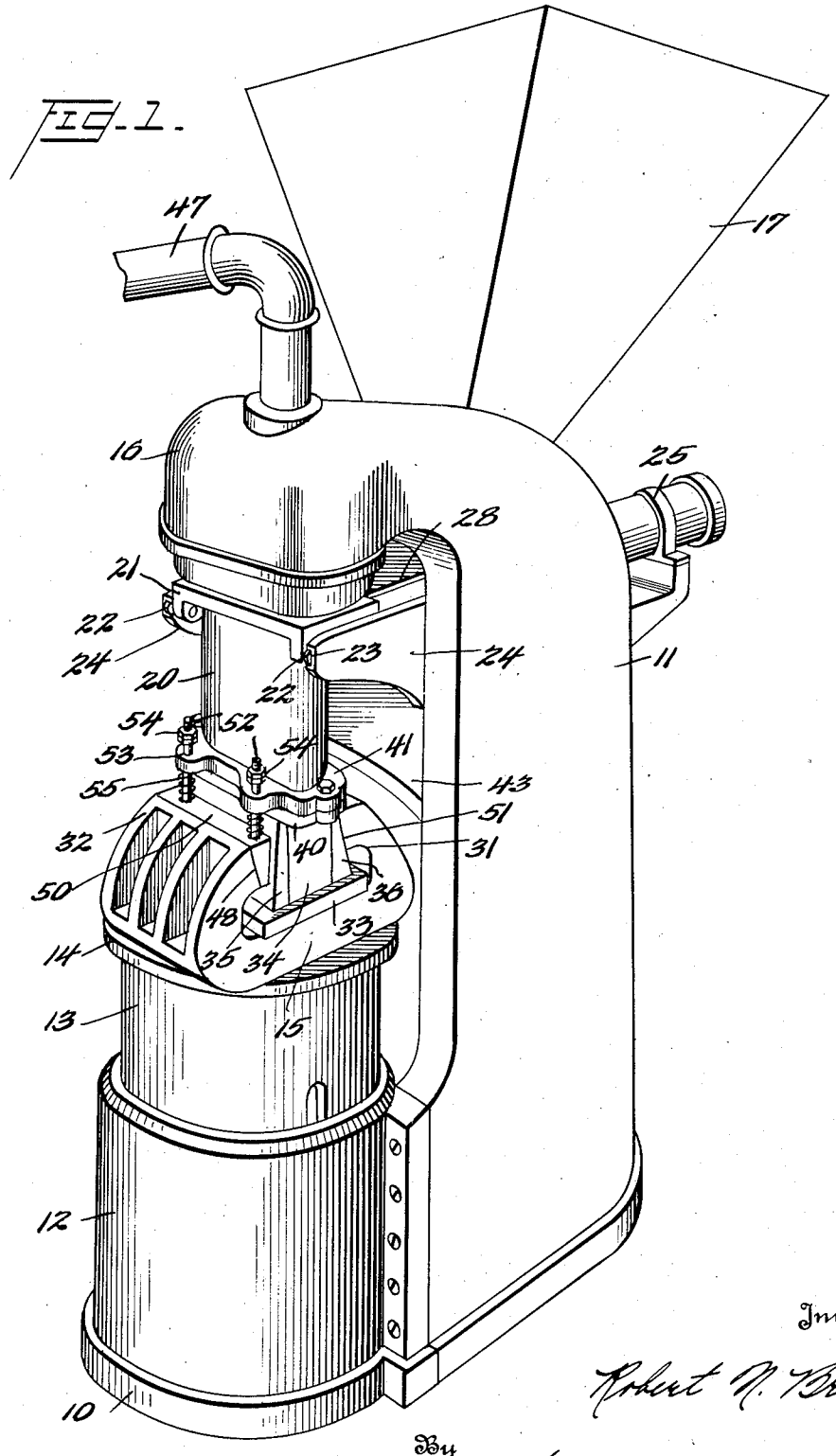
June 2, 1931. R. N. BROWN 1,808,630

CORE FORMING MECHANISM

Filed Feb. 27, 1930 2 Sheets-Sheet 1

FIG. 1.



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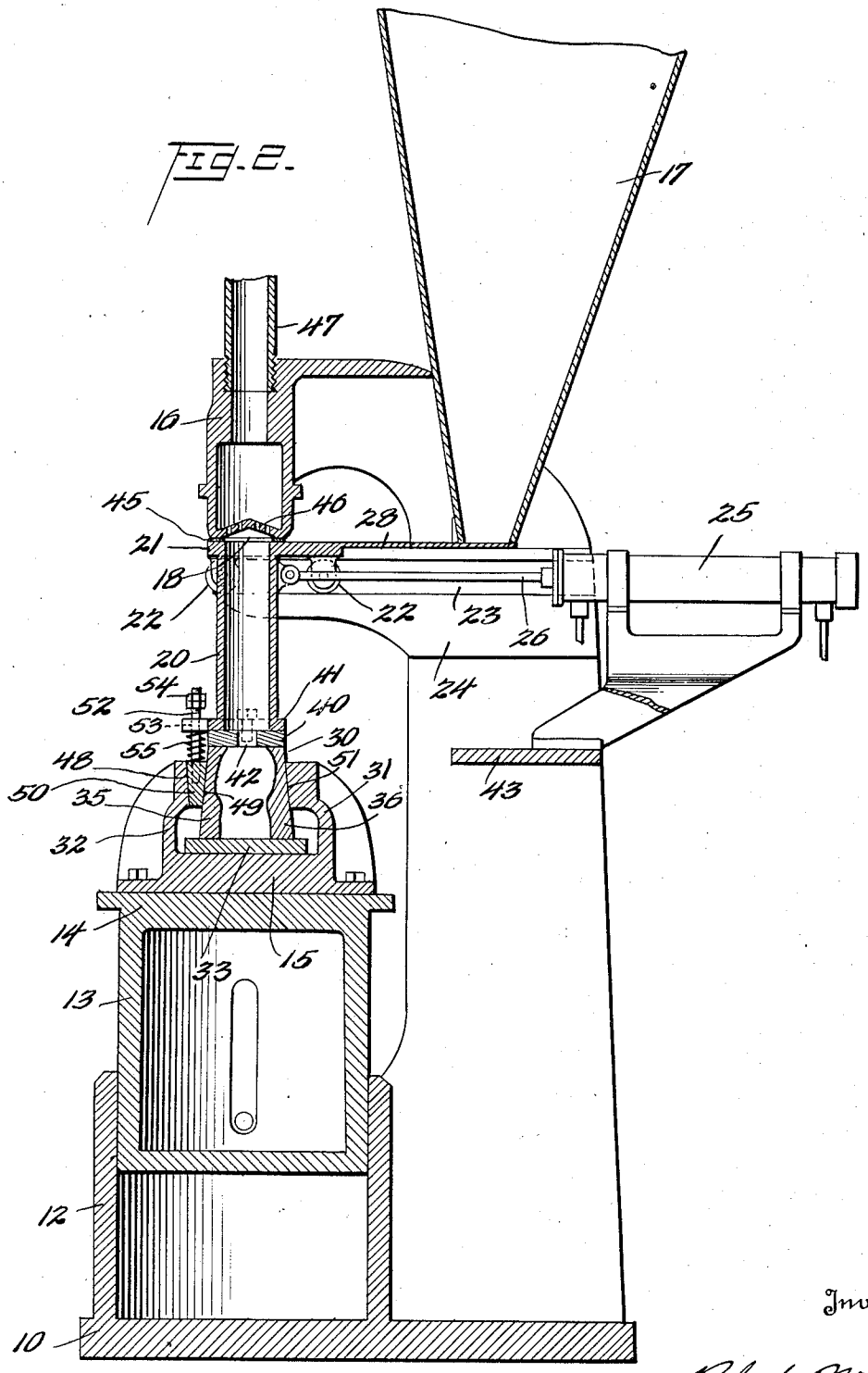
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CORE FORMING MECHANISM

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Fig. 2.



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UNITED STATES PATENT OFFICE

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CORE FORMING MECHANISM

Application filed February 27, 1930. Serial No. 431,935.

This invention relates to sand core forming means and more particularly to means for holding and clamping the parts of a collapsible core form or box during the operation of blowing sand therein.

It is a general object of the present invention to provide a novel and improved core forming mechanism.

One of the important features of the invention comprises the use of a yoke to receive and engage the parts of a collapsible core box together with means on a sand transfer member for cooperating with both the yoke and the core box to tightly clamp the parts thereof together.

Another feature of the invention comprises the arrangement of a yoke with upwardly extending arms, mounted on a movable platform and adapted to receive the bottom and sides of a collapsible core form, together with a movable sand conveyor which can be positioned above the core box and which is provided with a cover for the same and means to pass between the core box and at least one of the arms of the yoke to wedge the core box parts tightly together.

Other and further features and objects of the invention will become more apparent to those skilled in the art upon a consideration of the accompanying drawings and following specification, wherein is shown a single exemplary embodiment of the invention, with the understanding, however, that such changes may be made therein as fall within the scope of the appended claims without departing from the spirit of the invention.

In said drawings:

Figure 1 is a perspective view of a core blowing machine showing the present invention incorporated therein; and

Figure 2 is a fore and aft vertical section through the machine.

Referring to the drawings it will be seen that the machine comprises a base 10 supporting a pair of spaced vertical columns 11. Attached to the base and the forward edge of the vertical columns is a pneumatic cylinder 12 and operating therein is a piston 13 having a top or table 14 carrying the yoke 15 secured thereto. The upper ends of the columns are inclined forwardly and merge into the hollow blowing head 16 which is directly positioned above the center of the table 14.

A sand hopper 17 is mounted on the columns to the rear of the blowing head and has its open mouth at the same level as the mouth 18 of the blowing head which is open. This hopper is adapted to contain a suitable core sand, preferably a natural bond sand and may be provided with any convenient form of rapper to insure a steady flow of sand from the hopper when desired.

A sand conveyor or transfer member 20, in the form of a hollow elliptical cylinder is movable from a position beneath the hopper mouth to a position beneath the blowing head and for this purpose the transfer member 20 is supported from a frame 21 provided with rollers 22 loosely running in ways 23 in the guides 24 supported between the columns. A suitable pneumatic cylinder 25 is provided with a piston attached to the conveyor by means of the piston rod 26. The cylinder is conveniently supplied with compressed air by means of a selective valve to either end thereof to move the conveyor from one position to the other. The back of the frame 21 is extended as at 28 to form a closure slide for the mouth of the hopper when the conveyor is moved away.

In its forward position the sand transfer member is directly over the open mouth of the core box form 30 which is adapted to be received between the arms 31 and 32 of the yoke 15. The collapsible core box may be of any desired construction and usually includes a bottom plate 33 resting on the bottom of the yoke, suitable end plates 34 and side plates 35 and 36. The interior configuration of the box to form the desired core shape is effected by the shape of the inner walls of these bottom, end and side plates. The plates conveniently fit together with the ends between the sides and held by dowel pins or merely have engaging tongues and grooves so that they can be quickly assembled and then disassembled after the core is formed so that it can be removed intact.

With the core box parts in position on the yoke, with the piston 13 lowered and the sand

transfer member beneath the hopper, sand may be delivered into this transfer member by gravity until it is full, when air is admitted to the head end of the cylinder 25 and the transfer member moved to the position shown in Figure 2, at which time the slide 28 will close the bottom of the hopper. Air is then admitted into the cylinder 12 so that the piston 13 is lifted and together with it the yoke and core box. This causes the upper edges of the core box sides and ends to engage with the plate 40 which is secured to the peripheral flange 41 on the bottom of the sand transfer member. This plate 40 has one or more small openings 42 therein through which the sand is blown into the core box, but these openings are of such size that the normal consistency of the sand prevents it from falling through, particularly since the plate 40 may rest on the spacing web 43, between the columns 11, when the sand conveyor is being filled.

When the piston 13 is raised to engage the core box with the plate 40, the whole sand transfer member is slightly elevated due to the looseness of the rollers 22 in their ways so that the upper end of the sand transfer member, which already registers with the opening in the blowing head, is caused to tightly engage it and form an air-tight joint with the assistance of a gasket 45 if desired. The blowing head is provided with a suitable perforated baffle 46 and an air inlet conduit 47 so that air can be blown at great pressure and properly distributed over the surface of the sand in the transfer member to blow it into the core box which is perforated in a number of places, not shown, to permit of the escape of the air as the sand is deposited to form the core. Under the high pressure of the air the sand is driven through the openings 42 in the plate 40 and delivered into the core box.

It is highly desirable, in order to facilitate operations, that the core box be arranged to be clamped together without any separate means being applied thereto for the purpose. It must be held quite securely together during the blowing operation, owing to the high pressure of air needed to properly deposit the natural bond sand, and for this purpose it is convenient to have one arm of the yoke, preferably 31 with a face 51 of such shape as to engage over a large area of the side plate 36 of the core box form and to have the corresponding face 48 on the opposite arm of the yoke inclined as shown opposite to the inclination of the outer face 49 of the side member 35 of the core box. A wedge 50 is then provided of the proper inclination to fit between the surfaces 48 and 49 so that when the wedge is tightly pressed in place the core box is securely clamped between it and the opposite arm of the yoke.

The wedge 48 has mounted thereon a pair of rods 52 which operate in holes 53 in the extensions of the flange 41 on the bottom of the sand transfer member. The rods may be conveniently provided on their upper ends with stop nuts 54 to engage with the upper surface of the flange as the yoke is lowered to assist in withdrawing the wedge. Mounted on the rods between the undersurface of the flange 41 and the upper face of the wedge 50 are the strong coil springs 55 which are instrumental in forcing the wedge into position as the yoke is elevated to bring the upper edges of the core box in engagement with the closure plate 40 therefor on the sand transfer member.

It will be understood that suitable valves and controls are provided to admit air to the respective ends of the cylinder 25 and to the main cylinder 12 which lifts the yoke and the core box. The vertical movement of the yoke and the core box may also provide for lowering the core box to such a position that it can be conveniently slid off onto conveyors such as the conventional roller conveyors which thus eliminates handling of the heavy parts any more than necessary and permits the core in its box to be rolled away for further treatment and use. It will be understood that it is also necessary to lower the yoke in order that the sand transfer member will be free to move back to the hopper for additional sand so that the core box will not interfere with the wedge carried on the transfer member.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A core forming machine including, in combination, a vertically movable core box support, a yoke thereon to receive the parts of the collapsible core box between its arms, a sand transfer member laterally movable over the core box when the support is lowered, and a wedge device on said member to pass between the core box and one of the yoke arms to clamp the core box parts together when the support is elevated to bring the core box in engagement with the transfer member.

2. A core forming machine including, in combination, a base, a table vertically movable in respect to said base, a yoke secured to said table and having spaced arms to receive a collapsible core box, a blowing head rigidly supported from said base above the said yoke, a sand transfer member laterally movable to a position beneath said head and over said yoke, means on said transfer member to close the top of said core box when the table is elevated to engage the core box with the transfer member and press the transfer member into engagement with said head, and means on said transfer member to cooperate with the yoke and core box to clamp the parts of the core box together as the table is elevated.

3. A core forming machine including, in combination, a vertically movable yoke having spaced arms to receive a collapsible core box, a blowing head rigidly supported above said yoke, a sand transfer member movable to a position between said head and core box, means on said transfer member to close the top of the core box, means on the transfer member to cooperate with the core box parts and the yoke to clamp the core box together, and means to elevate the yoke when the transfer member is above it to force the core box, transfer member, and head into cooperating engagement.

4. A core forming machine including, in combination, a vertically movable member adapted to receive a collapsible core box, a blowing head aligned with the movable member, a movable sand receptacle adapted to register with the blowing head and the core box, and means on said receptacle to cooperate with the movable member and the core box to clamp the core box together when the movable member is raised to engage the core box and receptacle.

5. A core forming machine including, in combination, a vertically movable member adapted to receive a collapsible core box, a blowing head aligned with the movable member, a movable sand receptacle adapted to register with the blowing head and the core box, and resiliently mounted means on said receptacle to cooperate with the movable member and the core box to clamp the core box together when the movable member is raised to engage the core box and receptacle.

6. A core forming machine including, in combination, a vertically movable member adapted to receive a collapsible core box, a blowing head aligned with the movable member, a movable sand receptacle adapted to register with the blowing head and the core box, and a wedge on said receptacle to force the core box into lateral engagement with the movable member when the movable member is elevated to press the core box against the receptacle and the receptacle against the blowing head.

7. A core forming machine comprising a vertically movable member adapted to receive a core form, a blowing head, a sand receptacle adapted to periodically register with the form on the movable member and the blowing head, wedge means on said receptacle to clamp the parts of the form as the member is elevated, and means to elevate the movable member.

8. A core forming machine comprising a vertically movable piston, a yoke on the top of said piston to loosely receive the parts of a core form, a head above said yoke, a sand receptacle movable to a position between said head and yoke when the yoke is lowered, means to move the piston and yoke upwardly to engage the form with the receptacle, and means associated with said receptacle to engage the yoke and form to press them into tight engagement laterally when the yoke is elevated.

9. A core forming machine comprising a vertically movable yoke to loosely receive the parts of a core form, a sand receptacle movable laterally from and to a position over said yoke when the yoke is lowered, means on said receptacle to close the top of said form, means associated with said receptacle to engage the yoke and form to press the form parts tightly together when the yoke is elevated, and means to raise and lower the yoke.

10. A core forming machine comprising a pneumatically operated piston adapted to move vertically, a yoke on the top of said piston, a collapsible core form adapted to rest in said yoke between the arms thereof, a sand receptacle movable laterally from and to a position above said form and yoke, means on said receptacle to form a closure for the top of said form, and means carried by said receptacle to cause tight engagement of the form with one arm of the yoke when the yoke and form are elevated.

11. A core forming machine comprising a pneumatically operated piston adapted to move vertically, a yoke on the top of said piston, a collapsible core form adapted to rest in said yoke between the arms thereof, a sand receptacle movable laterally from and to a position above said form and yoke, means on said receptacle to form a closure for the top of said form, and a wedge device mounted on said receptacle to pass between one arm of the yoke and the form to clamp the form together when the yoke and form are elevated.

12. A core forming machine comprising a pneumatically operated piston adapted to move vertically, a yoke on the top of said piston, a collapsible core form adapted to rest in said yoke between the arms thereof, a sand receptacle movable laterally from and to a position above said form and yoke, means on said receptacle to form a closure for the top of said form, and a spring mounted wedge adapted to pass between one arm of the yoke and the form to clamp the form parts together as the yoke is elevated to cause the top of the form to be closed by the means on the receptacle.

In testimony whereof I hereunto affix my signature.

ROBERT N. BROWN.