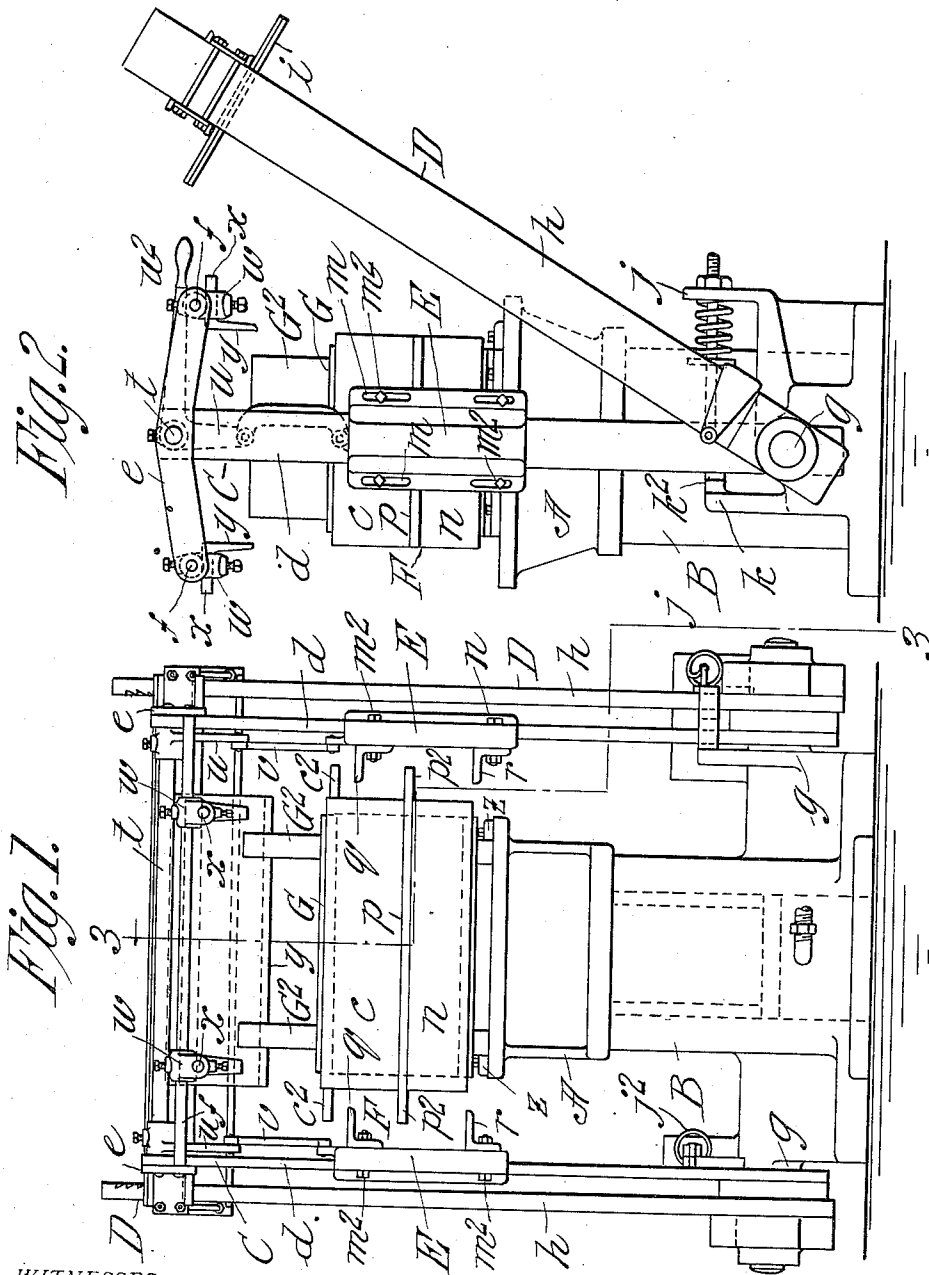


J. M. HANNON.
MACHINE FOR MAKING SAND MOLDS.
APPLICATION FILED MAY 11, 1912.

1,041,274.

Patented Oct. 15, 1912.

2 SHEETS—SHEET 1.



WITNESSES:

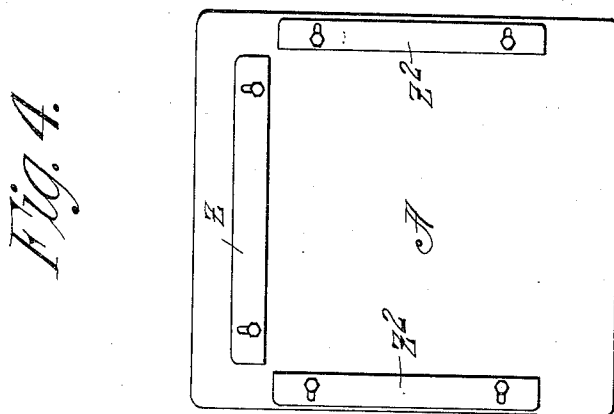
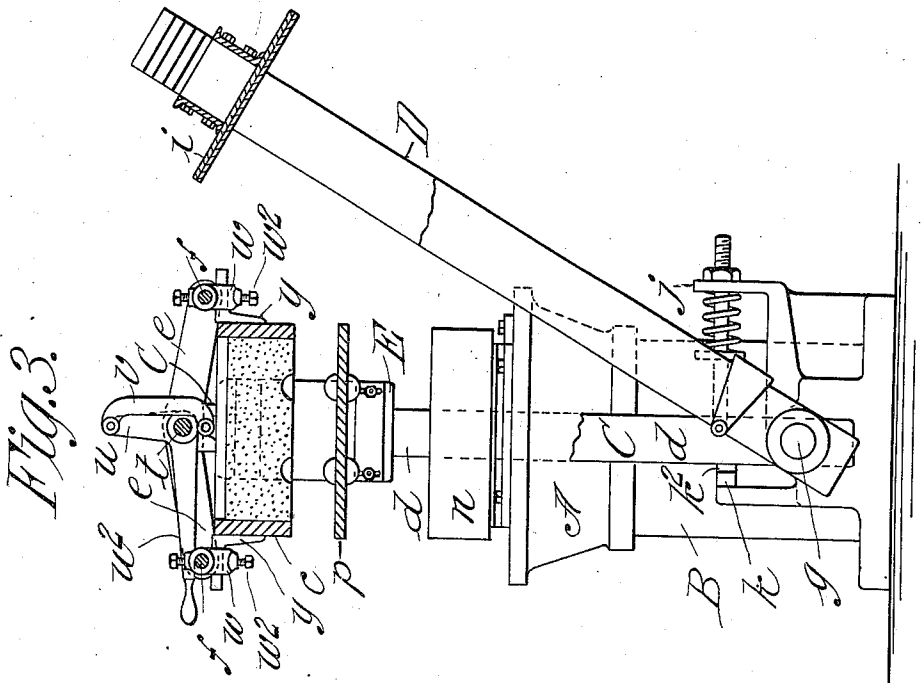
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

JOHN M. HANNON, OF SPRINGFIELD, MASSACHUSETTS.

MACHINE FOR MAKING SAND MOLDS.

1,041,274.

Specification of Letters Patent.

Patented Oct. 15, 1912.

Application filed May 11, 1912. Serial No. 696,632.

To all whom it may concern:

Be it known that I, JOHN M. HANNON, a citizen of the United States of America, and resident of Springfield, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Machines for Making Sand Molds, of which the following is a full, clear, and exact description.

10 This invention relates to a machine or apparatus for the making of sand molds in flasks, usually snap flasks, of a kind in which the cope and nowel thereof together with the pattern plate, when a pattern plate is used, are supported on a bed or table, and under a head bar thereover, the table or bed having means for the elevation thereof so that the mold being made in the flask may be squeezed or rammed when carried by the bed upwardly in relation to the head piece.

15 The object of this invention is to combine in a machine of the general kind above indicated, means for the lifting of the cope portion of the flask away from the portion thereunder, with a true and steady draft, for also lifting the pattern plate away from the nowel; and for the restoration of the cope in relation to the nowel remaining on the bed after the pattern plate shall have been removed, and the cores shall have been set, if cores are employed in the making of the sand molds.

20 Under the exercise of the invention the making of a large number of molds in a comparatively short time may be performed.

25 A further object of the invention is to provide means whereby the machine by the adjustability of certain parts thereof is well adapted for being used in conjunction with flasks of different heights and also of different lengths and widths. And other objects and advantages are attained in and by the combination and arrangement of the parts as will hereinafter be rendered apparent.

30 The invention is described in conjunction with the accompanying drawings and is defined in the claims.

35 In the drawings:—Figure 1 is a front elevation of the improved molding machine; Fig. 2 is a side elevation of the same; Fig. 3 is a sectional view and partial elevation of the machine, the portion in section being as seen on line 3—3, Fig. 1. Fig. 4 is a plan view of the top of the elevator bed showing

adjustable flask gaging bars or plates thereon.

40 In the drawings, A represents the elevator bed or table of a kind commonly employed in machines for making sand molds in flasks and understood as having provided therefor means for its elevation above the base B, such, for instance, as hydraulic means, the particular nature thereof and the means for the controlling of the same involving no novelty herein and will not, therefore, be particularly shown or described.

45 F represents the flask,—*c* denoting the cope portion and *n* the nowel portion; and *p* represents the pattern plate, the ends of which project beyond the ends of the flask as represented at *p*² in Fig. 1; and the cope as usual has the endwise projecting lugs or extensions *c*².

50 C represents a yoke frame, herein termed the "inner yoke", the same comprising opposite members or bars *d d* and transverse uniting means at the top thereof; and as here shown, the inner yoke frame is made at the top with opposite brackets *e*, which intermediately thereof are firmly united to the upper ends of the opposite yoke members *d d*, and project forwardly and rearwardly relatively to the latter; and the extremities of the brackets *e* are united by the horizontal parallel tie bars *f f*. The inner yoke has the opposite barlike members *d d* thereof pivoted on the base portion of the machine on stud or trunnion like journals, the location of which is indicated at *g*, whereby the yoke may be swung to an oblique position offside from the bed of the machine, that is similarly to the position represented in Figs. 2 and 3 for the outer yoke D. The outer yoke D comprises opposite side members *h h* pivotally mounted on the journal studs or trunnions *g g* and the transverse uniting head bar *i*, the dimension of the outer yoke being sufficiently great so as to embrace the inner yoke and so that the one may swing to the offside position independently of and without impediment by the other.

55 *j j*² represent spring buffer devices for yieldingly arresting the yokes when swung to their offside positions, and *k, k*² represents stops for limiting the yokes and accurately positioning them when it is desirable that they shall be brought to their truly vertical relations.

The opposite side members d d of the inner yoke are provided with slides E E which are formed with guideways whereby they are engaged with and adapted for vertical movements relatively to the said yoke members; and these slides are equipped with pairs of cope and pattern plate lifters g g and r r , their normal locations and relations to the cope extension c^2 and the pattern plate end portions being clearly seen in Fig. 1. These lifters are susceptible of having their normal positions rendered variable by reason of being confined in adjusted positions as rendered possible by the provision of the slots m m in the slides, and the headed and nut provided bolts m^2 , m^2 , as shown in Figs. 1 and 2.

At the upper central part of the yoke is mounted a horizontal rockshaft t having duplicated lever arms u rigidly affixed near the opposite ends thereof, u^2 representing an operating lever arm for the rockshaft, and each of the lever arms u u is connected with one of the slides E by link v ,—the lever provided rockshaft and the links connecting it with the slides forming means for raising and lowering the lifters relatively to the inner yoke.

On the tie bars f f of the inner yoke are pairs of depending brackets w w adjustably engaged through which are the horizontal shanks x of depending plate or bar like guide and guard members y , y ,—the set screws w^2 confining these guide and guard members in their adjustments whereby they shall have such separation as to admit of a comparatively close yet sufficiently free sliding fit between them of the flask cope.

The bed A has at its rear a forwardly and rearwardly adjustable gage plate or bar z and at opposite sides thereof similar gage plates or bars z^2 , z^2 , which are adjustable toward and from each other and right angular to the line of adjustment of the rear gage bar,—these provisions being for the positioning of the flask on the bed always properly in relation to the mechanism or device thereabove and which have co-actions with parts of the flask.

In the employment of this machine to make a mold, the cope is first placed on the bed, the pattern plate is placed on the cope, and the nowel on the pattern plate; the nowel is filled with sand and its bottom board is placed therein, and all said parts are turned over; the cope is then filled with sand and the press board G having the comparatively wide cleats G^2 is placed in the top of the cope. In these operations both of the yokes are understood as in their offside oblique positions. The outer yoke is brought to the vertical position, the bed A is caused to be elevated, and the mold is squeezed and made. The outer yoke is now retired. The cleat provided press board is

lifted from the top of the cope and a sprue hole is punched through the sand down to the pattern plate. The inner yoke C is brought forward to its upright position and by means of the operating lever u^2 the lifter slides are operated and the cope is carried upwardly to the position shown in Fig. 3, engaged between the pair of guard and guide members y y and the pattern plate is concurrently therewith raised to its position of separation from the drag; the pattern plate is removed and the inner yoke is swung back, if cores are to be set to give greater freedom of action, and then the inner yoke is again brought to its vertical position and through a return movement of the hand lever u^2 the cope is lowered to its matching relation with the nowel, the lifters g descending below and clear of the cope lug c and the inner yoke is again swung to its offside position. The sand mold made in the flask is removed from the flask,—snap flasks being usually employed for facilitating the removal of the mold; and then the operation for the making of another sand mold may be repeated. When the inner yoke is swung offside for temporarily maintaining the cope in a position of retirement from over the bed it is more or less held against shifting or displacement on the cope lifters by the guard and guide members y y which are in engagement with opposite sides of the cope.

The cleats G^2 , G^2 of the press board insure the proper squeezing of the sand in the flask under a much lessened extent of rising movement of the elevator bed than would be the case if such cleats were not provided.

I claim:—

1. In a machine for making sand molds, in combination, an elevating bed for supporting the separable parts of a flask, a yoke frame embracing and extending above the bed and pivoted thereon and having on the opposite side members thereof slidable cope lifters and also having a rock shaft mounted thereon provided with lever arms and means for rocking such shaft, links connecting the lever arms, and lifters and means for the squeezing of the mold being formed in the flask.

2. In a machine for making sand molds, in combination, a bed for supporting the separable parts of a flask with a pattern plate, a yoke frame embracing and extending above the bed, and pivoted thereon and provided on the opposite side members thereof with cope and pattern plate lifters, one above another, which are slidable on such side members, and also provided with means for slidably operating such cope lifters, and means for the squeezing of the mold being formed in the flask.

3. In a machine for making sand molds, in combination, a bed for supporting the

nowel and cope parts of a flask and the pattern plate, a yoke frame embracing and extending above the bed and pivoted thereon and having slides on the opposite side members thereof provided with cope lifting members and pattern plate lifting members which are vertically and independently adjustable on such slides, and also provided with means for operating the slides, and means for the squeezing of the mold being formed in the flask.

4. In a machine for making sand molds, in combination, an elevating bed for supporting the separable parts of a flask, a yoke frame embracing and extending above the bed, pivotally mounted whereby it may be swung off to one side of the bed, and provided on the opposite side members thereof with cope lifters which are slidable on such side members, and also provided with means for slidably operating such cope lifters, and means above the bed, relatively to which the latter in rising operates, for the squeezing of the mold being formed in the flask.

5. In a machine for making sand molds, in combination, an elevator bed for supporting the separable parts of a flask, a yoke frame embracing and extending above the bed pivotally mounted whereby it may be swung off to one side of the bed and having on the opposite side members thereof slidable cope lifters and also provided with means for slidably operating such lifters, and another yoke,—comprising opposite side members and an upper uniting member pivotally mounted whereby it also may be swung to one side of the bed, and relatively to the upper uniting member of which the elevator bed may operate for the squeezing of a mold being made in the flask.

6. In a machine for making sand molds, in combination, an elevator bed for supporting the separable parts of a flask, a yoke frame embracing and extending above the bed pivotally mounted whereby it may be swung off to one side of the bed and having on the opposite side members thereof slidable cope lifters and also provided with means for slidably operating such lifters, an another yoke,—comprising opposite side members and an upper uniting member, embracing the first named yoke, pivotally mounted whereby it also may be swung to the same side of the bed, and relatively to the upper uniting member of which when the yoke is upright the elevator bed may operate for the squeezing of a mold being made in the flask.

7. In a machine for making sand molds, in combination, an elevating bed for supporting the separable parts of a flask, a yoke frame embracing and extending above the bed, pivotally mounted whereby it may be swung off to one side of the bed, provided on the opposite side members thereof with cope lifters which are slidable on such

side members, also provided with means for slidably operating such cope lifters, and provided at an upper portion thereof with opposite depending members, between which the lifted cope may be engaged, and means above the bed, relatively to which the latter in rising coöperates for the squeezing of the mold being formed in the flask.

8. In a machine for making sand molds, in combination, an elevator bed for supporting the separable parts of a flask, having thereon an adjustable rear, and adjustable opposite side flask gaging bars, a yoke frame embracing and extending above the bed, pivotally mounted whereby it may be swung off to one side of the bed, provided on the opposite side members thereof with cope lifters which are slidable on such members, also provided with means for slidably operating such cope lifters, and provided at an upper portion thereof with opposite depending members, between which the lifted cope may be engaged, and means above the bed relatively to which the latter in rising coöperates for the squeezing of the mold being formed in the flask.

9. In a machine for making sand molds, in combination, an elevator bed for supporting the separable parts of a flask, a yoke frame embracing and extending above the bed, pivotally mounted whereby it may be swung off to one side of the bed, provided on the opposite side members thereof with cope lifters which are slidable on such side members, also provided with means for slidably operating such cope lifters, and provided at an upper portion thereof with opposite depending members, between which the lifted cope may be engaged, said opposite depending members being adjustable toward and away from each other, and means above the bed, relatively to which the latter in rising coöperates for the squeezing of the mold being formed in the flask.

10. In a machine for making sand molds, in combination, an elevator bed for supporting separable flask parts and the pattern plate, a yoke frame embracing and extending above the bed, pivotally mounted whereby it may be swung off to one side of the bed, provided on opposite side members thereof with slides having cope and pattern plate lifters which are vertically adjustable on said slides, and means carried by said yoke frame for imparting rising and falling movements to said slides and said yoke frame being also provided at a lower portion thereof with opposite depending members which are adjustable toward and away from each other, and between which the lifted cope may be engaged, and a second yoke frame embracing the first yoke frame, pivotally mounted to be also swung to one side of the elevator bed and relatively to the upper portion of which the bed in rising, coöperates

for the squeezing of the mold being formed in the flask.

11. In an apparatus for making sand molds, in combination, an elevator bed, a flask the cope portion of which is provided with a press board to fit in the top thereof and having upstanding cleats thereon, a yoke frame embracing and extending above the bed and provided on the opposite side members thereof with cope lifters which are slidable on such slide members, and means for slidably operating the cope lifters and an outer yoke against which the press board cleats engage when the flask is moved upwardly by the bed, said inner and outer yokes being pivotally mounted so as to individually swing to positions offside from the bed.

12. In a machine for making sand molds, in combination, an elevator bed for supporting the separable parts of a flask, a yoke frame embracing and extending above the base pivotally mounted whereby it may be swung off to one side of the bed, and having cope lifters and also provided with means for operating such lifters, and another yoke, comprising opposite side members and an upper uniting member pivotally mounted

whereby it also may be swung to one side of the bed, and relatively to the upper uniting member of which the elevator bed may operate for the squeezing of a mold being made in the flask.

13. In a machine for making sand molds, in combination, an elevator bed for supporting the separable parts of a flask, a yoke frame embracing and extending above the base pivotally mounted whereby it may be swung off to one side of the bed, and having cope lifters and also provided with means for operating such lifters, and another yoke, comprising opposite side members and an upper uniting member pivotally mounted whereby it also may be swung to one side of the bed, and relatively to the upper uniting member of which the elevator bed may operate for the squeezing of a mold being made in the flask, the latter yoke member embracing the first mentioned yoke member.

Signed by me at Springfield, Mass., in presence of two subscribing witnesses.

JOHN M. HANNON.

Witnesses:

WM. S. BELLOWS,
G. R. DRISCOLL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."