Oct. 24, 1950 C. F. WILBERSCHIED 2,526,918

MOLD OPERATING DEVICE

Filed Oct. 7, 1948 3 Sheets-Sheet 1

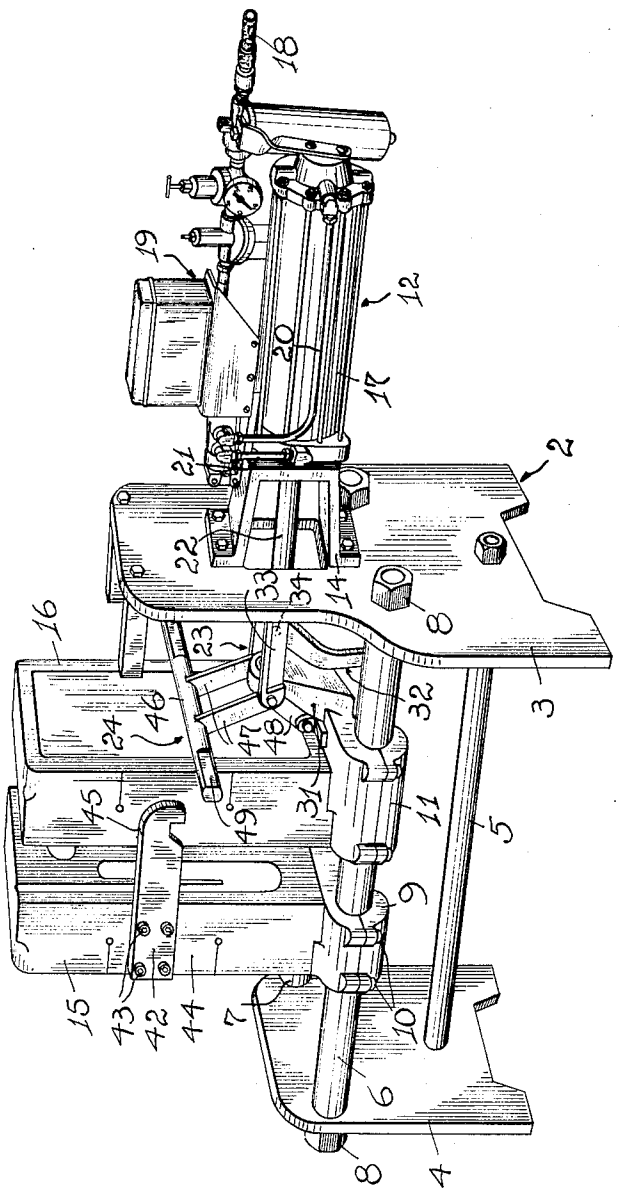


FIG. 1

INVENTOR.
CHARLES F. WILBERSCHIED
BY
Gustav A. Wolff.
ATT.

Oct. 24, 1950 C. F. WILBERSCHIED 2,526,918

MOLD OPERATING DEVICE

Filed Oct. 7, 1948 3 Sheets-Sheet 2

FIG. 2

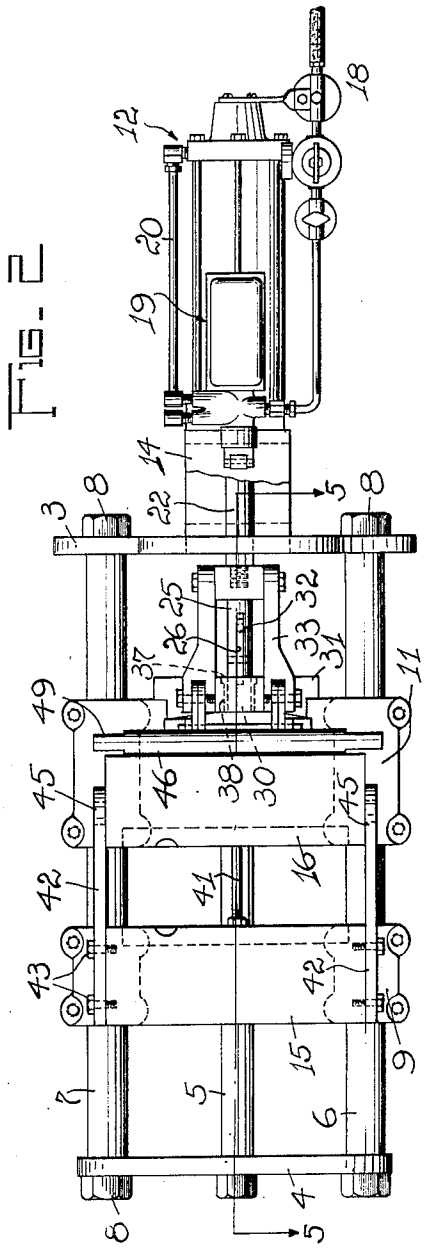


FIG. 3

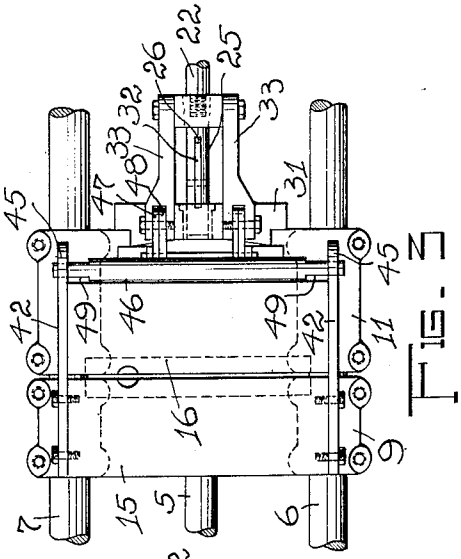
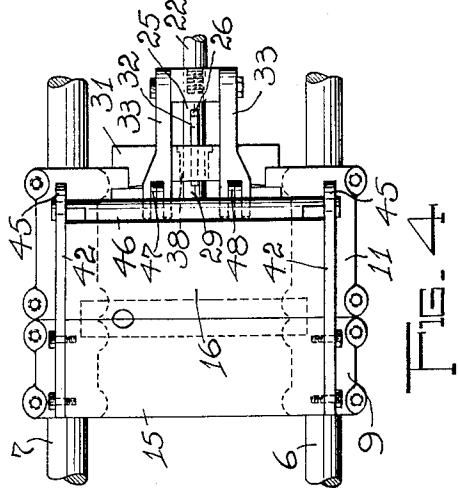


FIG. 4



INVENTOR.
CHARLES F. WILBERSCHIED
BY
Gustav A. Wolff.
ATT.

Oct. 24, 1950 C. F. WILBERSCHIED 2,526,918

MOLD OPERATING DEVICE

Filed Oct. 7, 1948 3 Sheets-Sheet 3

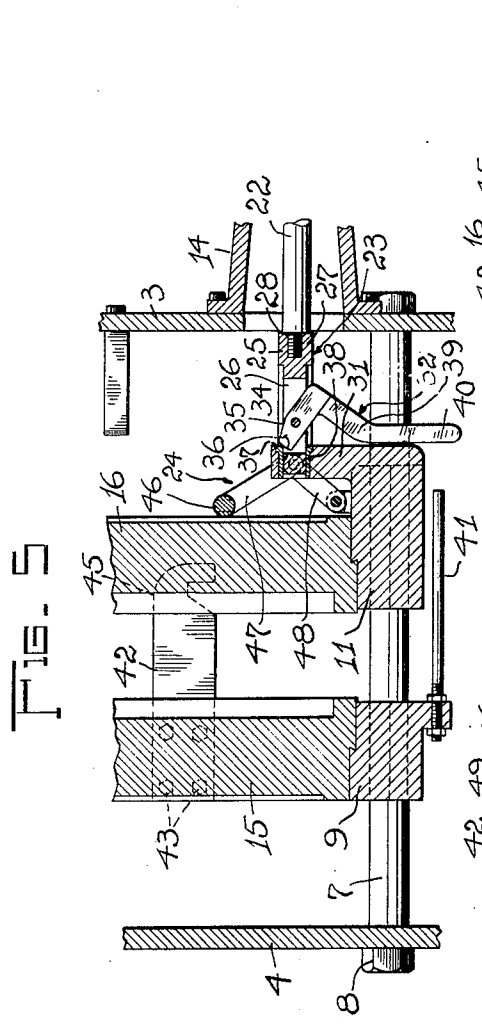


FIG. 5

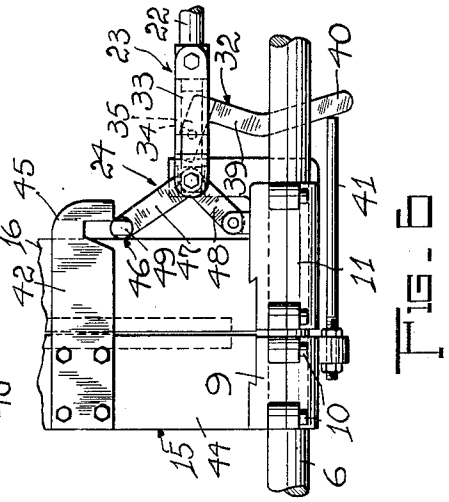


FIG. 6

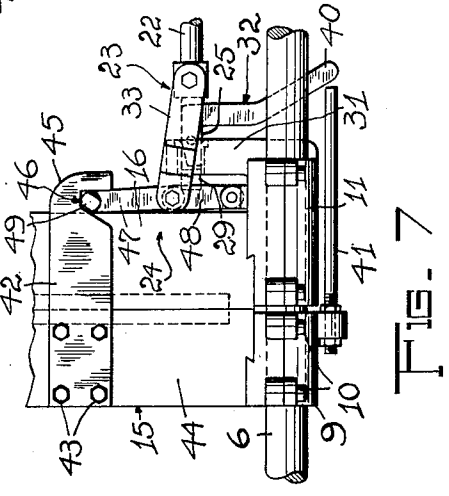


FIG. 7

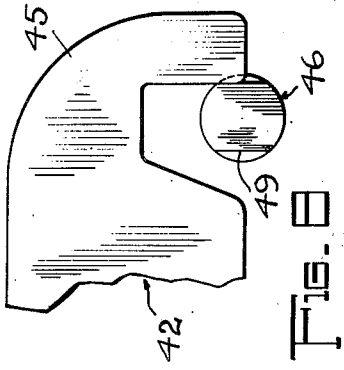


FIG. 8

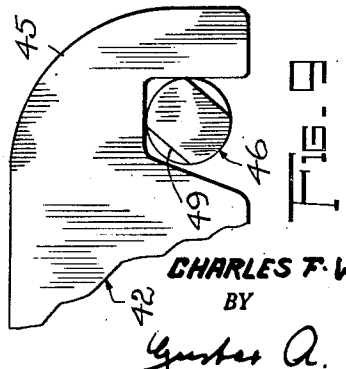


FIG. 9

INVENTOR.
CHARLES F. WILBERSCHIED
BY
Gustav A. Wolff.
ATT.

Patented Oct. 24, 1950 2,526,918

UNITED STATES PATENT OFFICE

2,526,918

MOLD OPERATING DEVICE

Charles F. Wilberschied, Cleveland, Ohio, assignor to Vincent J. Sedlon, Bay Village, Ohio

Application October 7, 1948, Serial No. 53,267

6 Claims. (Cl. 22—92)

1

This invention relates to machines for making castings in metallic molds, particularly that type of machines which are made in two or more mold sections movable toward and from each other by power mechanism acting in a plane perpendicular to the parting plane between the proximate faces of the mold members; and is an improvement of the structure disclosed in my pending application Serial No. 791,569, filed December 13, 1947, which shows a casting machine of the type referred to above in which the mold sections are shifted toward each other by mechanism constructed to successively effect pushing of the mold sections to closed position and thereafter drawing of the mold sections tightly toward each other to prevent, in casting operations, deforming and warping of the molds or dies by substantial temperature changes present in casting operations.

The primary object of the present invention is the provision of a casting machine of the type referred to above with a mechanism arranged to directly push one of the mold sections toward the other one and at predetermined position of said one mold section effect drawing of said one mold section toward the other mold section, the mechanism including a coupling member provided with shiftable lever means to permit direct pushing of said one mold section toward the other one and direct actuation of clamping mechanism supported by said mold sections and adapted to draw said sections toward each other.

With the above and other incidental objects in view which will appear hereinafter, the invention consists in certain other novel features of construction and combination of parts, the essential elements of which are set forth in the appended claims and a preferred form of embodiment of the invention is hereinafter shown with reference to the drawings accompanying and forming part of the specification.

In the drawings:

Fig. 1 is a perspective view of a machine for making castings constructed in accordance with the invention, the mold sections being shown in axially spaced relation with respect to each other.

Fig. 2 is a plan view of the machine shown in Fig. 1.

Fig. 3 is a fragmentary plan view similar to Fig. 2 showing the mold sections in almost closed position prior to their being drawn toward each other.

Fig. 4 is a fragmentary plan view similar to Fig. 3 showing the mold sections tightly drawn together.

2

Fig. 5 is a fragmentary longitudinal, sectional view on line 5—5 of Fig. 2.

Fig. 6 is a fragmentary side view showing the mold sections in almost closed position prior to their being drawn toward each other.

Fig. 7 is a fragmentary side view similar to Fig. 6 showing the mold sections tightly drawn together.

Fig. 8 is a fragmentary view showing the locking elements partly engaged prior to their action of drawing the mold sections toward each other.

Fig. 9 is a fragmentary view similar to Fig. 8 showing the locking elements in tightly engaged clamping action when tightly drawing the mold sections toward each other.

Referring now more in detail to the exemplified form of the invention shown in the drawings, reference numeral 2 denotes the frame of a machine for making castings, which frame embodies two upright end plates 3 and 4 secured in spaced relation to each other by a tie rod 5 and a pair of parallel, spaced guide rods or ways 6 and 7. The guide rods which are secured to the end plates by nut members 8, adjustably support a stationary mold supporting member 9 fixedly secured to said guide rods by set screws 10, and freely shiftably mount a shiftable mold supporting member 11 coupled with an actuating device 12 secured to a bracket 14 on end plate 3. Mold supporting members 9 and 11 mount rigidly secured thereto complementary mold sections 15 and 16, of which mold section 15 is mounted on the stationary mold supporting member 9 and mold section 16 is mounted on the shiftable mold supporting member 11, so as to guide shiftable mold section 16 in parallel relation with respect to stationary mold section 15.

Actuating device 12 for shifting mold section 16 on ways 6 and 7 embodies a fluid-actuated cylinder piston member 17 connected by a hose 18 with a source of fluid pressure (not shown). Member 17, as customary and not shown in detail, is actuated by an automatically actuated valve arrangement 19 feeding successively through pipes 20 and 21 fluid under pressure into the opposite ends of the cylinder piston member 17 to effect automatic shifting of its piston and piston member 17 in opposite directions. Each operating cycle of the machine effects closing of the mold by shifting mold section 16 toward stationary mold section 15, drawing of the mold section 16 toward mold section 15 and, after casting operations, returning mold section 16 to its original position. Closing of the mold is thus effected in two steps, shifting of mold section 16 toward mold

section 15 and forcible drawing of the mold sections toward each other. For such purpose the piston of cylinder piston member 17 has its piston rod 22 coupled with mold supporting member 11 by means of a coupling mechanism 23 constructed to directly couple mold supporting member 11 with piston rod 22 and, in a predetermined position of mold supporting member 11, effect a lost motion between piston rod 22 and member 11 to permit independent actuation of a lever mechanism 24 adapted to forcibly draw shiftable mold section 16 toward stationary mold section 15, as will be later described.

The coupling mechanism 23 embodies an elongated base member 25 which is axially slotted at 26 and near its end portion 27 threadedly engaged with piston rod 22 at 28. Base member 25 has its free end 29 freely shiftably extended through a bushed hole 30 in an upwardly extended, bracket-like portion 31 of shiftable mold supporting member 11 and pivotally supports in slot 26 an L-shaped lever 32. Furthermore, base member 25 has pivoted to its end 27 link members 33 which connect the base member with the lever mechanism 24. The L-shaped lever 32 is pivoted to base member 25 by a pin 34 extended through the short arm 35 of said lever about midway thereof to automatically and by gravity position the lever 32 as indicated in Fig. 5, so as to engage with its curved front face 36, the outer edge 37 of a bushing 38 in hole 30 of bracket-like portion 31 and prevent relative movement between the mold supporting member 11 and the coupling mechanism 23 when such mechanism is shifted in a direction toward the stationary mold supporting member 9. The longer arm 39 of L-shaped lever 32 is bent to extend its end portion 40 downwardly in substantially vertical direction adjacent to the end wall of shiftable mold supporting member 11 when such lever is gravity controlled and facilitate tilting of such lever by an actuating rod member 41 axially adjustably mounted on stationary mold supporting member 9.

Rod member 41 is dimensioned to contact and tilt lever 32 to disengage its curved front face 36 from the outer edge 37 of bushing 38 and thereby permit lost motion between coupling mechanism 23 and shiftable mold supporting member 11 when the latter is shifted to a position adjacent to stationary mold supporting member 9. This disengagement of lever 32 permits further shifting of the coupling mechanism 23 as short arm 35 of lever 32 can freely pass through bushing 38 and this shifting is utilized for actuation of lever mechanism 24 coupled with mechanism 23 by link members 33.

Lever mechanism 24 embodies bracket members 42 attached by set screws 43 to the outside of the side members 44 of stationary mold section 15 in such a fashion that the hook-shaped ends 45 of bracket members 42 extend forwardly of mold section 15, and furthermore embodies a shiftable, elongated locking member 46 which slidably contacts the rear wall of shiftable mold section 16 and is coupled therewith in a manner hereinafter to be described. The locking member 46 has extended from its central portion two parallel arms 47 having their end portions linked by link members 48 to the shiftable mold supporting member 11. This arrangement permits vertical shifting and axial rotation of the locking member 46 when coupling mechanism 23, linked to lever mechanism 24, is shifted with respect to the shiftable mold supporting member 16, at the time the latter member, as previously stated, is positioned adjacent to the stationary mold supporting member 9 and lever 32 is disengaged from its contact with the outer edge of bushing 38 in bracket-like portion 31.

Locking member 46 has squared end portions 49 which are aligned with the hook-shaped ends 45 of bracket members 42 to permit their interengagement when locking member 46 is shifted vertically and rotated axially. Rotation of the locking member effects forcible drawing of shiftable mold section 16 toward stationary mold section 15 due to the lever and crossbar-like action of the squared end portions 49 of locking member 46, which action is similar to the action of eccentric members when arranged in place of the squared end portions.

The ratio of leverage used in the drawing together of mold sections 15 and 16 effects forceful drawing together of these sections and thus eliminates in casting operations deforming and warping of these sections.

In describing the operation of the machine it will be assumed that, as shown in Fig. 2, the machine is in opened-up position ready to be started on a casting cycle. Starting of the machine is effected by the operation of the automatically actuated valve arrangement 19 effecting feeding of fluid under pressure through pipe 20 into the outer end portion of cylinder-piston member 17 and therewith shifting of piston and piston rod 22 and shiftable mold supporting member 11 toward the stationary mold supporting member 9 until mold section 16 supported by member 11 closely approaches mold section 15 supported by member 9. At this time actuating rod member 41 contacts the longer arm 39 of L-shaped lever 32 and tilts this lever so that its short lever arm 35 is shifted out of engagement with outer edge 37 of bushing 38 and free to be shifted through said bushing, thus permitting lost motion between piston rod 22 and shiftable mold supporting member 11, which at this time has advanced to bring shiftable mold section 16 into or nearly into contact with the stationary mold section 15. A continued advance of piston rod 22 effects actuation of lever mechanism 24 coupled with piston rod 22 by the link members 33 of the coupling mechanism 23. This actuation effects shifting of locking member 46 vertically upwardly into engagement with the hook-shaped ends 45 of bracket members 42 and also rotating of locking member 46 so that a cam-like and crowbar-like action of the squared end portions 49 tightly and forcibly draws shiftable mold section 16 toward stationary mold section 15, thus preventing deforming and warping of these sections by excessive temperature variations during casting operations. After a predetermined time interval for casting operations, which interval is controlled by the setting of the automatically actuated valve arrangement 19, fluid under pressure is fed through pipe 21 into the inner end portion of cylinder-piston member 17 and effects withdrawing of the locking member 46 from engagement with the hook-shaped ends 45 of bracket members 42 and thereafter pulling of the shiftable mold supporting section 11 back to starting position on ways 6 and 7 ready for another cycle of operation.

Having thus described my invention, what I claim is:

1. In a machine for making castings a pair of mold sections, a frame rigidly supporting one of said mold sections and shiftably supporting the other one of said mold sections, mechanism in-

cluding stationary means on said rigidly supported mold section and toggle lever means pivoted to said shiftable mold section for forcibly drawing the mold sections together, a shifting device for the shiftable mold section, a coupling linking said toggle lever means to said shifting device including a coupling member releasably coupling said shifting device to said shiftable mold section, and stationary means attached to said rigidly supported mold section arranged to engage said coupling member and shift same to release the coupling connection between said shiftable mold section and said shifting device when said mold sections closely approach each other.

2. In a machine for making castings a rigidly supported mold section, a shiftably supported mold section movable toward and away from said first mold section, mechanism on said mold sections for forcibly drawing same together, said mechanism including stationary means on the rigidly supported mold section and toggle lever means pivoted to said shiftable mold section, a shifting device for shifting said shiftable mold section, a coupling secured to said shifting device and linked to said toggle lever means including a shiftable coupling member releasably coupling said shifting device to said shiftable mold section, and a stationary actuating member for said shiftable coupling member attached to said stationary mold section for releasing the coupling connection between said shiftable mold section and said shifting device when said mold sections closely approach each other.

3. A machine for making castings as described in claim 2, wherein said shiftable coupling member consists of an L-shaped lever pivotally supported in a slot of the coupling linked to said toggle lever means, wherein said L-shaped lever by gravity action is automatically positioned to engage the shiftably supported mold section and wherein said stationary actuating member effects tilting of said L-shaped lever for its disengagement from the shiftably supported mold section when the mold sections closely approach each other.

4. In a machine for making castings, a pair of mold sections, a frame rigidly supporting one of said mold sections and shiftably supporting the other one of said mold sections, mechanism on said mold sections for forcibly drawing same together, said mechanism including stationary means attached to the rigidly supported mold section and vertically shiftable and axially rotatable lever means pivoted with one end to said shiftably supported mold section, a shifting device for the shiftable mold section, a coupling linking said lever means to said shifting device including a shiftable coupling member releasably coupling said shifting device to said shiftable mold section, and a stationary actuating member for said shiftable coupling member attached to said stationary mold section for releasing the coupling connection between said shiftable mold section and said shifting device when said mold sections closely approach each other.

5. A machine for making castings as described in claim 4, wherein said stationary means on said rigidly supported mold section embodies a hook-shaped member having its hook-shaped end portion arranged to extend beyond the rear face of the shiftable mold section when said mold sections are positioned adjacent to each other, wherein said toggle lever means linked to said shiftable mold section embodies an elongated member having its longitudinal axis arranged at a right angle to the longitudinal axis of the said stationary means, said elongated member including a cam-like portion arranged to cooperate with the hook-shaped end portion of said stationary means when the mold sections are positioned adjacent to each other to tightly draw the sections toward each other when the elongated member engages the hook-shaped member and is axially rotated with respect thereto.

6. A machine for making castings as described in claim 4, wherein said stationary means on said rigidly supported mold section embodies a pair of hook-shaped members secured to the side walls of said stationary mold section so as to extend with their hook-shaped portions beyond the rear face of the shiftable mold section when said mold sections are positioned adjacent to each other, wherein said toggle lever means linked to said shiftable mold section embodies an elongated rod arranged at a right angle to said pair of hook-shaped members, and wherein said elongated member extends opposite to the said hook-shaped members and includes cam-like portions cooperating with said hook-shaped ends in forcibly drawing the mold sections toward each other and holding same tightly against each other when such elongated rod is axially rotated with respect to said hook-shaped members.

CHARLES F. WILBERSCHIED.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,841,490	Maynard	Jan. 19, 1932
2,298,043	Dinzl	Oct. 6, 1942
2,319,479	Ryder	May 18, 1943
2,335,807	Smith	Nov. 30, 1943
2,371,547	Rosenlund	Mar. 13, 1945