Oct. 6, 1925. 1,556,239

T. A. MIXON

CASTING MACHINE

Filed Feb. 18, 1924 2 Sheets-Sheet 1

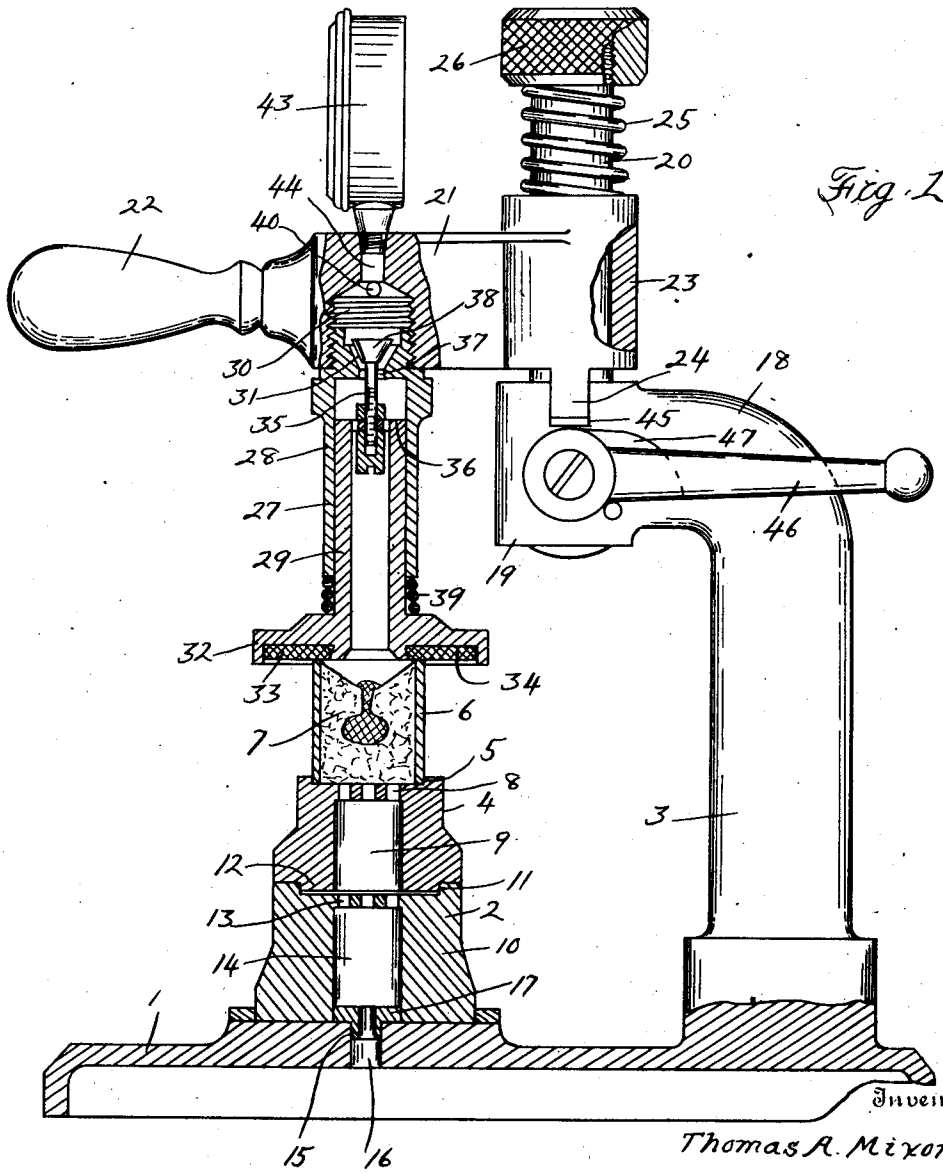


Fig. 1.

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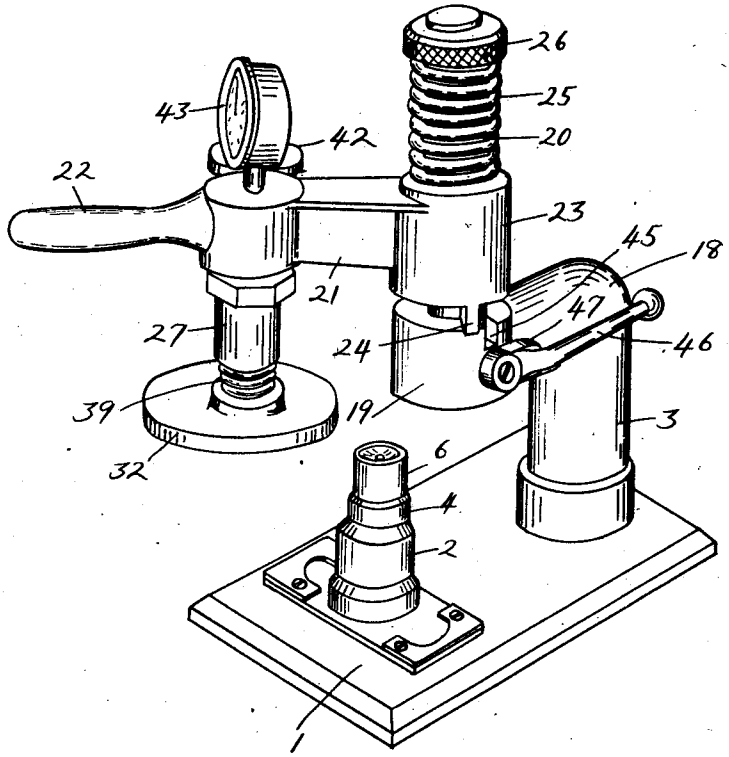


Fig. 2.

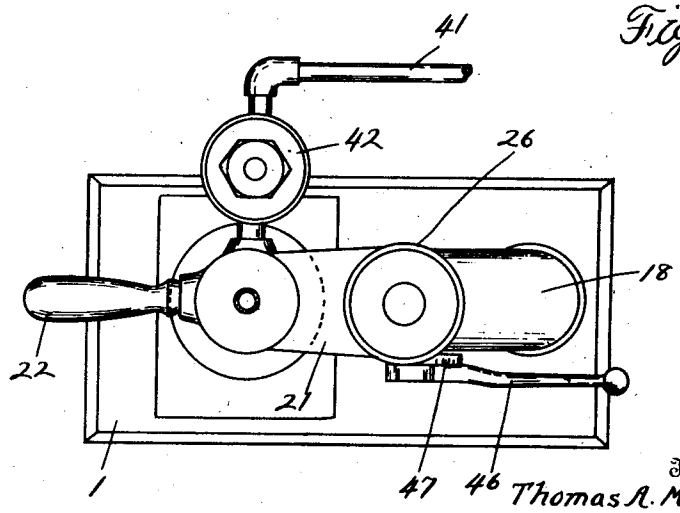


Fig. 3.

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Patented Oct. 6, 1925.

1,556,239

UNITED STATES PATENT OFFICE.

THOMAS A. MIXON, OF DETROIT, MICHIGAN.

CASTING MACHINE.

Application filed February 18, 1924. Serial No. 693,599.

To all whom it may concern:

Be it known that I, THOMAS A. MIXON, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Casting Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates generally to apparatus for making castings and refers more particularly to machines for casting dental fillings of the type known as inlay fillings.

One of the essential objects of the invention is to provide a machine of this type in which a valve casing is provided with a support that will be moved vertically automatically to seat the head of the casing upon a flask containing the mold when the support has been moved horizontally to a position above the flask.

Another important object is to provide simple and effective means for raising the support for the valve casing to unseat the head from the flask and for subsequently moving the support laterally with respect to the flask so that the head will be moved out of the way when not in use.

A further object is to provide an efficient and practical machine in which the valve controlling the passage of the fluid under pressure to the head is opened automatically when the head is seated upon the flask and is closed automatically when the head is unseated from the flask.

With the above and other objects in view the invention consists in certain novel features of construction, combinations and arrangement of parts as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings:—

Figure 1 is a sectional elevation of a machine embodying my invention;

Figure 2 is a perspective view thereof;

Figure 3 is a top plan view thereof.

The numeral 1 designates a base upon which is mounted a sectional mold support 2 and a standard 3. The upper section 4 of the mold support is provided with an annular recess 5 in the upper end thereof for receiving a tubular flask 6 containing the mold 7 and is provided with central perforations 8 that communicate with a longitudinally extending passage 9. The lower section 10 is provided at its upper end with an annular recess 11 for receiving a reduced annular portion 12 of the upper section 4 and is also provided with central perforations 13 that communicate with the passage 9 and with a longitudinally extending passage 14. The lower section is positioned upon the base by means of a tubular pin 15 which engages a vertical opening 16 in the base and which is provided at its upper end with an annular flange 17 that fits within the passage 14 at the lower end thereof.

The standard 3 is preferably provided at its upper end with a horizontally extending elbow 18 having a cylindrical portion 19 at the free end thereof in which a vertical spindle 20 is rigidly secured. Mounted on the spindle 20 for swinging and sliding movement is a horizontal arm 21 having a handle portion 22 at the free end thereof. Projecting laterally from the lower end of the hub portion 23 of the arm 21 is a substantially rectangular shaped lug 24 that slidably engages the flat upper end of the cylindrical portion 19 of the standard elbow. For normally holding the lug in engagement with the cylindrical portion 19 of the elbow there is a coil spring 25 that is sleeved upon the spindle 20 between the hub portion 23 of the arm 21 and a nut 26 threadedly engaging the upper portion of the spindle.

Projecting downwardly from the arm 21 intermediate the ends thereof is a valve casing 27 that is preferably formed of two telescopically arranged sections 28 and 29 respectively. The upper section 28 threadedly engages the walls of a recess 30 in the arm 21 and is provided with a conical valve seat 31 while the lower section 29 preferably fits within the upper section and is provided at its lower end with a flanged head 32 having an annular groove 33 in the lower face thereof in which is mounted an annular packing 34 adapted to engage the upper edges of the flask 6 to form an air tight joint between the parts. The lower section 29 is preferably connected to the upper section 28 by means of a screw 35 that threadedly engages the apertured upper end 36 of the lower section and extends freely through a passage 37 in the upper section 28. The head 38 of the screw is substantially frusto-

conical in shape and forms a valve member for engagement with the seat 31. A coil spring 39 is sleeved upon the lower section 29 between the head 32 and the lower end of the upper section 28 and normally retains the valve 38 in engagement with the seat 31.

Connected to a transversely extending passage 40 in the arm 21 is a tube 41 through which compressed air may be conveyed from a suitable source of supply to the recess 30. A suitable pressure regulator 42 is preferably connected to the tube 41 for controlling the pressure of air passing therethrough while a suitable gauge 43 is preferably connected to a vertical passage 44 in the arm 21 for indicating the pressure of air supplied to the recess 30.

In order that the head 32 at the lower end of the valve casing may be lowered into sealing engagement with the flask 6 and may be centered properly upon the flask when in lowered position, there is a vertical slot 45 in the upper end of the cylindrical portion 19 of the standard elbow for receiving the lug 24 when the arm 21 is positioned over the mold support. When the lug 24 enters the slot 45 the spring 25 will force the arm downwardly and in view of the fact this downward movement of the arm is greater than the distance between the head 32 and the upper edges of the flask 6, the downward movement of the arm 21 will cause the annular packing 34 in the head 32 to seat firmly upon the upper edges of the flask to seal the joint between the head 32 and flask and will also cause the upper section 28 of the valve casing to compress the spring 39 against the head 32 so as to unseat the valve 38 thus permitting compressed air to pass freely through the valve casing from the recess 30 to the flask 6.

Pivotally mounted on one side of the standard elbow 18 is a lever 46 having a cam portion 47 that is adapted to first raise the lug 24 out of the slot 45 and cause the arm 21 to be moved upwardly against the tension of the spring 25 and to subsequently move the lug 24 over the upper end of the cylindrical portion 19 of the standard elbow and cause the arm 21 to be swung laterally with respect to the flask 6. When the arm 21 is moved upwardly the spring 39 will retain the head 32 in engagement with the flask 6 until the upper section 28 of the valve casing is raised so that the valve seat 31 is moved into engagement with the valve 38 to cut off the supply of air from the recess 30 to the flask 6. The head 32 will then be lifted clear of the flask 6 before the arm 21 is swung laterally.

In use, a pattern of the inlay is first formed by placing wax directly into the cavity to be filled so as to secure the contour of the cavity, the pattern is then supported on one end of a suitable sprue former that is attached at its other end to a cover of a flask. This flask is subsequently filled with plastic material that corresponds to the usual sand in ordinary molding and after being permitted to stand for a short time the cover and sprue former are removed leaving a crucible shaped depression and a communicating sprue in the plastic material used for the mold. The flask is then placed over a suitable burner so as to melt the pattern to form the mold and is subsequently placed upon the mold support 2 of the casting machine as shown in Figure 2 of the drawings. After positioning the flask upon the support, a mass of metal of the desired size and material is placed in the crucible shaped depression and is melted by some suitable means such as a blow torch (not shown). The horizontal arm 21, normally in the position shown in Figure 2 of the drawings, is then swung over the mold support so that the lug 24 will enter the slot 45 whereupon the spring 25 will force the arm 21 downwardly, thereby causing the head 32 to seat upon the flask 6 and also causing the valve 38 to be unseated so as to permit compressed air to enter the flask to force the molten metal into the cavity formed by the wax pattern. Any gases that are generated with the result of the compressed air contacting with the molten metal in the flask will be forced downwardly through the apertures and passages in the sections 4 and 10 respectively of the support 2 and will escape through the tubular pin 15 and opening 16 in the base.

After the inlay has been formed the supply of compressed air may be cut off and the head 32 may be removed from the flask 6 by moving the lever 46 so that the cam portion 47 thereof will lift the lug 24 out of the slot 45 and will subsequently swing the arm 21 laterally so that the head 32 will be moved away from the flask.

Should it be desired to vary the pressure of the head 32 upon the flask, the nut 26 may be readily adjusted upon the spindle 20 to vary the tension of the spring 25. Likewise, the operation of the valve 38 may be varied by adjusting the screw 35 in the lower section 29 of the valve casing.

What I claim as my invention is:—

1. In a casting machine, the combination with a flask, of means for supplying air under pressure to the flask, including a valve casing having a head adapted to seat upon the flask, and a support for the casing mounted to move horizontally and vertically whereby the head may be moved over the flask and dropped to seat upon the flask.

2. In a casting machine, the combination with a flask, of a valve casing having a head adapted to seat on the flask, a movable support for the valve casing, yieldable means adapted to move the support to seat the head

upon the flask, and means for varying the tension of said yieldable means to vary the pressure of the head upon said flask.

3. In a casting machine, the combination with a flask and a standard, of an arm mounted on the standard for vertical and horizontal movement, a valve casing secured to the arm and having a head adapted to seat on the flask, a lug, said standard having a slot adapted to receive the lug when the head carried by the arm is moved horizontally to a position above the flask, and means for moving the arm vertically when the lug registers with the slot to seat the head upon the flask.

4. In a casting machine, the combination with a standard, of a spindle carried by the standard, an arm mounted on the spindle for both swinging and sliding movement, a lug upon the arm, said standard having a slot adapted to receive the lug when the arm is swung upon the spindle, a yieldable member for sliding the arm upon the spindle when the lug registers with the slot, and a lever pivoted on the standard and having a cam portion engageable with the lug to disengage the same from the slot and swing the arm about the spindle.

5. In a casting machine, the combination with a standard, of a spindle carried by the standard, an arm mounted on the spindle for both swinging and sliding movement, a lug upon the arm, said standard having a slot adapted to receive the lug when the arm is swung upon the spindle, and means for sliding the arm upon the spindle when the lug registers with the slot.

6. In a casting machine, the combination with a flask and a standard, of a member mounted on the standard for both horizontal and vertical movement, means for supplying air under pressure to said flask, including a valve casing secured to said member and having a head adapted to seat upon the flask, means for moving the member horizontally to position the head above the flask, and means for moving the member vertically when the head is over the flask to seat the said head on the flask.

7. In a casting machine, the combination with a standard, of a member mounted on the standard for both vertical and horizontal movement, means for moving the member horizontally, means for moving the member vertically in one direction when the same reaches a predetermined point during its horizontal movement, and a single means for moving the member vertically in the opposite direction and for subsequently moving the same horizontally.

8. In a casting machine, the combination with a standard, of a member mounted on the standard for both vertical and horizontal movement, means for moving the member horizontally, means for moving the member vertically in one direction when the same reaches a predetermined point during its horizontal movement, and cam operated means for moving the member vertically in the opposite direction and for subsequently moving the same horizontally.

9. In a casting machine, the combination with a standard, of a member mounted on the standard for both vertical and horizontal movement, means for moving the member horizontally, means for moving the member vertically in one direction when the same reaches a predetermined point during its horizontal movement, and a cam for moving the member vertically in the opposite direction and for subsequently moving the same horizontally.

10. In a casting machine, the combination with a flask, of a valve casing having a head engageable with the flask, a support for the valve casing mounted to move horizontally and vertically, means for supplying a fluid under pressure to the support, a valve in the casing for controlling the passage of the fluid from the support to the flask, means for moving the support horizontally to position the head above the flask, means for moving the support vertically when the head is above the flask to seat the said head on the flask, and means for actuating the valve when the support is moved vertically.

11. In a casting machine, the combination with a standard, of a spindle carried by the standard, an arm mounted on the spindle, a lug upon the arm, the standard having a slot to receive the lug, an adjustable member on the spindle, and a coil spring sleeved upon the spindle between the adjustable member and arm.

12. In a casting machine, the combination with a standard, of a horizontally swingable arm mounted on the standard, said arm having a recess, a valve casing secured to the walls of the recess, and means for supplying a fluid under pressure to said recess.

13. In a casting machine, the combination with a flask, of a valve casing having a head adapted to seat upon the flask, a support for the casing adapted to move horizontally and vertically, means for moving the support horizontally to position the head above the flask, and means for automatically seating the head upon the flask when the head is above the flask.

14. In a casting machine, the combination with a flask, of a valve casing having a head adapted to seat upon the flask, a support for the casing adapted to move horizontally and vertically, means for moving the support horizontally to position the head above the flask, a yieldable member for automatically seating the head upon the flask when the head is above the flask, and means for moving the support vertically to unseat the head from the flask and for subsequently swing-

ing the support horizontally to move the head away from the flask.

15. In a casting machine, the combination with a flask, of a horizontally swingable arm movable above the flask, a sectional casing adapted to receive air under pressure, the sections of the casing being telescopically arranged, one section being secured to said support, the other section having a head adapted to engage said flask, a valve carried by one section and engaging a seat in the other section, and means located between one section and the head of the other section for normally retaining said valve in engagement with its seat.

16. In a casting machine, the combination with a flask, of a valve casing having a head adapted to seat upon the flask, a support for the casing adapted to move horizontally and vertically, means for moving the support horizontally to position the head above the flask, means for moving the support vertically in one direction to seat the head upon the flask, means for moving the support vertically in the opposite directions to unseat the head from the flask and for subsequently swinging the support horizontally to move the head away from the flask, and a valve in the casing adapted to be opened when the support is moved vertically in one direction and adapted to be closed when the support is moved vertically in the opposite direction.

17. In a casting machine, the combination with a flask, of a valve casing having a head adapted to seat upon the flask, a support for the casing adapted to move horizontally and vertically, said support having a passage in communication with the casing, means for supplying a fluid under pressure to the passage in the support, a valve normally seated in the casing for cutting off the supply of fluid to the flask, means for moving the support horizontally to position the head above the flask, means for moving the support vertically in one direction to seat the head upon the flask, means for unseating the valve when the head is seated on the flask, and means for moving the support vertically in the opposite direction to seat the valve in the casing and unseat the head from the flask.

18. In a casting machine, the combination with a flask, of a vertically movable casing adapted to seat upon the flask, said casing having a passage for supplying air under pressure to the flask when said casing is seated thereon, a horizontally movable support for the casing having a passage in communication with the passage aforesaid, and means for supplying a fluid under pressure to the last mentioned passage.

19. In a casting machine, the combination with a flask, of a vertically movable casing adapted to seat upon the flask, said casing having a passage for supplying air under pressure to the flask when said casing is seated thereon, a movable support for said casing having a passage in communication with the passage aforesaid, means for supplying a fluid under pressure to the second passage, and means in one of said passages for controlling the supply of fluid to said flask.

20. In a casting machine, the combination with a flask, of means for supplying air under pressure to the flask, including a valve casing having a head engageable with the flask, and a valve in the casing for controlling the supply of air to the flask, a horizontally and vertically movable support for the valve casing, means for moving the support horizontally to position the head above the flask, means for moving the support vertically when the head is above the flask to seat the said head on the flask, and means for actuating the valve when the support is moved vertically.

21. In a casting machine the combination with a standard and a flask, of an arm mounted on the standard for both vertical and horizontal movement, a casing carried by the arm adapted to seat upon the flask, means for moving the arm horizontally to position the casing over the flask, means for moving the arm vertically in one direction to seat the casing upon the flask, and means for moving the arm vertically to unseat the casing and subsequently move the same laterally of the flask.

22. In a casting machine, the combination with a standard and a flask, of an arm mounted on the standard for both vertical and horizontal movement, a casing carried by the arm adapted to seat upon the flask, means for moving the arm horizontally to position the casing over the flask, means for moving the arm vertically in one direction to seat the casing upon the flask, and cam operated means for moving the arm vertically to unseat the casing and subsequently move the same laterally of the flask.

23. In a casting machine, the combination with a standard and a flask, of a horizontally swingable arm mounted on the standard having a passage therein, means for supplying air under pressure to the passage, a casing carried by the arm in communication with the passage, means for seating the casing upon the flask, and means in said casing for admitting air under pressure from the passage in the arm to the flask when the casing is seated.

24. In a casting machine, the combination with a flask containing a mold having a cavity, and a depression in communication with the cavity adapted to receive molten metal, of means for forcing the molten metal from the depression into the cavity including a horizontally movable casing

adapted to seat upon the flask, and having a passage adapted to communicate with the depression aforesaid, and means for supplying air under pressure to the passage in the casing.

25. In a casting machine, the combination with a flask containing a mold having a cavity, and a depression in communication with the cavity adapted to receive molten metal, of a closure for the flask having means for conveying a fluid under pressure to the depression in the mold to force the molten metal from the depression into the cavity, a standard, and a support for said closure mounted to move horizontally and vertically upon said standard.

26. In a casting machine, the combination with a flask containing a mold having a cavity, and a depression in communication with the cavity adapted to receive molten metal, of a casing adapted to seat upon the flask having a passage adapted to communicate with the depression aforesaid, means for supplying air under pressure to the passage in the casing, a standard, a support for said casing mounted to move horizontally and vertically upon said standard, means for moving said support horizontally in one direction to position the casing above the flask, means for moving the support vertically in one direction to seat the casing upon the flask, and a single means for moving the support vertically in the opposite direction to unseat the casing and subsequently move the support horizontally to swing the casing laterally with respect to the flask.

27. In a casting machine, the combination with a flask, of a casing adapted to seat upon the flask, of a support for the casing mounted to move vertically and horizontally, means for moving the support horizontally to position the casing above the flask, means for moving the support vertically to seat the casing upon the flask, and a common means for moving the support vertically to unseat the casing and subsequently move the support horizontally to swing the casing laterally with respect to the flask.

28. In a casting machine, the combination with a flask, of a casing adapted to seat upon the flask, means for supplying air under pressure to the casing, a valve member for controlling the supply of air to said casing, a support for said casing mounted to move horizontaly and vertically, and means for actuating said valve when said support is moved vertically.

29. In a casting machine, the combination with a flask, of a valve casing mounted for movement into and out of operative relation with the flask, and means for automatically effecting engagement between the flask and casing when operative relation between the parts has been established.

30. In a casting machine, the combination with a flask, of a valve casing mounted for horizontal movement relative to the flask, and means for automatically seating the casing upon the flask after it has been moved horizontally into alignment with the flask.

31. In a casting machine, the combination with a flask, of a valve casing mounted for both horizontal and vertical movement relative to the flask, and means for automatically moving the casing vertically to seat the same upon the flask after the said casing has been moved horizontally into alignment with the flask.

32. In a casting machine, the combination with a flask, of means for supplying air under pressure to the flask including a valve casing mounted for movement into and out of operative relation with the flask, a valve in the casing controlling the passage of air therethrough, means for automatically seating the casing upon the flask when operative relation between the casing and flask has been established, and means for automatically actuating the valve to permit air under pressure to the flask when the casing is seated upon the flask.

33. In a casting machine, the combination with a flask, of means for supplying air under pressure to the flask including a valve casing mounted for both horizontal and vertical movement, means for moving the casing horizontally to position the same over the flask, means for automatically seating the casing upon the flask when the casing has been positioned over the flask, a valve in the casing controlling the passage of air therethrough, and means for automatically actuating the valve to permit air under pressure to pass to the flask when the casing is seated upon the flask.

34. In a casting machine, the combination with a flask, of a valve casing adapted to be moved into alignment with the flask, means for automatically seating the casing upon the flask when in alignment therewith, and a single means for unseating the casing from the flask and for subsequently moving the same laterally of the flask.

35. In a casting machine, the combination with a flask, of means for supplying air under pressure to the flask including a valve casing mounted for both horizontal and vertical movement with respect to said flask.

In testimony whereof I affix my signature.

THOMAS A. MIXON.