Feb. 17, 1925. 1,526,765

J. ANDERSON

PATTERN BOARD REMOVING DEVICE

Filed March 10, 1922 2 Sheets-Sheet 1

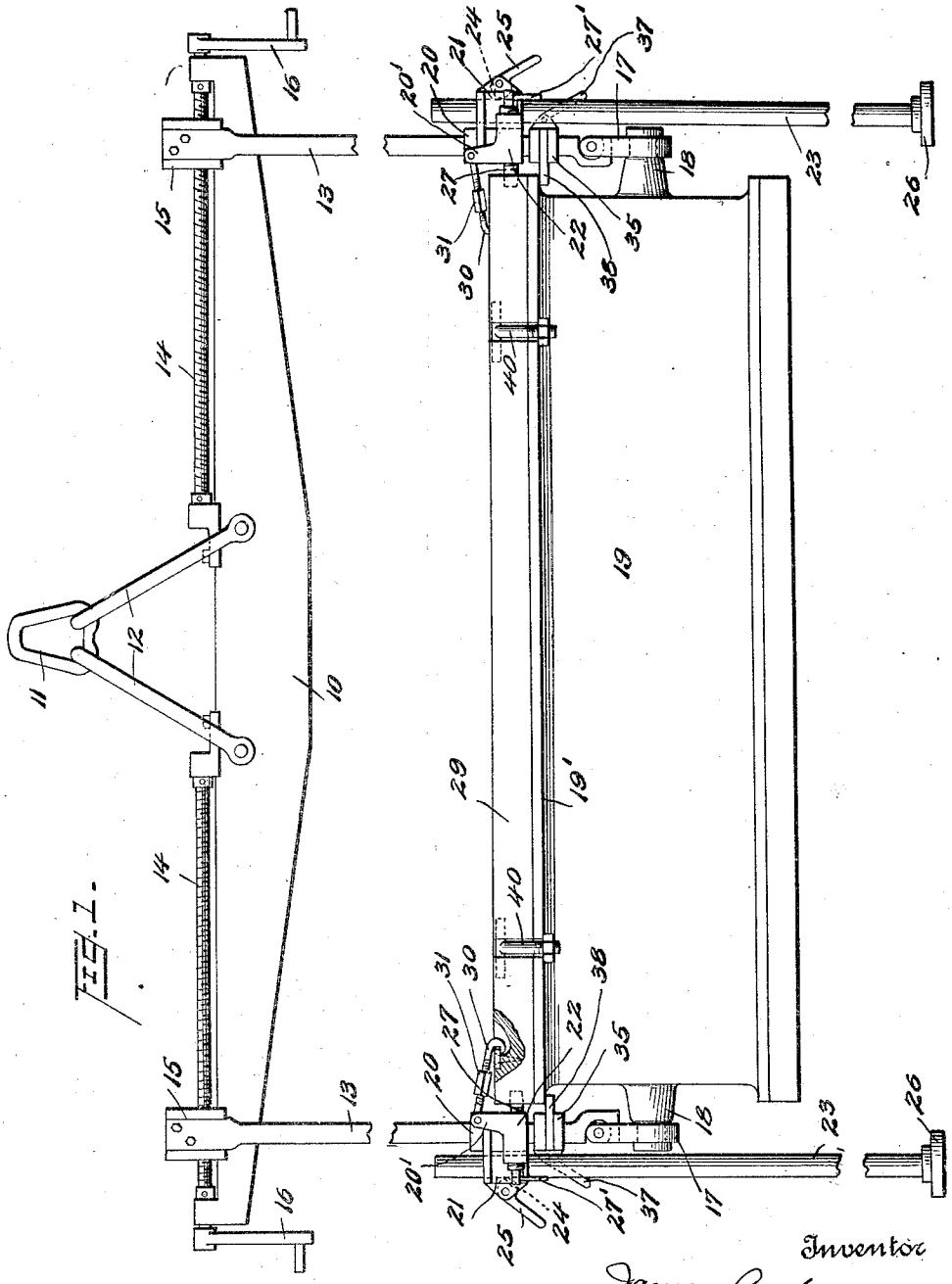


FIG. 1.

Inventor
James Anderson,
By Watson, Coit, Morse & Grindle,
Attorneys.

Feb. 17, 1925. 1,526,765

J. ANDERSON

PATTERN BOARD REMOVING DEVICE

Filed March 10, 1922 2 Sheets-Sheet 2

FIG. 2.

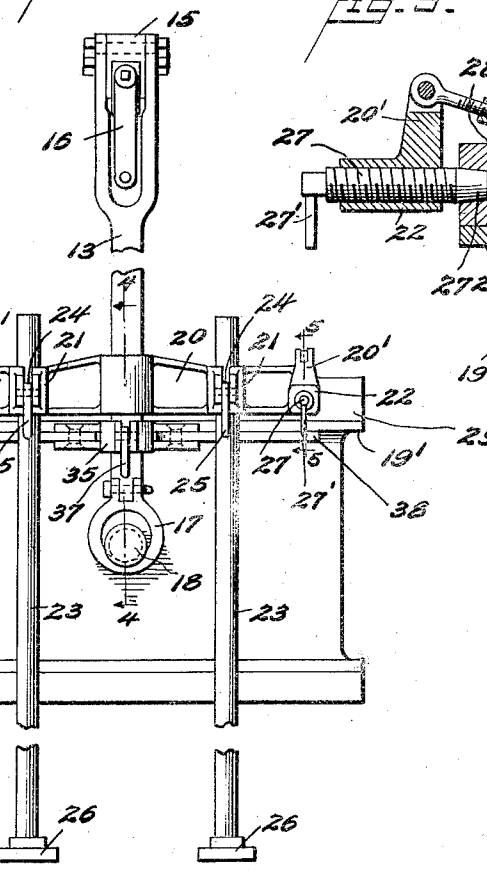


FIG. 5.

FIG. 4.

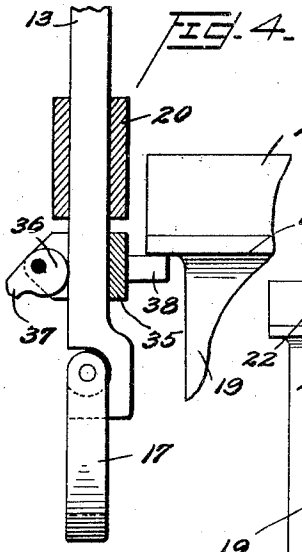
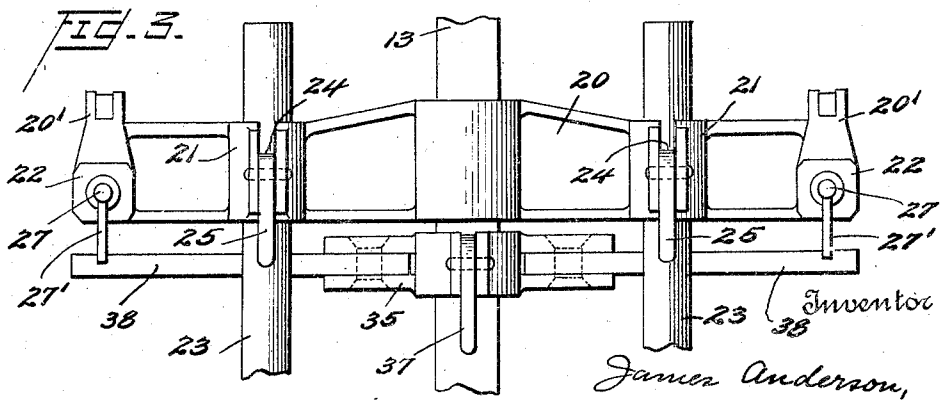


FIG. 3.



Inventor
James Anderson,
By Watson, Cole, Moore & Grindle,
Attorneys.

Patented Feb. 17, 1925. 1,526,765

UNITED STATES PATENT OFFICE.

JAMES ANDERSON, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO BETHLEHEM STEEL COMPANY, OF BETHLEHEM, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

PATTERN-BOARD-REMOVING DEVICE.

Application filed March 10, 1922. Serial No. 542,718.

To all whom it may concern:

Be it known that I, JAMES ANDERSON, a citizen of the United States, and residing at Elizabeth, Union County, State of New Jersey, have invented certain new and useful Improvements in Pattern-Board-Removing-Devices, of which the following is a specification.

The present invention relates to apparatus for removing pattern boards from molds.

The object of the invention is to provide an apparatus of this class which may be readily adjusted to handle molds of various sizes and shapes and to effect the removal of their associated pattern boards without injuring the impression in the sand of the mold, the apparatus being adapted to be transported from place to place in a shop and to be used at any point selected.

The present apparatus is particularly adapted for use in foundries in which castings of large size are fabricated, for handling the large and heavy molds or flasks, but it may also be advantageously used with molds of smaller sizes. The apparatus is preferably suspended from a travelling crane so that it may be moved to any part of a foundry or shop which is accessible to the crane. and is so designed that the separation of the pattern board and mold is affected by moving them relatively in a truly vertical direction, and without necessitating the emplacement of the mold, as a preliminary step, on a platform which has been found or constructed to be horizontal. The apparatus includes means for supporting the pattern board horizontally during the separation, and this means may be called into operation at any point in the shop and will operate successfully to hold the pattern board horizontal notwithstanding any unevenness in the shop floor.

The invention may be embodied in numerous forms one of which is illustrated in the accompanying drawings in which:

Figure 1 is a side elevation of the apparatus showing a mold with its associated pattern board held thereby;

Figure 2 is an end elevation of the same;

Figure 3 is an enlarged end elevation of a portion of the mechanism; and

Figures 4 and 5 are sections on lines 4—4 and 5—5 respectively of figure 2.

A main member or beam 10 is, as shown in Figure 1, hung from a ring 11 by means of straps 12 and ring 11 is in turn supported from a travelling crane by suitable tackle, which is not illustrated, so that the beam 10 may be raised and lowered as desired and transported through the shop. Suspending rods 13 are hung from the ends of the beam 10, the upper ends of the rods being forked and the forks projecting on opposite sides of the beam. Between the upper ends of the forks of each rod 13 is secured a block 15 which slidably rests upon the upper edge of the beam. Threaded rods 14, fixed against longitudinal movement, are rotatably supported above the beam, these rods passing through correspondingly threaded openings in blocks 15 and having operating cranks 16 at their outer ends. Rotation of these cranks results in movement therefor of the suspending rods 13 toward or away from each other along the beam.

Links or eyes 17 are pivotally supported at the lower ends of suspending rods 13, these links being adapted to swing in a vertical plane so as to be readily engaged or disengaged from trunnions 18 at the ends of mold 19. The mold 19 may be of any of the usual sizes, the operator properly positioning the suspending rods 13 by manipulation of the cranks 16 as pointed out. Mounted upon each of the rods 13 is a bracket 20, each bracket having its longitudinal axis at right angles to the corresponding suspending rod and being slidable along the rod in a vertical direction. Normally these brackets 20 rest upon second brackets hereinafter to be described, which second brackets may be clamped to the rods 13 at any desired elevation.

Equidistantly spaced from the center of the bracket are guideways or bushings 21 which receive with a sliding fit the vertically disposed legs 23. Clamping cams 24 operable by handles 25 are provided for clamping the individual legs 23 in any desired adjustment to brackets 20. Each leg is provided with a foot 26 to rest on the floor of the shop. Adjacent the ends of bracket 20 are enlargements or bosses 22 and threaded bolts 27 extend through correspondingly threaded openings in these bushings, the outer ends of the bolts being provided with handles 27′ for turning the same and the inner ends 27^2 being slightly tapered to enter correspondingly tapered openings 28

formed in the ends of the pattern board 29. Pedestals 20′ project upwardly from the brackets 20 above bosses 22, and pivotally secured to the upper ends of these pedestals are hooks 30 which are provided with turn-buckles 31 so as to be extensible. The hooks 30 are adapted to enter cavities in the upper surface of the pattern board 29 and to engage catches 32 secured rigidly to the pattern board. In engaging one of the hooks it is necessary to operate its turn buckle to extend the same, to then place the hook in the depression in the pattern board, and to then shorten the hook by means of the turn-buckle so that the hooked end extends under the catch 32.

A second bracket 35 of smaller size is also slidably supported on each of the suspending rods 13, this bracket having a clamping cam 36 operated by means of a handle 37 for securing the bracket to the rod in any desired position. Pivotally secured to the bracket 35 are arms 38 which are adapted to be swung in a horizontal plane through a limited distance and which, when swung toward the mold 19, will engage the same beneath its upper rim 19′.

In the operation of the apparatus the travelling crane is moved to position the ring 11 centrally above the mold 19, which may be resting upon a jarring machine with pattern board 29 lowermost, it being understood that mold and pattern board are fastened together by the clamps 40. The beam 10 is then lowered toward the mold, the suspending rods 13 adjusted horizontally a distance depending upon the length of the mold, so that rings 17 may be placed over trunnions 18, it being understood that the legs 23 have been adjusted upwardly so that they will not prevent the lowering of the beam and suspending rods the necessary distance.

The beam and mold are then raised by the crane and the mold rotated on its trunnions so that the pattern board 29 is uppermost, the mold and board being turned to truly horizontal position. The arms 38 are then moved toward the mold and when they are in position extending under the rim 19′ the mold cannot be accidentally rotated about the trunnions 18 from its horizontal position. The brackets 20 are moved into position up the rods 13 so that when the bolts 27 are advanced the end portions 27^2 enter the holes in the pattern board formed to receive them, then the hooks 30 are placed in the position indicated in Figure 1. Legs 23 may then be dropped to rest on the floor, and clamped, but before this is done the mold may be transported to any desired point by the travelling crane. The fastenings or clamps 40 securing the pattern board to the mold are loosened, and the beam 10 lowered, thereby lowering the mold 19, while the pattern board 29 remains elevated on legs 23. Hooks 30 prevent longitudinal movement of the pattern board and bolts 27 maintain it in elevated position.

When the mold comes to rest upon the floor or ground the links 17 may be disengaged from trunnions 18, the arms 38 retracted and the beam 10 with the mechanism suspended therefrom, including the pattern board, conveyed to one side by the crane.

One skilled in the art will appreciate the novelty and utility of the apparatus and that the design and arrangement of the component parts may be considerably modified without departure from the spirit of the invention.

Claims:

1. Apparatus for removing pattern boards from molds, including in combination, suspension means for vertically raising and lowering a mold, and second means associated therewith for supporting a pattern board in horizontal position while the mold is lowered.

2. Apparatus for removing pattern boards from molds, including in combination, suspension means for vertically moving a mold and pattern board, and second means associated therewith for supporting a pattern board in horizontal fixed position while the mold is vertically lowered and separated from the pattern board.

3. Apparatus for removing pattern boards from molds, including in combination, suspension means for vertically raising and lowering a pattern board and mold, and second means associated therewith for supporting the pattern board from the floor and in fixed horizontal position while the mold is lowered and separated from the pattern board.

4. Apparatus for removing pattern boards from molds including in combination, suspension means for vertically raising and lowering a mold, and second means associated therewith for supporting the pattern board in horizontal position while the mold is lowered and separated from the pattern board, said second means including members adapted to be locked to the pattern board and legs supporting said members above the floor.

5. Apparatus for removing pattern boards from molds, including in combination, suspension means for vertically raising and lowering a mold and bringing it to horizontal position when raised, and second means for supporting a pattern board in horizontal position while the mold is being lowered.

6. Apparatus for removing pattern boards from molds, including in combintaion, suspension mechanism for raising a mold and bringing it to horizontal position, and associated mechanism to cooperate therewith

in effecting relative vertical movement of the mold and pattern board.

7. Apparatus for removing pattern boards from molds, including in combination, suspension mechanism for raising a mold and bringing it to horizontal position, and associated mechanism to cooperate therewith in effecting relative vertical movement of the mold and pattern board, said associated mechanism comprising means to support the pattern board from the ground.

8. Apparatus for removing pattern boards from molds, including in combination, mechanism for raising a mold and bringing it to horizontal position, and associated mechanism to cooperate therewith in effecting relative vertical movement of the mold and pattern board, said associated mechanism comprising a plurality of members for engaging the pattern board and adjustable means for supporting said members from the floor.

9. Apparatus for removing pattern boards from molds, including in combination, mechanism for raising a mold and bringing it to horizontal position, and associated mechanism to cooperate therewith in effecting relative vertical movement of the mold and pattern board, said associated mechanism comprising members adapted to be secured to the edge of the pattern board and adjustable legs for supporting said members from the floor.

10. Apparatus for removing pattern boards from molds, including in combination, mechanism for raising a mold and bringing it to horizontal position, and associated mechanism to cooperate therewith in effecting relative vertical movement of the mold and pattern board, said associated mechanism comprising two brackets each adapted to be locked to one end of the pattern board and adjustable legs supporting said brackets from the floor.

11. Apparatus for removing pattern boards from molds, comprising in combination, mechanism for raising a mold and bringing it to horizontal position including a horizontally suspended beam and rods hung from said beam for supporting the mold, and associated mechanism to cooperate therewith in effecting relative vertical movement of the mold and pattern board.

12. Apparatus for removing pattern boards from molds, comprising in combination, mechanism for raising a mold and bringing it to horizontal position including a horizontally suspended beam, and rods hung from said beam and adjustable longitudinally thereof, for supporting the mold and associated mechanism to cooperate therewith in effecting relative vertical movement of the mold and pattern board.

13. Apparatus for removing pattern boards from molds, comprising in combination, mechanism for raising a mold and bringing it to horizontal position including a horizontally suspended beam, rods hung from said beam and supporting the mold for rotation about a horizontal axis, means mounted in said rods to prevent rotation of said mold, and associated mechanism to cooperate therewith in effecting relative vertical movement of the mold and pattern board.

14. Apparatus for removing pattern boards from molds, comprising in combination, mechanism for raising a mold and bringing it to horizontal position including a horizontally suspended beam, rods hung from said beam for supporting the mold for rotation about a horizontal axis, means for adjusting said rods longitudinally of the beam to adjust for molds of varying lengths, and associated mechanism to cooperate therewith in effecting relative vertical movement of the mold and pattern board.

In testimony whereof I hereunto affix my signature.

JAMES ANDERSON.