Nov. 11, 1930. G. ECKSTEIN 1,781,451

MEANS FOR MAKING DOUBLE SIDED MOLDS

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Fig. 1

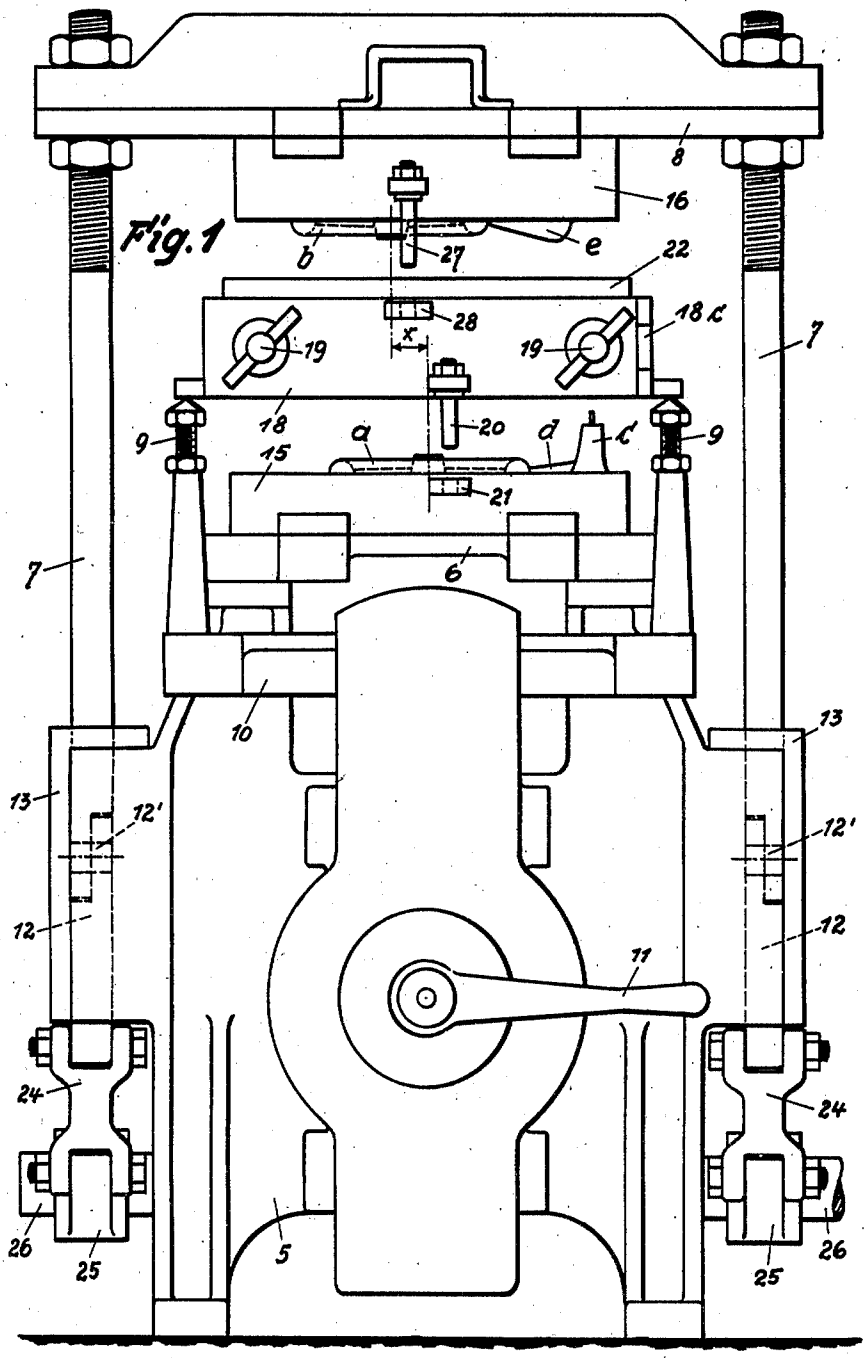

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Fig. 2

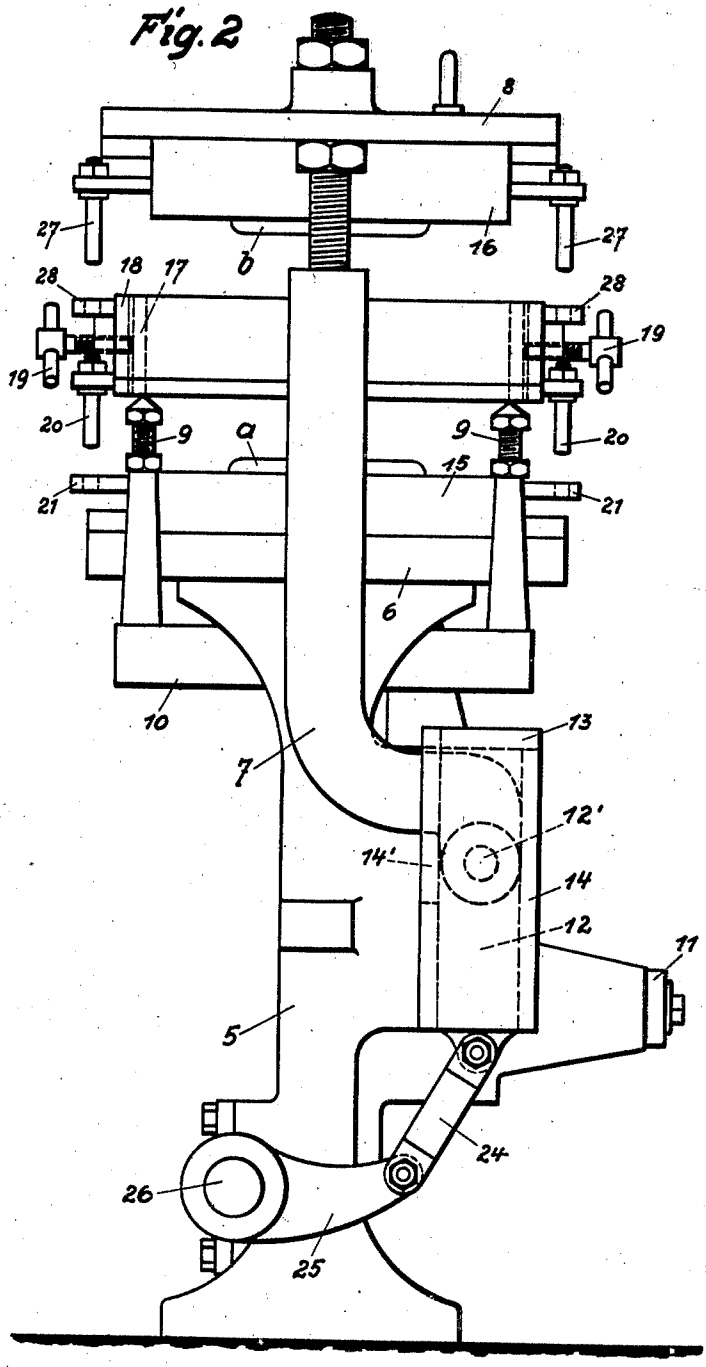

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Fig. 3

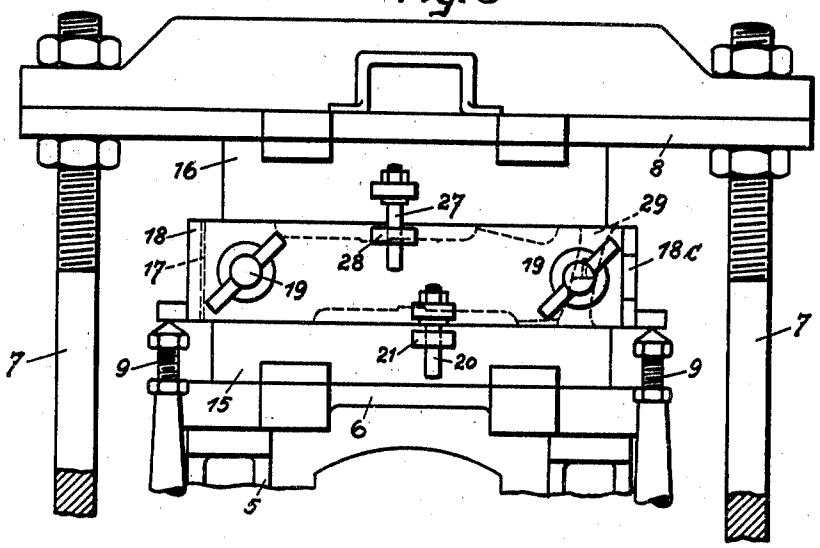
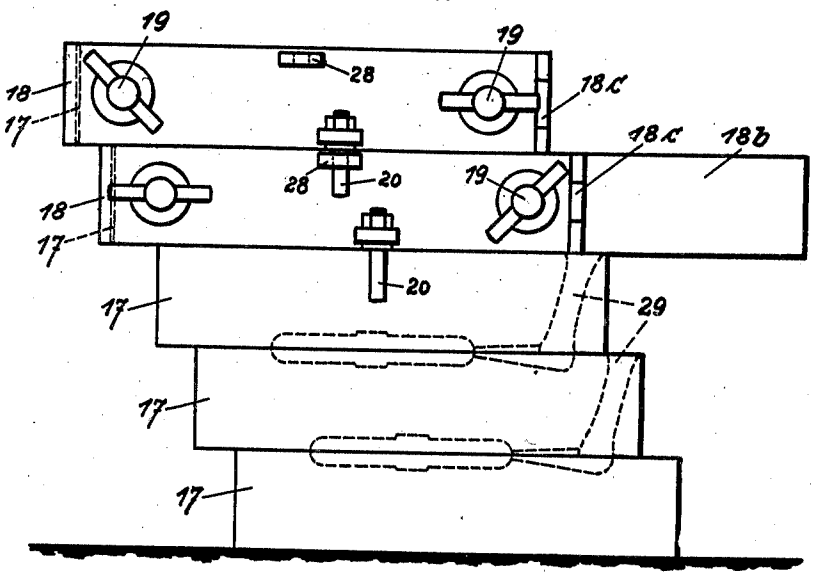


Fig. 4



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UNITED STATES PATENT OFFICE

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MEANS FOR MAKING DOUBLE-SIDED MOLDS

Application filed April 25, 1929, Serial No. 357,996, and in Germany April 27, 1928.

My invention relates to a method and the means for making double-sided molds in a single flask. It is an object of my invention to improve the casting conditions of such molds and to this end I arrange the patterns in staggered relation so that the impressions in the finished molds are also staggered, and the molds on being superimposed will form a sort of step, the gate of each mold being exposed separately, as distinguished from the normal arrangement, in which the gates in the several molds are aligned vertically, forming a gate extending throughout the pile of molds.

In the molding methods as heretofore performed for obtaining double-sided molds in a single flask by impressing pattern plates simultaneously into the upper and lower faces of the sand in the flask, the patterns in the pattern plates were arranged in line, that is, in exact vertical relation to each other. Molds made in this manner can be superimposed only vertically and with a gate extending vertically throughout the pile of molds, runners connecting the gate with the cavities of the several molds. As the metal is poured into the top mold, the ladle is disposed high above the lower molds in the pile so that the metal enters with considerable impetus and the molds, particularly the lower ones, are liable to be damaged.

These drawbacks are overcome according to my invention in which the molds in conformity with their staggered patterns are piled not in vertical but in stepped relation so that the gate of each mold is exposed and each mold may be cast separately. In this manner the ladle is presented to each mold as in any normal mold and not high above its gate, and the metal will enter the mold without damaging it.

In the drawings affixed to this specification and forming part thereof a molding press and a pile of molds embodying my invention are illustrated diagrammatically by way of example.

In the drawings

Fig. 1 is a side elevation, and

Fig. 2 is an end elevation of the press, these figures showing the pattern plates and the flask separated,

Fig. 3 is an elevation of the upper part of Fig. 1, showing the pattern plates in position on the flask,

Fig. 4 is an elevation of a pile comprising five molds in stepped relation.

Referring now to the drawings and first to Figs. 1 to 3, 5 is the machine frame, 6 is the molding table, 15 is the fixed pattern plate on the table with the pattern half *a*, 10 is a spider adapted to be displaced vertically in the frame of the machine by means of a handle 11 and suitable mechanism, which need not be described in detail as it does not form part of the invention. 16 is the movable pattern plate with the pattern half *b*, 18 is a supporting frame for a flask 17, 19 are set screws adapted to hold the flask in the frame, 9 are adjustable supports on the spider 10 for holding the frame 18 and the flask 17, 16 is the movable pattern plate, 8 is a traverse to which the movable plate 16 is secured, 7 are rocking arms extending downwardly from the traverse 8 and threaded at their upper ends for holding the traverse, 12, 12 are slides fitted in guides 14 provided with guards 13, 12′ are pivots in each slide on which the rocking arms 7, 7 are carried, the inner face of each guide being cut away at 14′, Fig. 2, for the admission of the lower end of the rocking arms 7, 26 is a shaft carried in suitable bearings in the lower part of the frame 5, 25, 25 are arms on the shaft 26 and 24 are links connecting each arm with one of the slides 12 so that a rotation of the shaft 26 causes reciprocation of the slides and consequently of the traverse 8 which at the same time is rocked about the pivots 12′ in the slides 12, 12, as will be understood by those skilled in the art.

The flask-supporting frame 18 is provided with a hinged wall 18^b at one end (Fig. 4) which can be rocked about its hinge 18^c in order to insert and remove the flask 17 which is held in position in the frame 18 by set screws 19. At its lower side the flask frame 18 is provided with a pair of pins 20, at its upper side with a pair of eyes 28. *c* is a pattern projecting upwardly from the fixed

plate 15 for forming the gate 29 in the mold, and *d* and *e* are patterns on the respective plates for molding the runner. As will appear from Fig. 1, the patterns *a* and *b* are staggered for a distance *x* with respect to the axis of the machine and the eyes 28 are staggered likewise with respect to the pins 20. 21 are eyes on the fixed plate 15 and 27 are pins on the movable plate 16, the pins 20 engaging the eyes 21 and the pins 27 engaging the eyes 28, when the pattern plates and the mold are engaged by lowering the slides 12, 12 and raising the table 10 by means of the handle 11.

Referring now to Fig. 4 the molds 17 are piled as illustrated. The lowermost mold with its flask frame is placed on the ground. While the flask frame is still connected with the mold, the following flask frame, with the flask therein, is placed on top of it, as shown for the fourth and fifth molds in Fig. 4. On account of the staggering of the pins 20 at the lower side of the respective flask frame 18 and the eyes 28 at its upper side, each upper frame will be staggered with respect to the frame below for the distance *x* (Fig. 1), so that the cavities in the spaces of the molds will register in the proper position, but the front ends of the molds will be stepped so as to expose the gates 29. After two molds have been placed one upon the other in this relation, the flask frame 18 is opened by turning out its wall 18^b, and is removed from the flask, as shown for the three lower molds in Fig. 4. Each mold is poured separately with the ladle in the normal position, so that damage to the runner and to the other parts of the mold by the molten metal is avoided.

I wish it to be understood that I do not desire to be limited to the exact details of construction shown and described for obvious modifications will occur to a person skilled in the art.

In the claims affixed to this specification no selection of any particular modification of the invention is intended to the exclusion of other modifications thereof and the right to subsequently make claim to any modification not covered by these claims is expressly reserved.

I claim:

1. A molding machine comprising two pattern plates, each having a pattern staggered with respect to the pattern in the other plate, a flask frame adapted to be inserted between said plates and to support a flask, means for moving said pattern plates and said flask frame so as to impress said pattern in opposite sides of the sand in said flask, and means for aligning said plates and said flask frame with respect to each other, these means being staggered in conformity with the position of said patterns in their respective plates.

2. A molding machine comprising a frame, a pattern plate on said frame, a movable support on said frame, a pattern plate on said support, a flask frame adapted to be inserted between said pattern plates and to support a flask, means for exerting pressure on said pattern plates and on the mold between them, a pattern in each pattern plate which is staggered with respect to the pattern in the other plate, and means for aligning said plates and said flask frame with respect to each other, these means being staggered in conformity with the position of said patterns in their respective plates.

3. A molding machine comprising a frame, a pattern plate on said frame, a slide guided on said frame, means for reciprocating said slide, a sand guard on said frame for protecting said slide, a rocking frame pivoted on said slide, a pattern plate on said frame, a flask frame adapted to be inserted between said pattern plates and to support a flask, means for displacing said slide so as to exert pressure on said pattern plate and the mold between them, a pattern in each pattern plate which is staggered with respect to the pattern in the other plate, and means for aligning said plates and said flask frame with respect to each other, these means being staggered in conformity with the position of said patterns in their respective plates.

In testimony whereof I affix my signature.

GUSTAV ECKSTEIN.