June 13, 1933. L. G. KITTO 1,913,808

CORE DRAWING MACHINE

Filed Nov. 4, 1932 4 Sheets-Sheet 1

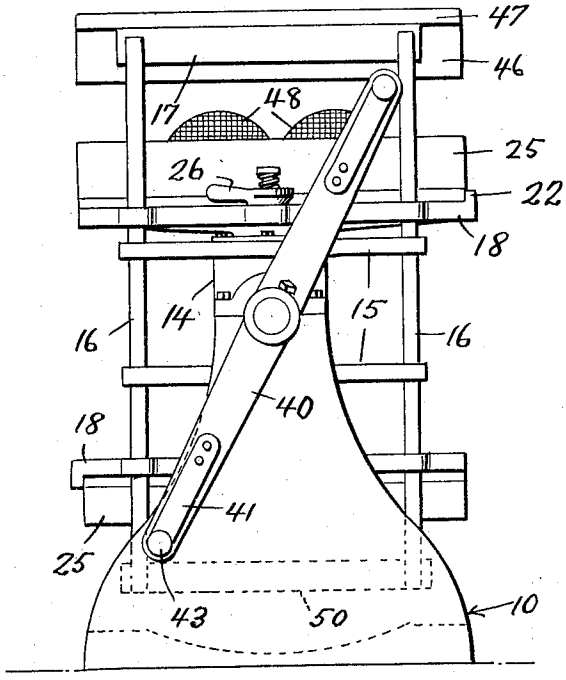


Fig. 1.

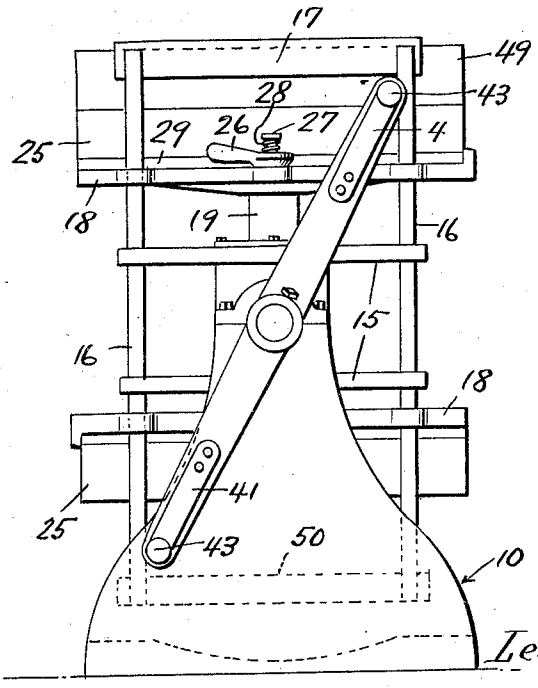


Fig. 3.

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Fig. 2.

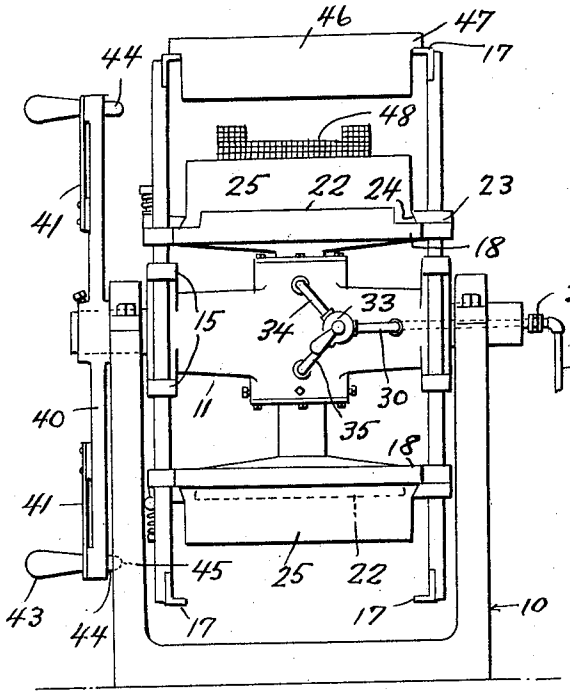
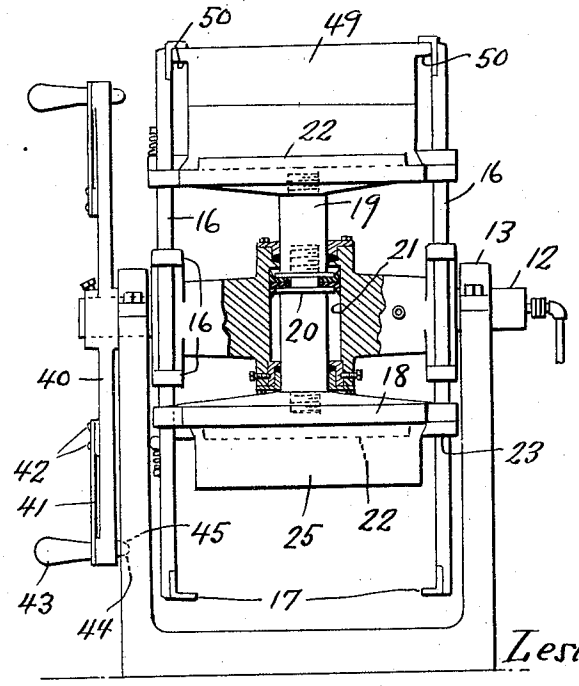


Fig. 4.



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Fig. 5.

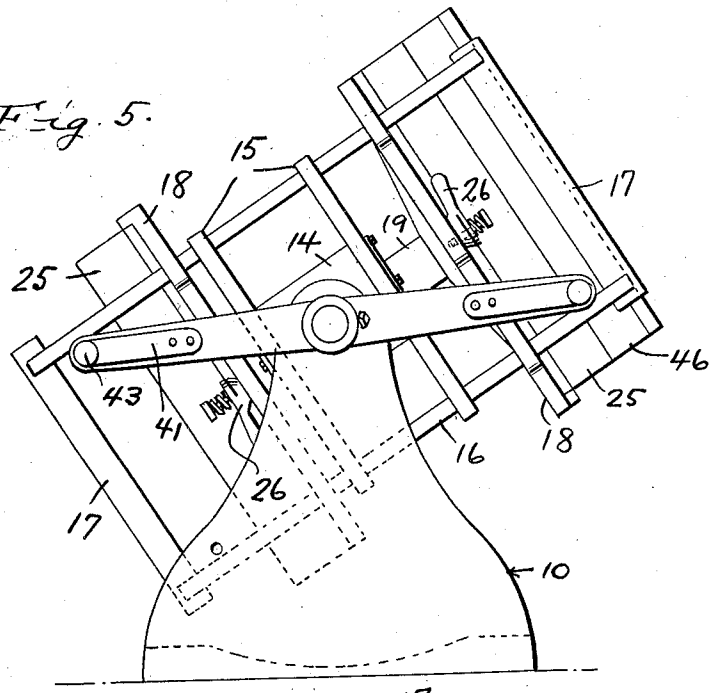
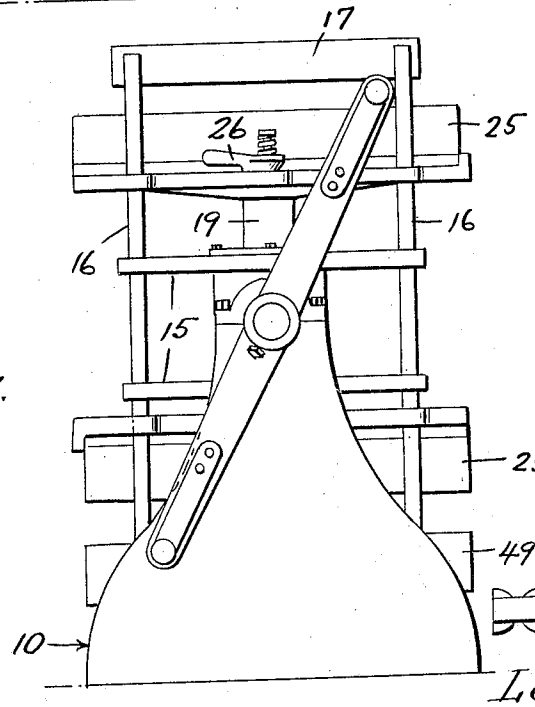


Fig. 7.



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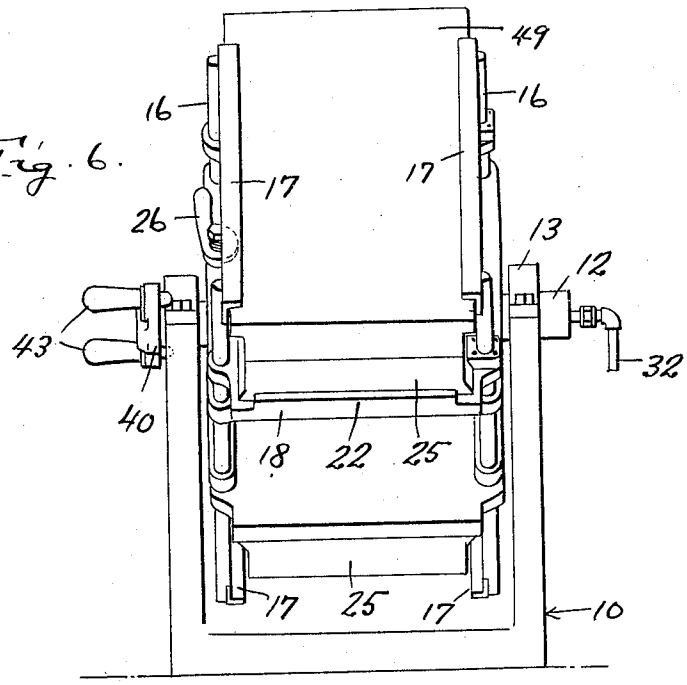
Attorney

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Fig. 6.



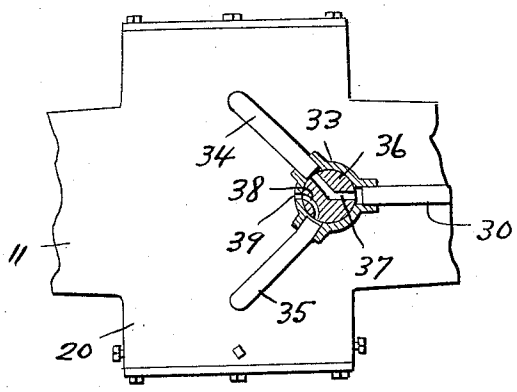


Fig. 8.

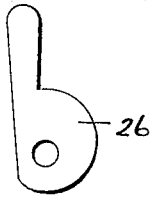


Fig. 9.

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UNITED STATES PATENT OFFICE

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CORE DRAWING MACHINE

Application filed November 4, 1932. Serial No. 641,299.

This invention is a device which may be designated as a "core drawing machine", the device being adaptable for use in connection with foundry work and will be found useful in carrying out certain operations required between the time the core boxes leave the blow machines or core makers and the finished core and dryer are placed into the baking oven.

The invention comprehends the provision of a device whereby the top and bottom core boxes, after they leave the blow machine may be so supported relative to one another as to provide for the quick removal of the core in the top core box from said box to the bottom core box; to subsequently place in position on the bottom core box the dryer, and then move the dryer and lower core box in a position to be easily placed on the conveyor of the baking oven to be carried by the conveyor into said oven.

The invention together with its numerous objects and advantages will be best understood from a study of the following description, taken in connection with the accompanying drawings wherein:

Figure 1 is a front elevational view of the machine the upper and lower core boxes being shown separated.

Figure 2 is a side elevational view of the machine, the parts being in the same position as shown in Figure 1.

Figure 3 is a view similar to Figure 1 and showing the bottom core box and the dryer clamped on the machine.

Figure 4 is a view taken at right angles to Figure 3, certain parts being broken away and shown in section.

Figure 5 is a front elevational view of the device showing the bottom core box and dryer in clamped position, and the device rotated at about forty-five degrees.

Figure 6 is a view taken at right angles to Figure 5.

Figure 7 is a front elevational view showing the device rotated one hundred and eighty degrees, the dryer and core being shown separated from the core box and in a position to be placed on the conveyor of the baking oven.

Figure 8 is a fragmentary sectional elevational view showing the position of the valve when the plate of the machine is in a raised position and

Figure 9 is a plan view of a locking cam.

Referring to the drawings in detail it will be seen that the device comprises a substantially U-shaped support 10. A hub 11 is provided with trunnions 12 journalled in bearings 13 provided at the upper ends of the sides of support 10. At the ends thereof the hub 11 is provided with squared block like portions 14 to which are secured pairs of cross arms 15. Suitably engaged with the ends of the cross arms 15 are guide rods 16 and the guide rods of each pair at the end thereof are connected by angle irons 17.

Slidably engaged with the rods 16 on relatively opposite sides of the hub 11 are plates 18. The plates 18 are suitably connected with the ends of a piston rod 19 and on an intermediate portion of the piston rod 19 is a piston 20 arranged to reciprocate within the cylinder 21 provided in an intermediate portion of the hub 11.

Each of the plates 18 is provided at one end with a transverse top flange 22. Adjacent one side edge thereof each plate 18 is provided with a flange or rib 23 that has its inner face beveled for engaging a beveled rib 24 provided on one side of a core box 25. A cam lever 26 is mounted on a vertical pivot 27 provided adjacent a relatively opposite side edge of plate 18 and is normally urged downwardly with respect to the pivot by a coil spring 28. The cam lug 26 is adapted to engage the beveled rib 29 on the proximate side of the core box 25 and to cooperate with the rib or flange 23 for securely retaining the core box 25 in position on the plate 18.

Preferably compressed air is used for reciprocating the piston 20, and the hub 11 and one of the trunnions 12 are suitably bored for receiving a conduit pipe 30. One end of the pipe 30 has a swivel connection 31 with a pipe leading from a suitable source of supply, a portion of the pipe being shown and indicated by the reference numeral 32.

The other end of the pipe is connected with one port of a conventional three way valve 33 which has a second port connected with the cylinder 21 at one end of the cylinder through the medium of a pipe 34, while a third port of the valve 33 is connected with the cylinder 21 at a relatively opposite end thereof by a pipe 35. As shown in Figure 8 the core of the valve, said core being designated by the reference character 36, is provided with an angular passage 37 for connecting the pipe 30 with the pipes 34, 35; and said core 36 is also provided with a bleeding passage 38 for connecting the pipes 34, 35 with a vent opening 39 suitably provided in the casing of the valve 33. Thus it will be seen that as the passage 37 is connecting the pipe 30 with, for example the pipe 34 for supplying air under pressure to the cylinder 21 at one side of the piston 20, the passage 38 is connecting the pipe 35 with the vent port 39 for venting the cylinder 21 at the other side of the piston 20.

Suitably secured to the other trunnion 12 is a handle 40 that is provided at each end with a leaf spring 41 secured at one end to the handle 40 as at 42 inwardly from the end of the handle. On the free end of the leaf spring 41 is a hand grip 43 together with a pin 44 the latter being adapted to engage in a socket 45 provided in one side of the support 10. It will be seen that when a pin 44 is engaged with a socket 45 the hub 11 is held against casual rotation and the cylinder 21, together with the guide rods 16 are supported in a substantially vertical or perpendicular position.

In using the device the core boxes 25, 46 are of course closed and filled with sand when they leave the blow machine or core maker. They are also arranged one upon the other, and with the device in the position shown in Figure 1 for example, the core boxes are arranged at the upper end of the machine. In this connection it is to be noted that the uppermost plate 18 will be in its raised or uppermost position and the core boxes are placed on said plate. After the core boxes are thus placed on the plate 18, the lower core box 25 is secured in position by rotating the cam 26 to engage it with the rib 29 of the core box 25 to secure the core box on the plate in a manner hereinbefore stated. It will be also noted that with the core boxes thus arranged on the uppermost plate 18, the lateral flanges 47 of the upper core box rest on the uppermost pair of angle irons 17 as shown in Figure 2. The valve 33 is then operated to position the core 36 thereof as suggested in Figure 8 for supplying air under pressure to the cylinder 21 above the piston 20 thus causing the piston 20 to move downwardly carrying with it said uppermost plate 18 which in turn carries with it the core box 25. The parts will then be in the position suggested in Figure 2, the cores 48 being in the core box 25. The core box 46 is then removed and the box like dryer 49 is then placed on top of the core box 25. The valve 33 is then manipulated to bring the passage 37 into registry with the pipes 30 and 35 for supplying air to the underside of the piston 20 for raising it. Obviously as piston 20 moves upwardly said plate 18, with core box 25 and dryer 49 thereon will likewise move upwardly until the flanges 50 provided at the top of the drier 49 are engaged with the uppermost angle irons 17 when it will be seen that the core box 25 and dryer 49 are in clamped position.

With the parts thus in the position shown in Figure 4 pin 44 at the lower end of the handle 40 is moved out of engagement with socket 45 and the handle is then rotated for rotating the hub 11 and the associated parts until the parts are in the position suggested in Figure 7.

When the parts are in the position shown in Figure 7 it will be apparent that the positions of the plates 18 are reversed. The valve 33 is then manipulated for directing the air into the cylinder against the underside of the piston 20 for causing the piston to move upwardly thus causing the plate 18 and core box 25 also to move upwardly leaving the dryer 49, with the cores therein resting on the lowermost angle irons 17 and in a position to be readily shifted from said angle irons 17 on to the conveyor of the baking furnace, a portion of the conveyor being shown in Figure 7 and designated by the reference character 51.

It will also be apparent from a study of Figure 7, that the parts are in their proper position for receiving the next set of core boxes 25, 46 so that said second set of core boxes 25, 46 may be placed in position on the top of the device even while the dryer 49 and the cores therein are being transferred from the device on to the conveyor 51.

It will thus be seen that I have provided a device for handling core boxes and dryers during the time between which the core boxes are removed from the blow machine or core makers until the cores arranged in the dryers are passed into the baking oven. It is also apparent that the device facilitates the transfer of the cores from the core boxes to the dryers and eliminates a great deal of heavy labor and reduces to a minimum the time required for transferring the cores from the blow machine to the bake oven.

Even though I have herein shown and described the preferred embodiment of the invention, it is to be understood that the same is susceptible of further changes, modifica-

tions and improvements coming within the scope of the appended claims.

Having thus described my invention, what I claim as new is:

1. In a device of the character described, a hub, supporting means for rotatably sustaining the hub, lateral guide rods on the hub, oppositely disposed angle plates secured to the outer ends of the guide rods, a plate slidably engaged with the guide rods, and means for shifting the plate toward and away from said angle irons.

2. In a device of the character described, a hub, supporting means for rotatably sustaining the hub, lateral guide rods on the hub, oppositely disposed angle plates secured to the outer end of the guide rods, a plate slidably engaged with the guide rods, and means for shifting the plate toward and away from said angle irons, said last named means including a cylinder mounted on the hub, a piston arranged to reciprocate within the cylinders, a rod connecting said piston with said plate, and means for reciprocating said piston.

3. In a device of the character described, a support, a structure rotatably mounted on the support and including opposed pairs of guide rods, a core box supporting plate slidably engaged with the guide rods, and means at one end of said guide rod for holding a core box, said means being also cooperable with said plate for clamping on the supporting structure a core box and dryer arranged in superimposed relationship.

4. In a device of the character described, a hub, lateral guide rods on the hub, plates slidably engaged with said guide rods and arranged at relatively opposite sides of the hub, a cylinder mounted in the hub, a piston arranged to reciprocate within the cylinder, a single piston rod connecting said piston with said plates, means for reciprocating the piston and box clamping elements mounted on said plates.

5. In a device of the character described, a hub, lateral guide rods on the hub, plates slidably engaged with said guide rods and arranged at relatively opposite sides of the hub, a cylinder mounted in the hub, a piston arranged to reciprocate within the cylinder, and a single piston rod connecting said piston with said plates, valve control means for supplying actuating fluid to the cylinder at opposite sides of the piston, and bars connecting said guide rods at the ends of the latter and cooperable with said plates for supporting and clamping core boxes and the like on the device.

6. In a device of the character described, a hub, a support therefor, lateral guide rods on the hub, plates slidably engaged with said guide rods and arranged at relatively opposite sides of the hub, a cylinder mounted in the hub, a piston arranged to reciprocate within the cylinder, and a single piston rod connecting said piston with said plates, valve control means for supplying actuating fluid to the cylinder at opposite sides of the piston, and bars connecting said guide rods at the ends of the latter and cooperable with said plates for supporting and clamping core boxes and the like on the device, a handle on one end of said hub, and inter-engaging means on said handle and support for retaining the hub against casual rotation.

In testimony whereof I affix my signature.

LESLIE G. KITTO.