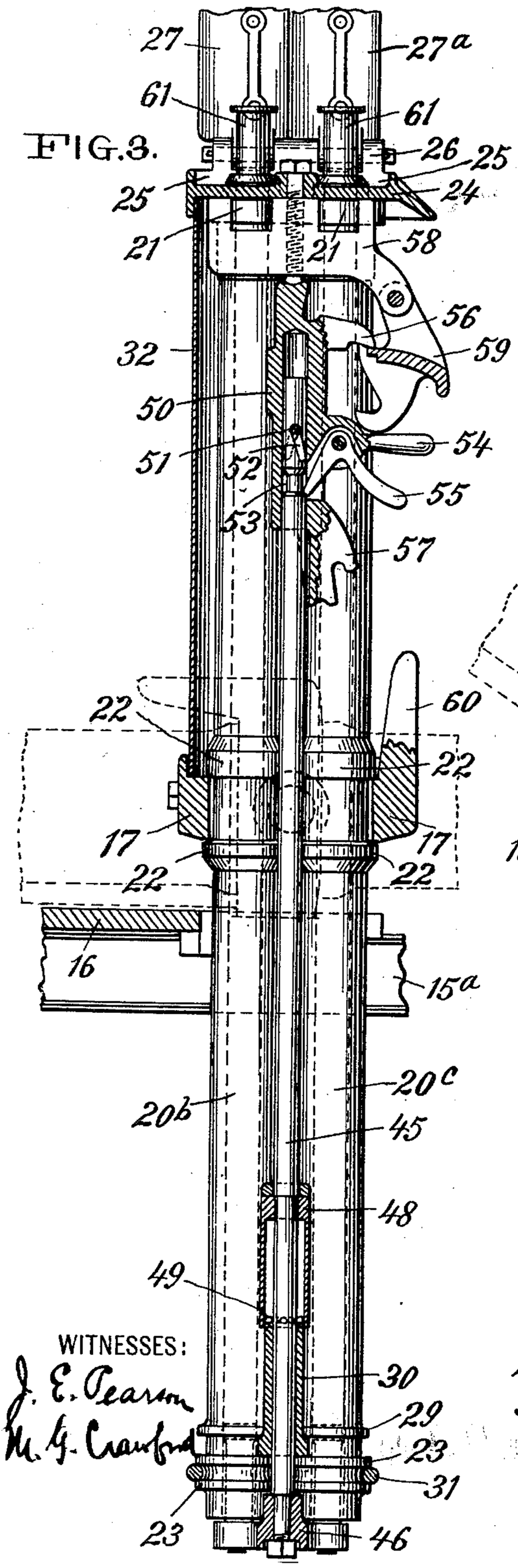
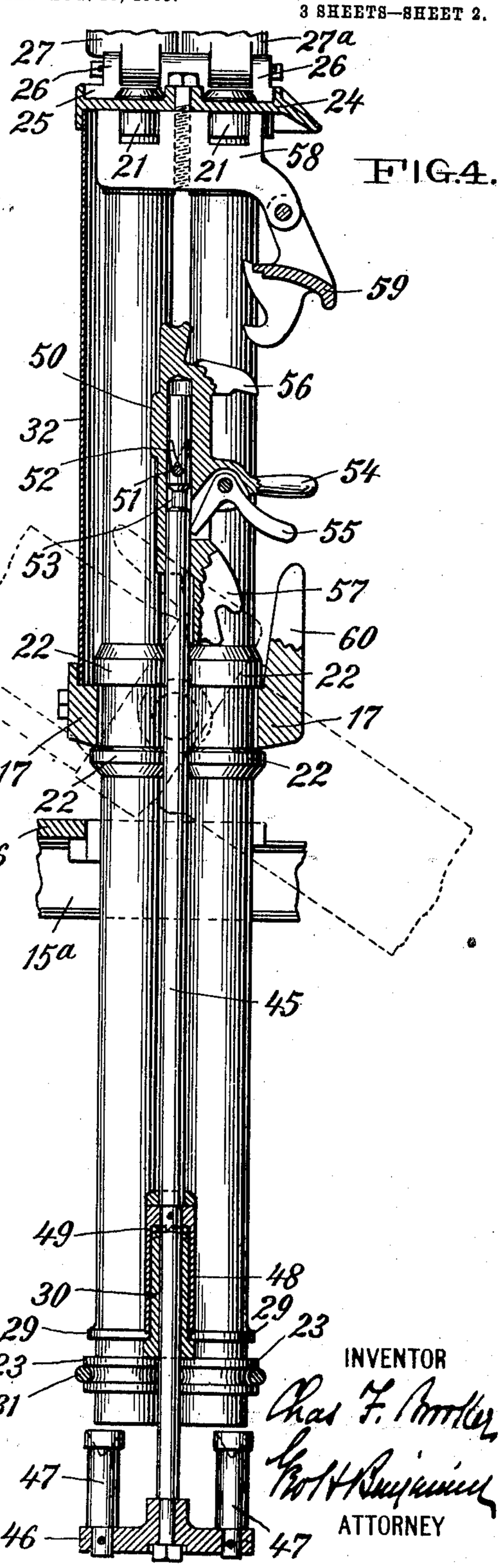


FIG. 4.



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APPLICATION FILED AUG. 10, 1903.

NO MODEL. 3 SHEETS—SHEET 3.

FIG. 5.

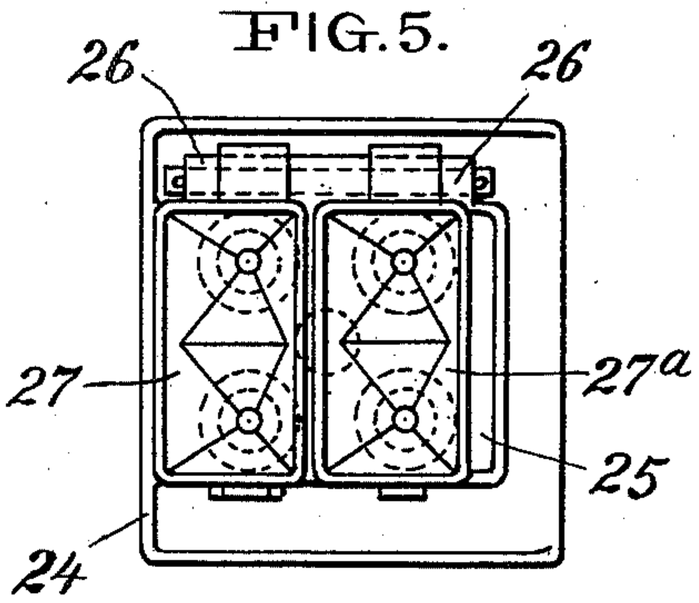


FIG. 6.

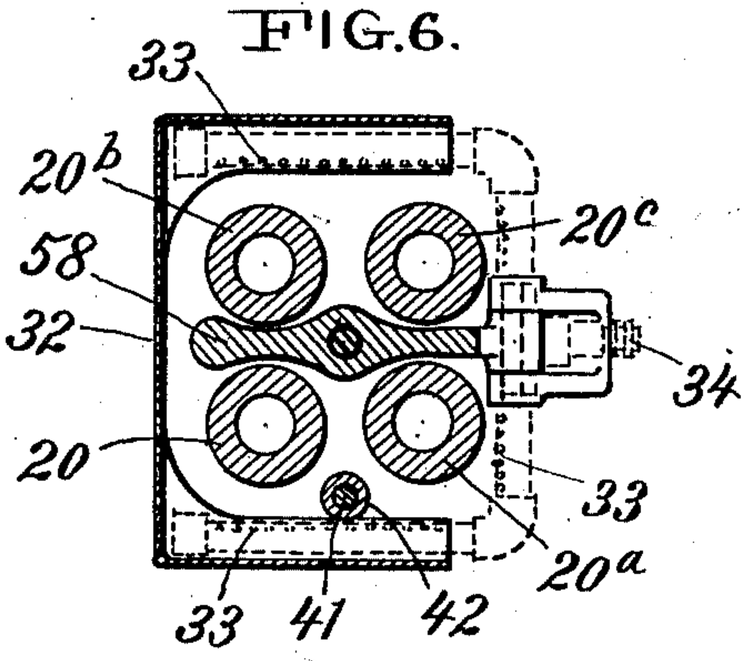


FIG. 7.

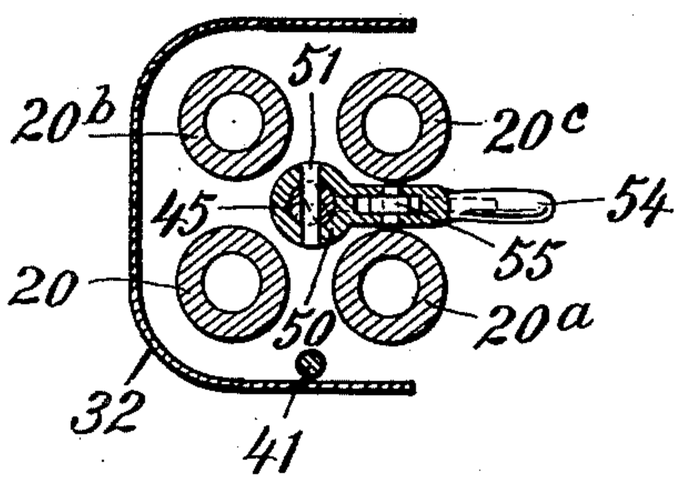


FIG. 8.

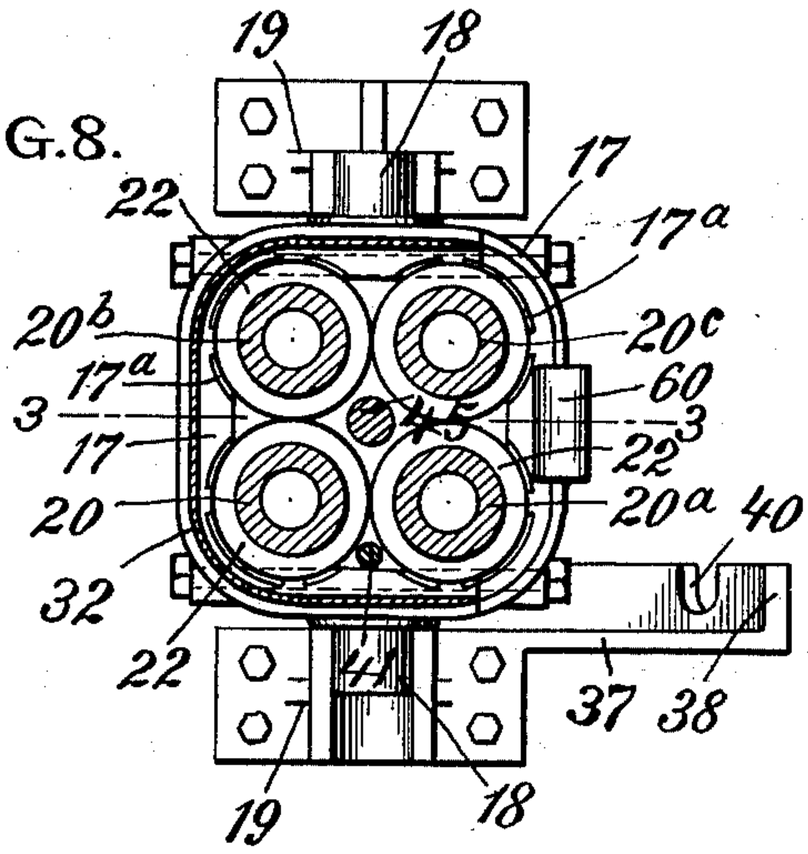


FIG. 9.

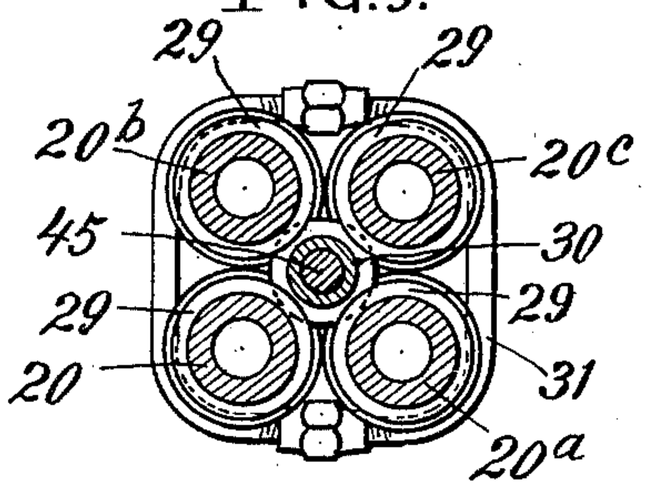
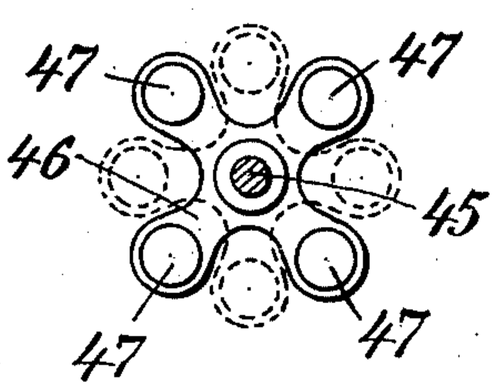


FIG. 10.



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No. 756,325. Patented April 5, 1904.

UNITED STATES PATENT OFFICE.

CHARLES FREDERICK BROOKER, OF ANSONIA, CONNECTICUT, ASSIGNOR TO THE COE BRASS MANUFACTURING COMPANY, OF TORRINGTON, CONNECTICUT, A CORPORATION.

ROD-CASTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 756,325, dated April 5, 1904.

Application filed August 10, 1903. Serial No. 168,885. (No model.)

To all whom it may concern:

Be it known that I, CHARLES FREDERICK BROOKER, a citizen of the United States, residing at Ansonia, county of New Haven, State of Connecticut, have invented certain new and useful Improvements in Rod-Molding Machines, of which the following is a specification.

My invention consists in a machine for casting rods, and is especially adapted for casting rods of copper or brass or copper alloys, although it may be used with other metals or their alloys. Heretofore it has been the practice to form said rods by pouring the molten metal into sectional holes, such molds divided longitudinally and shaped to form two rods. As the rods formed are usually about eight feet in length, such molds are situated so that their lower ends will rest in a pit sunk below the floor of the casting-room with their upper ends projecting above the floor. The sections of the molds are arranged to be held together by straps. The employment of such molds is objectionable for many reasons, among which are that it requires considerable time to place the molds before casting. The workmen are obliged to enter a pit heated to a high temperature by the molds in order to release the molds from the cast rods, and the rods formed in such molds are usually of different section at their ends, which is due to the shape necessarily given to the molds, which ends must be cut off in order to obtain rods of uniform section, thereby entailing considerable waste, and, further, owing to the sectional character of the molds ridges are formed on opposite sides of the rods, which ridges are often granular in character and otherwise objectionable.

The object of my invention is the construction of a machine in which rods of uniform cross-section may be produced and which will not require for its operation the expenditure of the amount of labor required with the old system, and, further, which will materially increase the casting capacity of any given floor-space of a casting-house.

The accompanying drawings will serve to illustrate my invention, in which similar numerals indicate like parts.

Referring to the drawings, Figure 1 is a side elevation of my rod-casting machine. Fig. 2 is a section taken on the line 2 2 of Fig. 1. Figs. 3 and 4 are elevations and partial sections on the line 3 3 of Fig. 8, the dotted lines in these figures indicating different positions which may be given to the molds. Fig. 5 is a plan view of the top of the machine. Fig. 6 is a section on the line 6 6 of Fig. 1. Fig. 7 is a section on the line 7 7 of Fig. 1. Fig. 8 is a section on the line 8 8 of Fig. 1. Fig. 9 is a section on the line 9 9 of Fig. 1. Fig. 10 is a section on the line 10 10 of Fig. 1, also indicating in dotted lines the second position of the spider carrying the stop-rods.

In Figs. 1, 2, 3, and 4 the casting-machine is shown as mounted upon the horizontal floor-beams 15, over which is laid the flooring 16. This flooring is carried up to the front of the casting-machine, but is cut away at the back between two parallel floor-beams 15 15^a, Fig. 2, to permit the machine to be swung upon its trunnions and carried into the positions shown in the dotted lines, Figs. 3 and 4.

The machine as a whole is supported by a ring 17, from which project the trunnions 18, mounted in bearings 19, respectively supported on the parallel floor-beams 15 15^a. Supported by the ring 17 are four tubes 20 20^a 20^b 20^c. These tubes are provided with the external spacing-flanges 21 at the top, 22 at the center, and 23 at the bottom. Situated over the spacing-flanges 21 at the top is a ring 24, provided with a groove 25. Pivoted to standards 26, projecting upward from said ring, are the hoppers or directing-funnels 27 27^a. In Fig. 2 one of the hoppers is shown as down and the other up. Each hopper is formed of two compartments, with an opening in the bottom of each compartment immediately over the casting-tubes. Manifestly a single hopper with four compartments may be used; but I prefer to divide the hopper, as shown. The object of the groove 25 in the ring 24 is to catch any metal which may overflow from the hoppers. Situated in a recess

28, between the spacing-flanges 22, is a supporting-ring 17. Situated between the spacing-flanges 23 and the flanges 29, located above them, is the spacing-flange of a tubular bearing 30, Fig. 9. The rings 24 17 and the strap 31 on the flange 23 serve to tie the tubes 20 20^a 20^b 20^c together.

Arranged externally to the tubes 20 20^a 20^b 20^c is a casing 32. This casing is arranged at the upper part of the machine. It may, however, be arranged to cover both the upper and the lower parts of the machine. Situated within the top of this casing is a perforated water-pipe 33, which is connected to the nozzle 34, Fig. 1, external to the casing. The object of this casing and water-pipe is to permit streams of water to be discharged around the casting-tubes for cooling purposes. Suitable outlets 17^a in the ring 17 for the water are provided in the bottom of the casing.

Depending from the ring 17 at one side is an arm 35, Fig. 2, and mounted in a suitable bearing in this arm is a reciprocating pin 36. Depending from the bearing 19 on the same side of the machine, shaped as the arc of a circle, is a plate 37, on which is a flange 38. In this flange are formed the slots 39 40. Connected to the reciprocating pin 36 is a rod 41, which is carried upward and has a bearing 42 at the top of the machine. Connected to the rod 41 is a lifting-handle 43, which is carried through a slot 44 in the side of the casing 32. The object of this arrangement will be readily understood. When the machine is in the position indicated in Fig. 1 or indicated in the dotted lines, Fig. 3 or Fig. 4, the pin 36 may be made to engage with either the slot 39, slot 40, or the top of the arc-shaped plate 37, and thus serve to hold the machine in either one of the three positions mentioned. I do not in any wise limit myself to the employment of the mechanism shown for defining the position of the machine, as other devices may be used for the same purpose.

Upon reference to the figures it will be observed that the casting-tubes 20 20^a 20^b 20^c are open at the top and bottom. In order to provide means for closing these tubes at the bottom when the molten metal is poured into them and for making pressure upon the cast rods in the tubes to lift them longitudinally in, so that their upper ends will project out of the tubes, and, further, to provide for opening the tubes at the bottom to permit cleaning and swabbing of the tubes and the circulation of air through the tubes, I make use of the device which I will now describe.

Arranged centrally of the tubes 20 20^a 20^b 20^c is a rod 45, which is carried through the tubular bearing 30 at the bottom of the machine. Secured to the bottom of the rod is a spider 46, Fig. 10, and projecting upward from this spider are four stop-rods or pistons 47. These rods at their top are slightly smaller in diameter than the bore of the tubes 20 20^a 20^b 20^c. Secured to the rod 45 near the bottom of the machine is a sleeve 48, Figs. 3 and 4, which is adapted to move over the tubular bearing 30. Located upon the top of the tubular bearing and within the sleeve are the antifriction-balls 49. Surrounding the upper end of the rod 45 is a vertically-movable sleeve 50. Projecting from the interior of this sleeve is a pin 51, which takes in an inclined slot 52, formed through the upper end of the rod. The rod below the slot 52 is cut away, as shown, to form a recess 53. Projecting from the side of the sleeve 50 and through the casing 32 is a handle 54, and pivoted under this handle is a latch 55, the forward end of which engages with the lower shoulder of the recess 53. Projecting from the top of the sleeve 50 is a hook portion 56 and from the lower portion of the sleeve the double hook portion 57.

Depending from the ring 24 is a vertical plate 58, Figs. 3, 4, and 6, and pivoted to one side of this plate is a double hook-latch 59. The three positions of the stop-rod, lifting-rod, sleeve, and hook-latch are shown, respectively, at Figs. 1, 3, and 4. Projecting upward from the ring 17 is a bearing-arm 60.

The operation of my improved device is as follows: When rods are to be cast, the parts are in the position shown in Figs. 1 and 2—that is, with the tubes in a vertical position and their lower ends closed by the stop-rods 47. When the casting has been accomplished and the rods have been sufficiently cooled, the hoppers 27 27^a are raised into the position shown in Fig. 3. A lever of any kind is then carried over the top of the bearing-arm 60 and under one of the hooks of the hook portion 57, as indicated in Fig. 1. Pressure is then made on the outer end of the lever, which lifts the sleeve 50, rod 45, and stop-rods 47 into the position shown in Fig. 3, the hook 56 on the top of the sleeve at such time engaging with the upper hook on the latch 59, the effect of which is to push the cast rods 61, Fig. 3, out of the top of the tubes 20 20^a 20^b 20^c, as shown in Fig. 3. When these acts have been accomplished, the handle 43 is lifted, which disengages the pin 36 from the slot 39, and the machine is tilted into the position indicated in dotted lines, Fig. 3—*i. e.*, with its axis horizontal. The workmen then with proper tongs seize the ends of the cast rods 61 and draw them out of the tubes onto the floor of the casting-room. When the rods have been removed, the machine is then brought back to its vertical position. The latch 59 is disengaged from the hook 56. The workman then depresses the handle 54, thereby carrying the rod 45 downward and the stop-rods 47 out of the casting-tubes and into the position shown in Fig. 4 and when the parts have reached this position lifts the latch 55 to disengage it from the rod 45 and then makes further downward pressure upon the handle 54, which causes the pin 51 to move in the slot

52 in the rod 45, thereby rotating the rod 45 to move the stop-rods 47 out of the axis of the casting-tubes and into the position shown in the dotted lines, Fig. 10. It will be observed that at this time the bottom of the sleeve 48 overlies the balls 49 on the top of the bearing 30. When the parts have reached the position shown in Fig. 4, the machine is again tilted and carried into the position shown in the dotted lines, Fig. 4, and held in this position by the pin 36, engaging with the slot 40. At this time the workmen through the introduction of a proper tool clean out the molds, black-lead them or otherwise treat them, and, if desired, leave them in this position to cool, the cold air passing upward through the tubes. After cooling or immediately, if desired, the machine is again brought to the position shown in Fig. 1.

I have described the machine as consisting of four tubes. Manifestly the machine may consist of one or a plurality of tubes.

Having thus described my invention, I claim—

1. A rod-casting machine, comprising a tube mounted upon a horizontal axis and arranged to be moved in the arc of a circle, a stop-rod located in the lower end of said tube, and means for reciprocating said rod into and out of said tube and for moving it out of the axis of said tube when external to the tube.

2. A rod-casting machine, comprising a series of spaced tubes collectively mounted upon a horizontal axis and arranged to be moved in the arc of a circle, a stop-rod located in the lower end of each tube, means for simultaneously reciprocating said rods into and out of said tubes and for moving said rods out of the axes of said tubes when external to the tubes.

3. A rod-casting machine, comprising a tube mounted upon a horizontal axis, a removable hopper at the upper end of said tube, a stop-rod normally located in the lower end of said tube, means for reciprocating said rod into and out of said tube, and for moving said rod when external to the tube out of the axis of said tube.

4. A rod-casting machine, comprising a tube mounted upon a horizontal axis, a casing surrounding said tube, means for cooling said tube, a stop-rod movable within and out of the lower end of said tube, means for effecting reciprocation of said rod, and means for rotating said rod around the axis of the moving means to move said rod out of the axis of said tube.

5. A rod-casting machine comprising a tube normally open at both ends mounted upon a horizontal axis and arranged to be moved in the arc of a circle, means for fixing said tube in certain defined positions relative to the vertical, means for closing the lower end of the tube, means for locking said closing means, and means for creating bodily movement of the closing means within the tube along the tube.

6. A rod-casting machine, comprising a tube mounted upon a horizontal axis, means for closing the lower end of the tube, means for locking said closing means, means for moving the molded rods formed in the tube partly out of the tube, and means for depressing and rotating said closing means to open the bottom of the tube.

7. A rod-casting machine, comprising a tube mounted upon a horizontal axis, means for closing the bottom of the tube, means for locking said closing means, means for elevating said closing means within the tube, means for locking said parts in said second position, and means for depressing and rotating said closing means to open the bottom of the tube.

8. A rod-casting machine, comprising a tube, a stop-rod in the bottom of the tube, a vertical rod for reciprocating said stop-rod, a sleeve on the upper end of said vertical rod, a latch between said sleeve and said vertical rod, means for moving said sleeve, and a locking device for holding said sleeve and vertical rod in two defined positions.

9. A rod-casting machine, comprising a tube, a stop-rod in the bottom of the tube, a vertical rod for reciprocating said stop-rod, a sleeve on the upper end of said vertical rod, a latch between said sleeve and said vertical rod, means for moving said sleeve, a locking device for holding said sleeve and vertical rod in two defined positions, and means for releasing and rotating said vertical rod.

10. In a rod-casting machine, the combination of a plurality of spaced tubes, means for securing said tubes together, trunnions projecting horizontally from the central securing means, bearings for said trunnions, a slotted arc-shaped plate depending from one of said bearings, a reciprocating pin adapted to coact with said slots in said plate, and means for reciprocating said pin.

11. In a rod-casting machine, the combination of a plurality of spaced tubes, a tubular bearing situated between the tubes and at the bottom thereof, a vertical rod extending through said bearing, a sleeve connected to said rod and situated over said tubular bearing, antifriction-balls situated between the top of said bearing and the interior of said sleeve, a spider on the end of said rod, stop-rods projecting upward from said spider and adapted to enter the bottom of said tubes, and means for reciprocating and rotating said rod.

12. In a rod-casting machine, the combination of a tube open at both ends, a stop-rod adapted to enter and close the bottom of the tube, means for locking said stop-rod in such closed position, means for reciprocating said stop-rod into and out of said tube, and means for collectively mounting said parts upon a horizontal axis and for moving them in an arc of a circle.

13. In a rod-casting machine, the combination of a tube open at both ends, a stop-rod adapted to enter the bottom of the tube, means for reciprocating said stop-rod into and out of said tube, and for rotating and moving it out of the axis of the tube.

14. In a rod-casting machine, the combination of a plurality of tubes provided with spacing-flanges, a grooved ring at the top of the tubes, a ring provided with trunnions situated at approximately the center of said tubes and a binding-ring at the bottom of the tubes, a casing surrounding said tubes, together with means for discharging a cooling spray around said tubes within said casing.

15. A rod-casting machine embodying in its construction, one or more tubes normally open at both ends, together with means for closing the end of said tube or tubes and for pushing the cast rods from within outward.

16. A rod-casting machine embodying in its construction, one or more tubes normally open at both ends, and mounted upon a horizontal axis, together with means for closing the end of said tube or tubes and pushing the cast rods within the tube or tubes from within outward.

17. In a rod-casting machine, the combination of a tube normally open at both ends, a reciprocating stop-rod having approximately the diameter of said tube and located in the lower end of said tube, means for reciprocating said stop-rod, and means for defining the position of said stop-rod in said tube.

18. In a rod-casting machine, the combination of a tube, a ring surrounding the top of the tube, a pivoted hook depending from said ring, a reciprocating stop-rod, a rod for reciprocating said stop-rod, a reciprocating sleeve on the top of said reciprocating rod, said rod having a slot adapted to engage a pin projecting from the interior of said sleeve, a hook on said sleeve adapted to engage with the pivoted hook, and means for reciprocating said rod and sleeve and for rotating said rod and sleeve.

19. In a rod-casting machine, the combination of a tube of uniform interior diameter throughout its length and open at both ends, a reciprocating stop-rod corresponding in diameter with the tube and located in the lower end of the tube, means for reciprocating such stop-rod into and out of said tube, and means for defining the position of said stop-rod in the tube.

20. In a rod-casting machine, the combination of a tube open at both ends, a hopper through which the material to be cast is fed into the tube located at the top of the tube, a stop-rod situated at the lower end of the tube and normally out of the tube, together with means for bringing such stop-rod into the bottom of the tube and for reciprocating it within the tube.

In testimony whereof I affix my signature in the presence of two witnesses.

CHARLES FREDERICK BROOKER.

Witnesses:
W. A. WOOD,
DWIGHT A. BURNHAM.