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DIE-CASTING MACHINE

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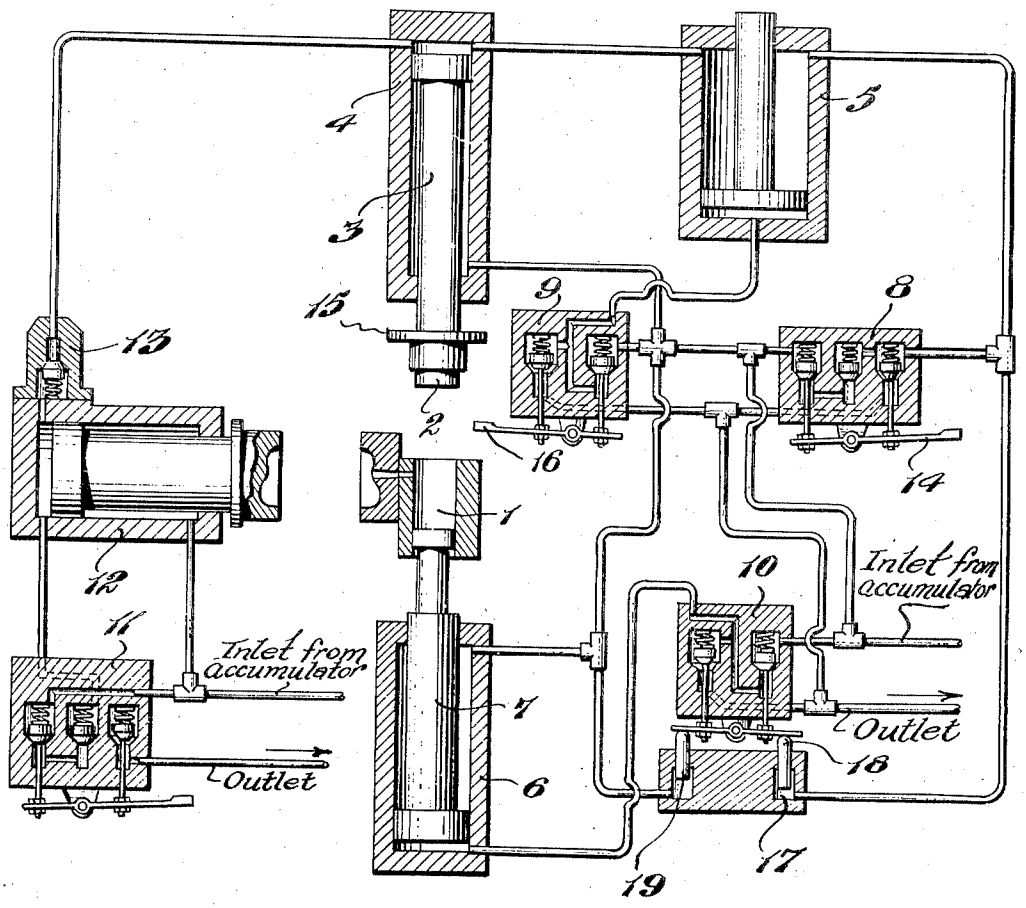

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DIE-CASTING MACHINE

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1 Claim. (Cl. 22—68)

For shutting off the pressure space of hydraulically operated die-casting and like machines an element is provided, which is moved either transversely or perpendicularly with respect to the direction of motion of the press piston. The invention relates to a mode of operation for such die-casting machines with a hydraulically operated closing element of the pressure space and has for its object firmly to secure this closing element in its closed position during the casting operation and thus to prevent the press piston lifting the closing element through the intermediary of the metal present in the pressure space and the metal escaping not oily into the mould, but also into the atmosphere.

The invention consists in this, that the pressure prevailing in the cylinder of the closing element, after reaching a predetermined height, initiates the motion of the press piston. This motion can thus only occur, until the pressure in the cylinder of the closing element absolutely prevents a yielding or lifting of the latter out of its closed position, owing to the effect of the pressing pressure. With advantage the motion of the closing piston up to the moment of closing of the pressure space is effected by the accumulator pressure used for operating the machine, whilst the greater power required for keeping the closing element in its closed position during the casting operation is obtained through the interposition of a hydraulic pressure intensifier which also releases the motion of the press piston.

In the accompanying drawing a constructional example of an installation of a die-casting machine according to the invention is shown diagrammatically.

In this drawing 1 is the pressure space which is to be filled with the casting material, 2 the closing element with the piston 3, 4 the hydraulic cylinder for the latter, 5 the pressure intensifier, 6 the hydraulic cylinder with the press piston 7, 8 a normal two-valve control apparatus with a non-return valve, 9 a normal two-valve control apparatus, 10 a normal two-valve control apparatus which is influenced by the higher pressure in the cylinder 4, 11 a normal two-valve control apparatus containing a non-return valve, 12 the hydraulic cylinder for displacing the movable half of the mould and 13 a non-return valve.

The mode of operation is as follows: By actuating the foot lever 14 at the control apparatus 8 the driving medium passes with accumulator pressure by way of the space above the piston in the pressure intensifier to the cylinder 4, the piston 3 of which moves downwards until it bears against the edge of the pressure space 1. Shortly before this the piston collar 15 has actuated the adjusting lever 16 of the control apparatus 9 and has thereby conveyed water under pressure to the under side of the piston in the pressure intensifier 5. This causes an increased pressure in the annular space of the pressure intensifier, which, owing to the provision of the non-return valve in the control apparatus 8, cannot be propagated to the accumulator. This pressure, however, becomes operative in the cylinder 4, its predetermined maximum value acting on the piston 3 for securely keeping the closing element 2 in the closed position. This increased liquid pressure however also occurs in the cylinder 17 of the control apparatus 10 and acts on the piston 18. Since the piston 19 is only exposed to the accumulator pressure, the piston 18 causes the rocking member of the control apparatus 10 to tilt, so that water under pressure enters the cylinder 6 and the press piston 7 is moved so as to perform the casting operation.

On the foot lever 14 of the control apparatus 8 being released and a reversal of its valves thus taking place, the piston 3 will move upwards under the action of the constant accumulator pressure, thereby releasing the adjusting lever 16, whereby the large piston space of the pressure intensifier 5 is set to discharge. The pressure in the cylinder 17 and consequently the pressure on the piston 18 is thereby also reduced, the piston 19 moves the rocking member of the control apparatus 10 in the opposite direction to that in which it was previously moved and the cylinder 6 is set to discharge. The press piston 7 moves downwards under the action of the constant accumulator pressure.

It is of advantage to place the cylinder 12 which is required for closing the mould and is actuated by the two-valve control apparatus 11 also under the influence of the high pressure produced in the pressure intensifier 5 and thus to obtain the requisite high closing force with the use of relatively small piston surfaces, since through the actuation of the foot lever 14 of the control apparatus 8 and the positive actuation of the control apparatus 9 the desired increase in pressure is produced not only in the cylinder 4, but also in the cylinder 12.

I claim:

In a hydraulically driven die-casting machine, a press chamber, a removable closure piece for the press chamber, a mold separate from the press chamber, a piston arranged for feeding the casting material under pressure from the chamber into

the mold, the said closure piece maintaining the press chamber closed during the pressure stroke of the piston, a cylinder, a piston in said cylinder for raising the closure piece from the press chamber and for closing the latter and maintaining it in closed condition during the casting under pressure, the combination with a pressure intensifier, control apparatus for controlling the pressure intensifier, the control apparatus being operable by the closure piece shortly before the latter has reached its closing position to subject the closure member to the pressure of the pressure intensifier, and a second control apparatus controlled by the said pressure intensifier to control the casting pressure stroke of the press piston in the press chamber.

JOSEF POLÁK.