Aug. 13, 1929. W. E. NEWNAM 1,724,304

PIG LEAD STACKING MACHINE

Original Filed July 30, 1923

Fig. 3.

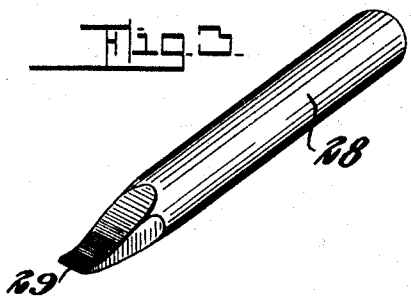



Fig. 2.

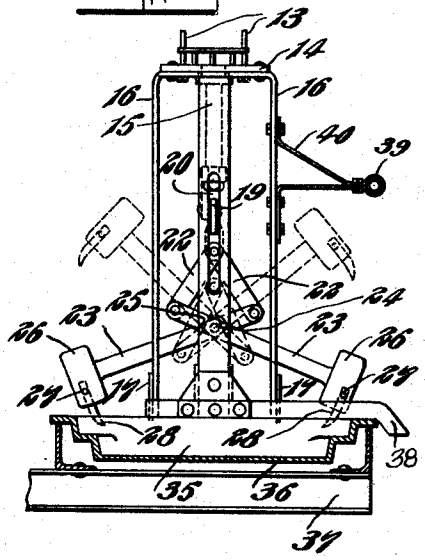
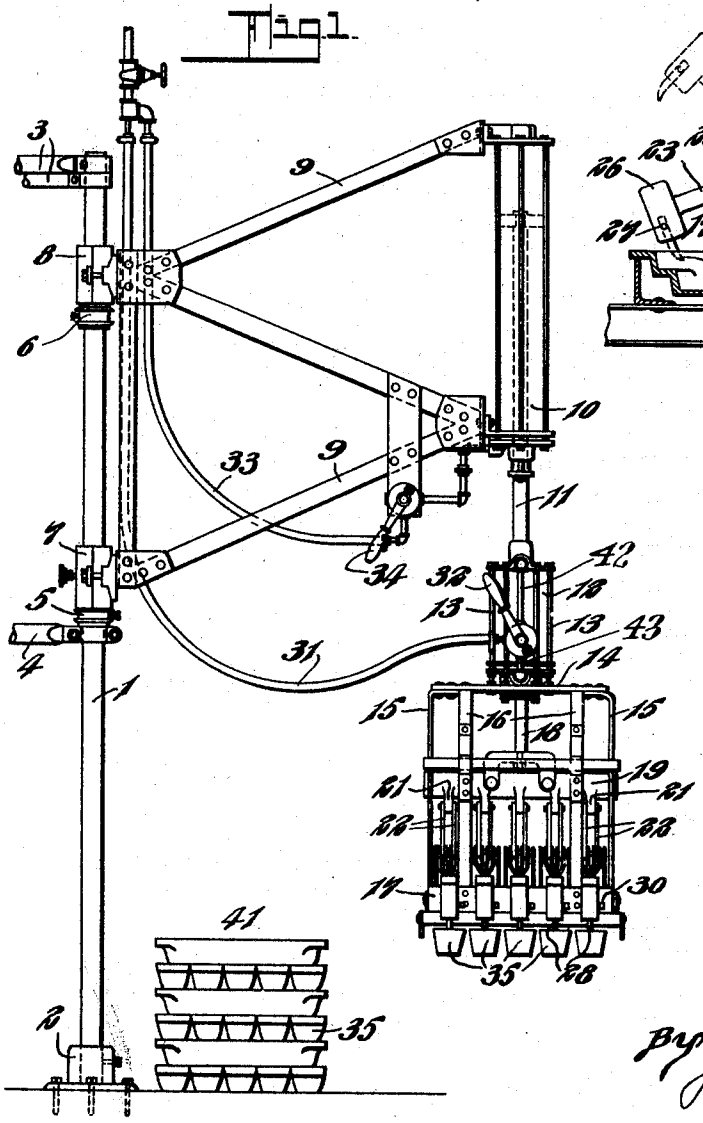



Fig. 1.




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# UNITED STATES PATENT OFFICE.

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## PIG-LEAD-STACKING MACHINE.

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This invention relates to stacking machines, and more particularly to machines for stacking pig lead and similar articles.

In the manufacture of pig lead, it is customary to run the molten lead into molds to form the same into so-called pigs. The molded pigs may thereafter be removed from the molds and deposited in some convenient place for storage. As the pigs are quite heavy, it is an expensive operation to remove them from the molds and stack them by hand. Furthermore the pig molding is often done by mechanism in which the molds are arranged in gangs so that it is convenient to provide for handling the pigs in gangs by mechanism which will remove them from the molds and stack them for storage.

One of the objects of this invention, therefore, is to provide a machine which may be used to remove a casting of pigs from the molds and deposit the same for storage.

Another object of this invention is to provide such a machine which is convenient to handle and certain in its operation.

Further objects will appear from the detail description taken in connection with the accompanying drawing, in which:

Figure 1 is a view in elevation showing a pig stacking machine embodying this invention;

Figure 2 is an enlarged end view of the grasping mechanism; and

Figure 3 is a perspective view of one of the claws.

Referring to the accompanying drawing, 1 designates an up-right or standard which may be mounted in a suitable floor socket 2 and supported by braces 3 and 4 secured to the wall or other convenient support. A pair of collars 5 and 6 fixed to the standard 1 is adapted to support a pair of swivel connections 7 and 8 mounted to turn on the standard 1 and supporting a bracket or frame 9. The frame 9 carries at its outer end a pneumatic lifting cylinder 10. The cylinder 10 thus mounted is adapted to swing about the standard 1 so as to be capable of being positioned for lifting the pigs from the molds and thereafter being moved to a position for placing the pigs in a suitable stack.

The piston rod 11 of the lifting cylinder 10 carries at its lower end an auxiliary air cylinder 12. Suspended by bolts 13 from the cylinder 12 is a carrier comprising a top plate 14, end plates 15 and side plates 16 connected at their lower ends to a frame 17. The plate 14 is suspended with its middle part directly below the cylinder 12 so that the carrier as a whole hangs directly below that cylinder. The piston rod 18 which is connected to a piston in the cylinder 12 is connected at its lower end to a cross-head 19 adapted to move vertically in guide slots 20 in the end plates 15. The upward and downward movement of the piston rod 18 will, therefore, cause a corresponding movement of the cross-head 19 in the guide slots 20.

The cross-head 19 has formed thereon or attached thereto a series of ears 21 extending downwardly therefrom. Each one of the ears 21 has pivoted thereto a pair of links 22, each jointed at its other end to one of a pair of levers 23. The levers 23 of each pair cross a short distance from the ends to which the links 22 are connected, and each lever pair is pivoted on a pair of upright standards 25 mounted on the frame 17. The pivot bolt 24 passes through both levers 23 of a pair as well as the standards 25, so that the levers 23 are pivoted to each other at this point as well as to the standard. Each lever 23 is weighted at the outer end of its long arm with a weight 26 formed integral with or attached to the lever. The weighted arm of each lever is provided with a socket 27 adapted to receive a pick or claw 28 provided with a sharpened point 29 and fixed in the socket 27 by means of a set-screw 30 or other suitable means. The claw 28 has its sharpened end 29 bent to an arc such that when the claw is mounted in its socket, such arc will have a center substantially at the pivot 24.

As may be seen from Figure 2 downward movement of the cross-head 19 will cause the links 22 to move the short arms of the levers 23 downwardly so as to raise the long weight-

ed arms thereof, as indicated in dotted lines in this figure. Correspondingly an upward movement of the cross-head 19 will permit the weighted ends of the levers to be dropped to the full line position of Figure 2. Movement of the cross-head 19 is effected by the piston in the cylinder 12, this cylinder being connected to a suitable compressed air supply by a connection 31 and a manipulative control valve 32 is arranged to connect 31 with either of branches 50 and 51 leading to the top and bottom of the cylinder respectively. The valve 32 is operated to move the piston of the cylinder 12 in either direction so as to either raise or lower the cross-head as desired.

The cylinder 10 is similarly provided with an air connection 33 and a control valve 34.

The operation of this device is as follows: The pigs 35 are cast in suitable pig molds 36 which may be mounted in gangs on the wheel or frame 37 of a suitable molding machine. The standard 1 is located so that the cylinder 10 and the carrier may be positioned over the pig molds 36 when they arrive at a suitable point in their travel, and with pairs of claws over and at the ends of the pigs as shown. When the cylinder has been so positioned, the valve 34 is operated to lower the carrier down onto the pig molds. During this operation the levers 23 are held with their weighted ends in the raised or dotted line position of Figure 2, this being accomplished by admission of air to the top of the cylinder 12. The frame 17 may be provided with suitable guide arms 38 for positioning the carrier with respect to the molds as indicated in Figure 2. A suitable handle 39 mounted on brackets 40 on the side plates 16 may also be provided for manipulating the carrier.

When the carrier has been placed upon the molds and suitably positioned thereon with each pair of claws above a pig, the valve 32 is operated to admit air to the bottom of the cylinder 12 so as to quickly raise the cross-head 19 in order to drop the weighted long arms of levers 23. The falling weights 26 will then cause the claws 28 to strike into and penetrate the upper surface of the pigs, each being penetrated by a pair of claws. As energy has been stored in the raised weights 26, as the lever arms 23 are long and as these weights accumulate considerable kinetic energy when falling, the impact will have the effect of thrusting or driving the claws into the pigs. This action of the falling weights is of course supplemented by the air pressure in the bottom of the cylinder 12 and acting on the piston therein. Upon completion of such movement the air pressure is retained in the cylinder 12 so as to keep a tension on the rod 18, thereby holding the levers 23 in their lowered position and maintaining the grasp of the claws 28 upon the pigs. It will be noted that the claws are not only curved inwardly but that they move inwardly in arcs from the ends towards the middle of a pig; accordingly the pig will be grasped by these claws so that the former can be lifted out of its mold by raising the cylinder 13 and its attached carrier, while the claws mounted on and raised with the carrier maintained their firm grasp on the pigs.

The valve 34 may now be operated to admit air under the piston in the cylinder 10 so as to raise the rod 11 and lift the carrier. As the carrier is lifted, each pair of arms 23 retains a pig impaled upon the stakes or claws 28 and the pigs are lifted out of the molds as the carrier rises. The carrier with a gang of pigs in its grasp is now swung on the standard 1 to a position where the pigs may be deposited on a suitable stack 41. Upon arriving over the stack the valve 34 is operated to release the air from the cylinder 10 in order to permit the carrier to drop and deposit the pigs upon the stack. Thereupon the valve 32 is operated to admit air to the top of the cylinder 12 in order to lower the rod 18, thereby raising the arms 23 carrying the claws and releasing the pigs. The pointed claws are short and stubby and are, accordingly, of sufficient stability to penetrate the pig, and these claws are mounted on the carrier so as to drop on and move by impact into the pig in order to attach the same to the carrier while this carrier is sustained closely above the top face of the pig.

It will be clear, therefore, that this invention provides a convenient and effective machine for stacking pigs. The carrier is arranged for manipulation to be placed over the pigs in the molds and is adapted to be positioned on the molds. The claws or stakes are then dropped so as to strike into the pigs to grasp the same, and the mechanism operates to maintain the grasp while the pigs are being lifted from the molds. The pigs are then deposited on the stack and the grasp thereon released. The mechanism is such that the entire device can be handled by a single operator and various movements performed properly and with great accuracy, so that a large quantity of work can be handled in a short time. The construction is such that all parts subject to wear are readily renewable.

It is obvious that various changes may be made in details of construction within the scope of the appended claims without departing from the spirit of this invention; it is, therefore, to be understood that this invention is not to be limited to the specific details shown and described.

Having thus described the invention, what is claimed is:

1. A device for handling pigs, comprising, a carrier, a pointed weighted claw thereon

adapted to work into the pig, and means for thrusting said claw into the pig in order to attach the same to said carrier.

2. A device for handling pigs, comprising, a carrier, a pointed claw adapted to penetrate the pig, means for mounting said claw on said carrier for movement towards the pig, and operating means connected with and for driving said claw by impact into the pig in order to attach the same to said carrier.

3. A device for handling pigs, comprising, a carrier, a pointed claw adapted to penetrate the pig, means for mounting said claw on said carrier for movement towards the pig, and operating means including a weight connected with and adapted to drive said claw into the pig in order to attach the same to said carrier.

4. A device for handling pigs, comprising, a carrier, a weighted claw adapted to penetrate the pig, means for raising said claw, means for mounting said claw on said carrier for movement towards and from the pig, and means for causing said claw to drop upon the pig in order to attach the pig to said carrier.

5. A device for handling pigs, comprising, a carrier, a weighted claw on said carrier, means for swinging said claw to strike into and grasp the pig, and means for maintaining the grasp.

6. A device for handling soft metal pigs, comprising, a carrier, a pointed claw of sufficient stability to penetrate the pig, means for mounting said claw on said carrier so as to cause said claw to drop on and move by impact into the pig in order to attach the same to said carrier and means for withdrawing said claw from the pig.

7. A device for handling soft metal pigs, comprising, a carrier, a pair of pointed claws of sufficient stability to penetrate the pig, means for mounting said claws on said carrier so as to cause said claws to drop on and move by impact into the ends of the pig in order to attach the same to said carrier and means for withdrawing said claws from the pig.

8. A device for handling soft metal pigs, comprising, a carrier, a pair of pointed claws of sufficient stability to penetrate the pig, means for mounting said claws on said carrier so as to cause said claws to drop on and move by impact into the ends of the pig towards the middle in order to attach the same to said carrier and means for withdrawing said claws from the pig.

9. A device for handling soft metal pigs, comprising, a carrier having a foot adapted to rest on the pig, a pointed claw of sufficient stability to penetrate the pig, means for mounting said claw on said carrier to cause said claw to drop on and move by impact into the pig in order to attach the same to said carrier and means for withdrawing said claw from the pig.

10. A device for handling soft metal pigs, comprising, a carrier having a foot adapted to rest on the pig, a pair of pointed claws of sufficient stability to penetrate the pig, means for mounting said claws on said carrier so as to cause said claws to drop on and move by impact into the ends of the pig in order to attach the same to said carrier and means for withdrawing said claws from the pig.

11. A device for handling soft metal pigs, comprising, a carrier having a foot adapted to rest on the pig, a pair of pointed claws, means for mounting said claws on said carrier so as to cause said claws to drop on the top face of the pig at the ends thereof, said claws being short and stubby in order to penetrate the pig so as to attach the same to said carrier and means for withdrawing said claws from the pig.

12. A device for handling soft metal pigs, comprising, a carrier, a pair of pointed claws, means for mounting said claws on said carrier so as to cause said claws to drop on the top face of the pig at the ends thereof while said carrier is sustained closely thereabove, said claws being short and stubby in order to penetrate the pig so as to attach the same to said carrier and means for withdrawing said claws from the pig.

13. A device for handling soft metal pigs, comprising, a carrier, a pointed claw of sufficient stability to penetrate the pig, means on said carrier for mounting said claw so as to drop on and move by impact into the pig in order to attach the same to said carrier, means for moving said claw towards the pig, and means for withdrawing said claw from the pig.

14. A device for handling soft metal pigs, comprising, a carrier, a pointed claw of sufficient stability to penetrate the pig, means on said carrier for mounting said claw so as to drop on and move by impact into the pig in order to attach the same to said carrier, means for holding said claw raised above the pig, and means for permitting said claw to drop on and for moving said claw into the pig.

15. A device for handling soft metal pigs, comprising, a carrier, a pointed claw of sufficient stability to penetrate the pig, means on said carrier for mounting said claw so as to drop on and move by impact into the pig in order to attach the same to said carrier, fluid pressure means for raising said claw, and means for permitting said raised claw to drop.

16. A device for handling soft metal pigs, comprising, a carrier, a pointed claw of sufficient stability to penetrate the pig, means on said carrier for mounting said claw so as to drop on and move by impact into the pig

in order to attach the same to said carrier, and means for raising said claw and for permitting the same to drop.

17. A device for handling soft metal pigs, comprising, a carrier, a pointed claw of sufficient stability to penetrate the pig, means on said carrier for mounting said claw so as to drop on and move by impact into the pig in order to attach the same to said carrier, and fluid pressure means for moving said claw to move towards and from the pig.

In testimony whereof I affix my signature this 22nd day of June, 1923.

WILLIAM E. NEWNAM.