

July 30, 1929.

F. L. FELTES

1,722,371

PISTON CASTING MACHINE

Filed Feb. 12, 1926

3 Sheets-Sheet 1

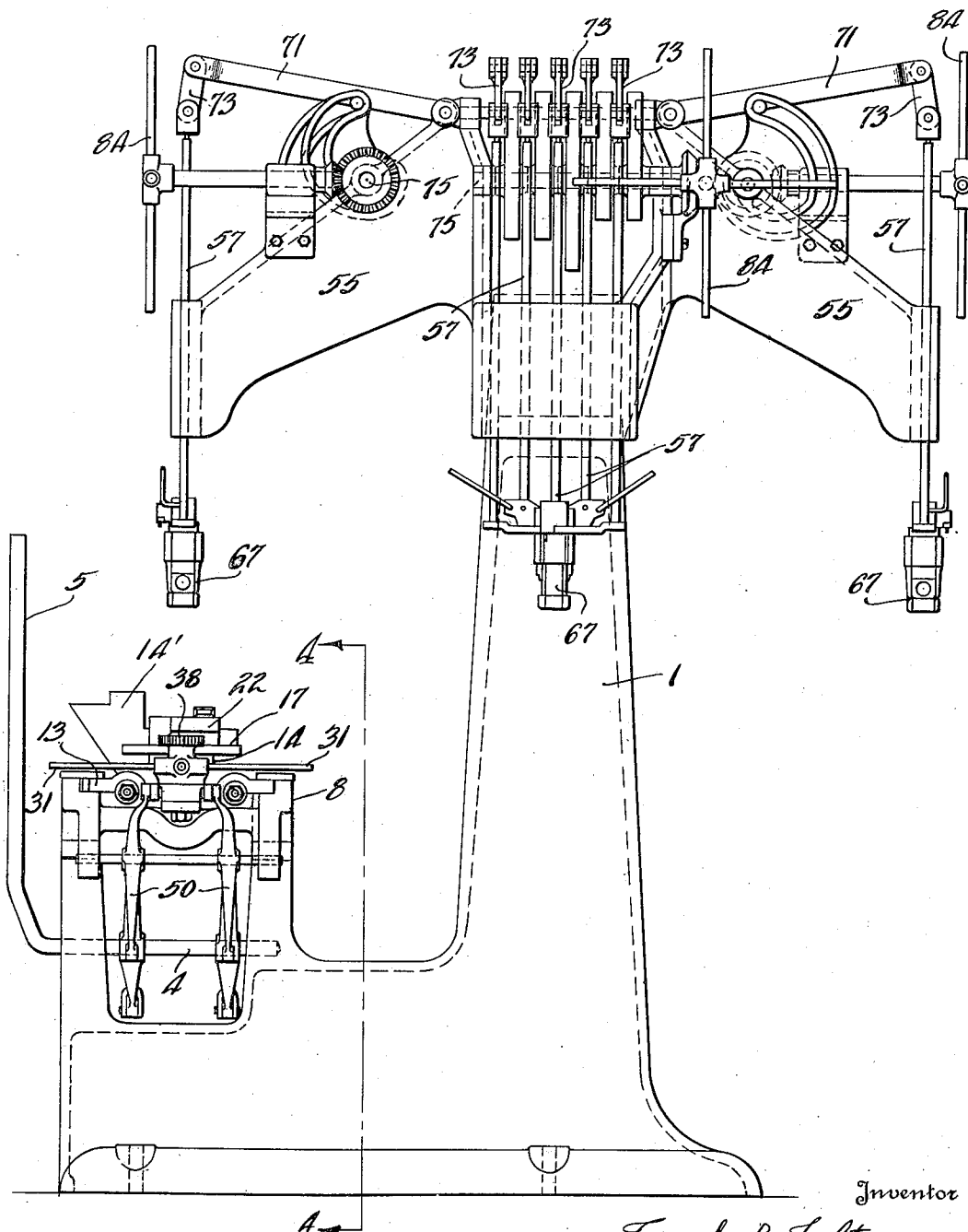


FIG. 1

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3 Sheets-Sheet 2

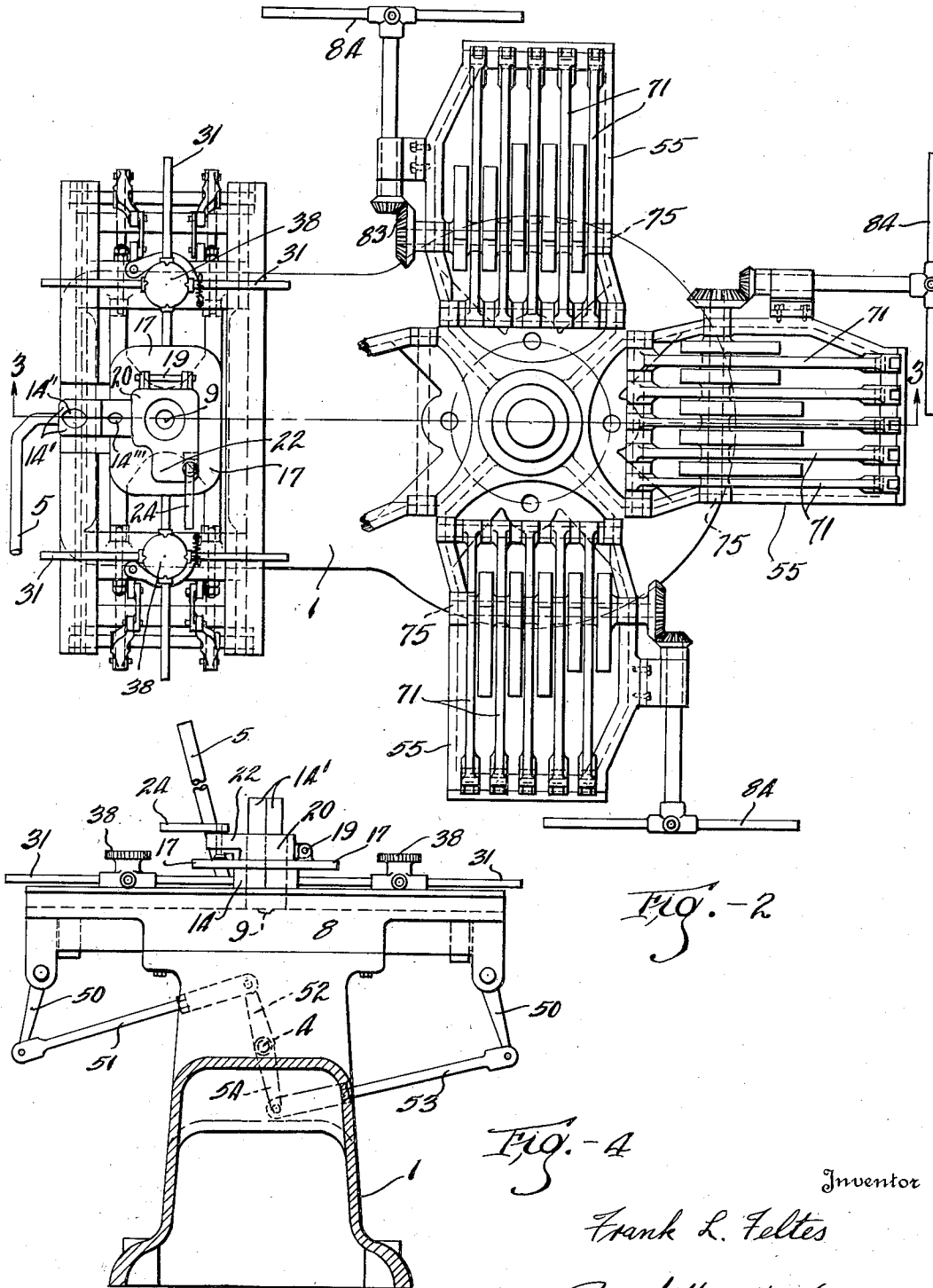


FIG. - 2

FIG. - 4

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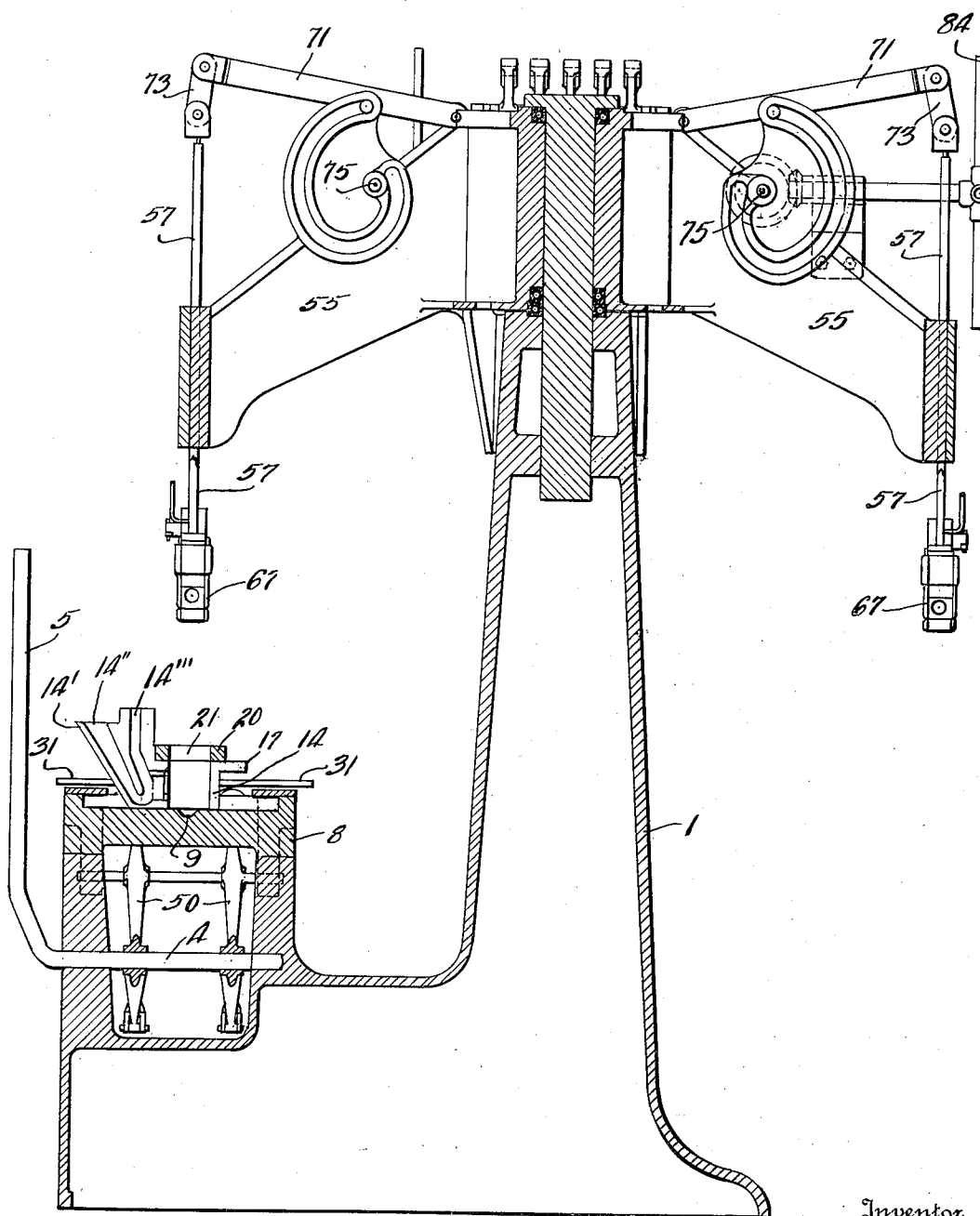


Fig. - 3

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UNITED STATES PATENT OFFICE.

FRANK L. FELTES, OF CLEVELAND, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO ALUMINUM COMPANY OF AMERICA, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

PISTON-CASTING MACHINE.

Application filed February 12, 1926. Serial No. 87,827.

This invention relates to casting machines for making so-called die castings, particularly of pistons, and generally is an improvement over the piston casting machine set forth in my co-pending application Serial No. 72,276 filed Nov. 30, 1925.

The object of this invention is to simplify the mold portion of the casting machine and make possible more rapid operation of the machine by making better provision for heat transfer and dissipation.

These objects will be apparent from the following description taken in connection with the accompanying drawings in which similar or corresponding parts bear reference numerals in so far as possible common with those in my co-pending application above referred to, Fig. 1 being a side elevation of the machine; Fig. 2, a plan view, one of the core forming heads being broken away to uncover the mold forming table; Fig. 3 is a section along the line 3—3, Fig. 2; and Fig. 4 is a section along the line 4—4, Fig. 1.

The principal parts of the machine are a base or frame 1 raised at its front portion to support a mold-forming unit, and at its rear portion to a head upon which are mounted a number of core-forming units, adapted for rotation to successively register with the mold-forming unit to effect operation of the mold and core to form a piston.

Across the forward raised portion of the frame is a heavy member 8 forming a table, and provided with a finished upper surface containing at its center a small depression 9 for the purpose of forming a centering lug upon the piston. Slidably mounted upon the surface of the table and suitably guided thereon are a pair of half round mold sections 14 adapted for co-operation to form a cylindrical mold, the plane of parting between them being in the diameter of the cylinder; the forward portions of these parts are extended at 14' to form, when in contact, a sprue 14'' and a riser 14''' leading to the cylinder cavity. Beneath the table is a rock shaft 4 movable by the lever 5 and connected by suitable linkage members 50, 51, 52, 53, as shown with the mold members 14 in such a manner that movement of the lever 5 in one direction (to the right, Fig. 4) will slide the members apart on the table to open the mold, and in the other direction will bring them together in the position shown.

The members 14 are flanged at 17; upon the flange of one of the members is pivotally mounted at 19 a top plate 20 securable upon the corresponding flange of the opposite member 14 by a latch lever. The top plate is provided with a bore in prolongation of that of the members 14 in closed position, and serves to lock the members in such position.

At each side of the table is a turret 38 provided with outstanding core pins 31 adapted for insertion into corresponding holes in the member 14 by sliding the members 38 inwardly upon suitable ways provided for the purpose.

The core pins 31 are provided in multiple as shown, so that they may be used in succession by rotation of the turrets to thus allow for cooling. Cooling of the remaining portion of the mold is effected largely by conduction through the relatively large masses of metal, especially in the table 8, which it will be noted forms the bottom closure of the mold as well as supporting means for the members 14 in all positions.

The core adapted to correspond with the mold is necessarily built up of a number of separate members requiring insertion and withdrawal in proper sequence. In my co-pending application referred to I have minutely described this sectional core 67, as well as the means for its operative assembly and disassembly, consisting of a series of rods 57, operated through links 73 and levers 71 by suitably shaped cams fixed upon a common shaft 75 which in turn is operable through miter gears by a hand means 84; the whole being supported by a frame member 55 extending out sufficiently to properly position the core in registry for insertion into the mold.

In my invention I employ a plurality of heads each complete in itself as described, and mounted as shown for rotation about the head of the frame, the dimensions being such that the several cores may be successively brought into registry with the mold for insertion therein as in the case of the single core machine described.

In the core member which in service is almost completely surrounded by the casting metal there is relatively small possibility of heat dissipation; radiation while in the mold being impossible and, owing to the low ratio of surface area to volume, radiation

while out of the mold being slight, and dissipation by conduction along the rods 57 being almost negligible. It is for this reason, and especially owing to the improvements in my mold assembly set forth herein that I have employed a multiple head arrangement, the relative time of exposure of the core to the casting metal being obviously decreased accordingly as the number of heads employed is increased, and the capacity of my improved mold being approximately equal to that of the four cores shown, although any other number could be used as well under changed conditions.

The result is in effect a single unit of greatly increased capacity over machines of similar purpose heretofore employed in the art.

What I claim is:

1. In a piston casting machine, a base including a table provided with members slidable thereon into and out of mold forming relation therewith, a head on said base, a plurality of sets of core forming members movably mounted on said head for successive registry with said mold, and means for actuating each set of core forming members to effect the assembly of each core forming unit in co-operating relation with the mold to bound a piston forming cavity.

2. In a piston casting machine, a base including a table provided with members slidable thereon into and out of mold forming relation therewith, a head on said base, a plurality of sets of core forming members movably mounted on said head for successive registry with the mold, and means for

actuating in predetermined sequence the members of each set for cooperation with the mold to complete a piston forming cavity and release a piston cast therein.

3. In a piston casting machine a base comprising a mould-forming unit supporting member and a supporting head member adapted to carry a plurality of core forming units, means associated with said supporting head member to effect the successive alignment of each core-forming unit with the said mould forming unit and means for effecting the assembly of each core forming unit with the said mould-forming unit.

4. In a piston casting machine a base comprising a mold-forming unit supporting member and a supporting head member adapted to carry a plurality of core forming units, rotative means associated with said supporting head member to effect the successive alignment of each core-forming unit with the said mould forming unit and movable core-forming unit supporting means for effecting the cooperative engagement of a core-forming unit with the mould forming unit.

5. In a piston casting machine a base comprising a mould forming unit supporting member, a core-forming unit and a supporting member for said unit, said supporting member having adjustable means for effecting the registry and insertion of the core-forming unit with the mould forming unit.

In testimony whereof I hereby affix my signature.

FRANK L. FELTES.