March 16, 1937. T. A. SCHRAISHUHN 2,074,312

HEAT TREATING APPARATUS

Filed Jan. 16, 1937 2 Sheets-Sheet 1

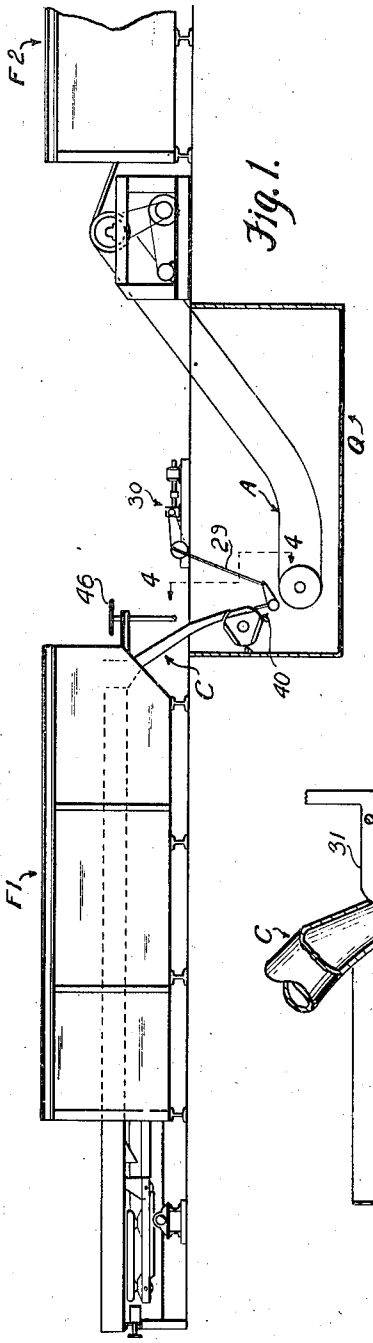


Fig. 1.

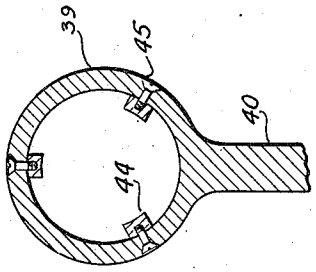


Fig. 3.

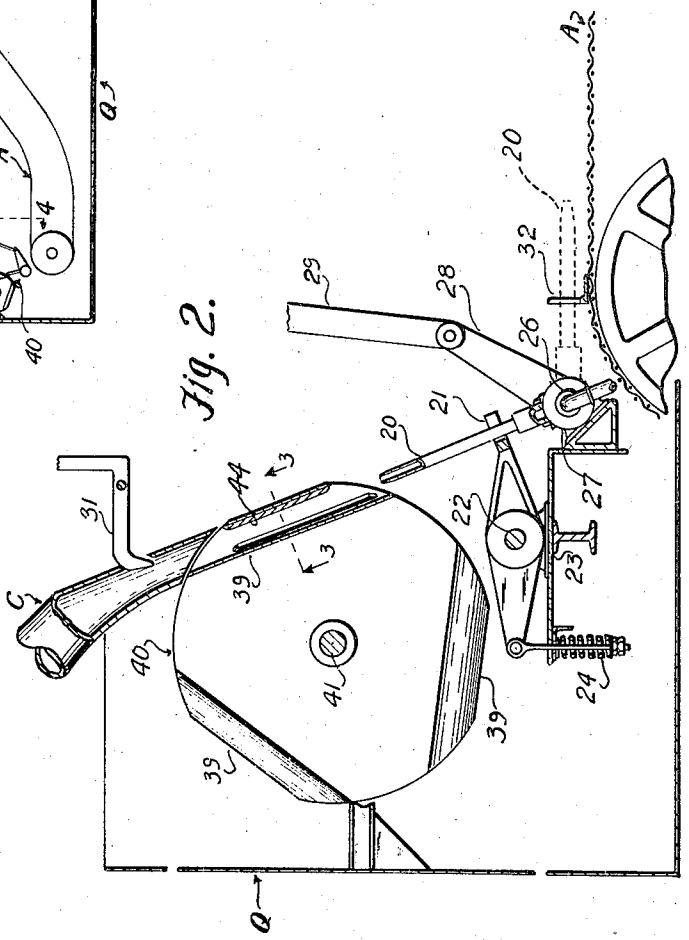


Fig. 2.

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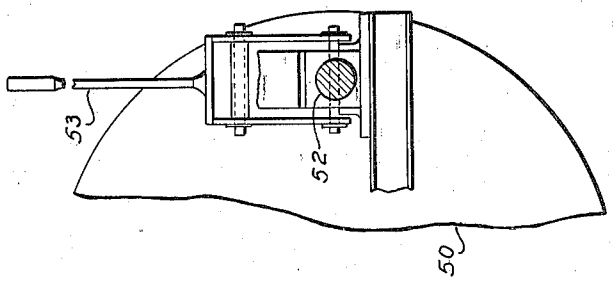


Fig. 5.

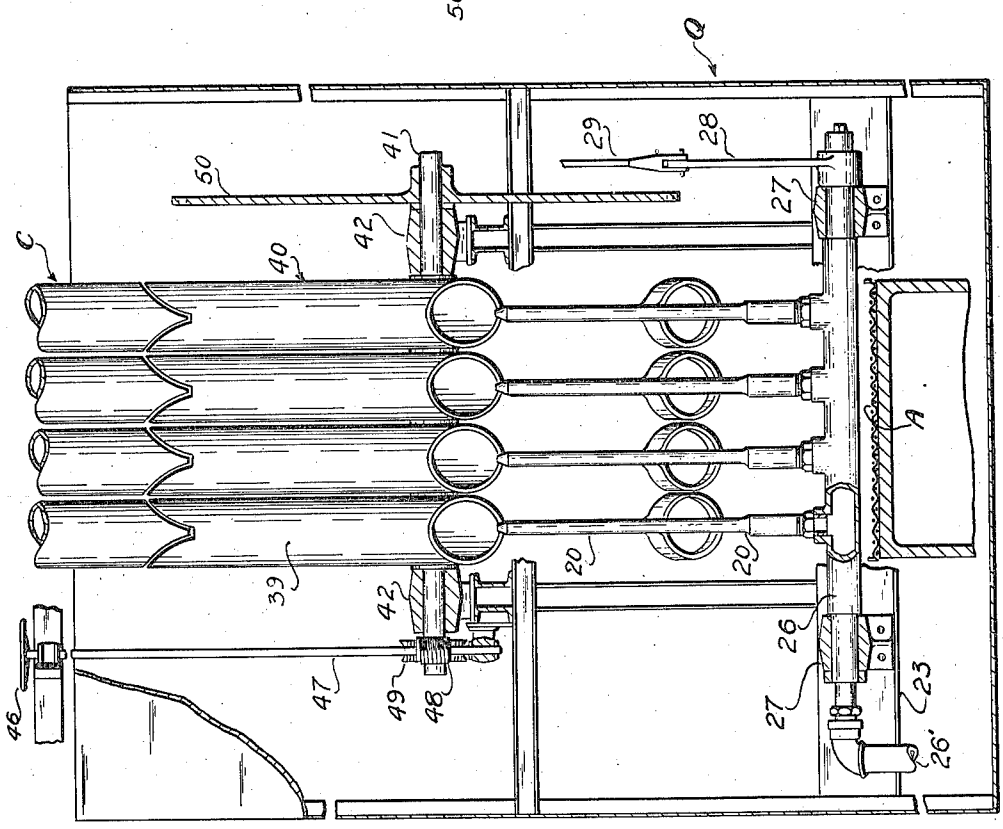


Fig. 4.

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UNITED STATES PATENT OFFICE

2,074,312

HEAT TREATING APPARATUS

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Application January 16, 1937, Serial No. 120,923

3 Claims. (Cl. 266—4)

This invention relates to improvements in mechanism for guiding ordnance shells and the like from a heat-treating furnace to a quench tank having therein an upwardly pointing finger on which the shells are received one at a time and which serves, among other things, to transfer the shells to a conveyor leading out of the tank.

The object or objects sought to be accomplished will more fully appear hereinafter.

In the accompanying drawings wherein the preferred form of the invention is shown,—

Fig. 1 is a more or less diagrammatic layout of the environment wherein the present invention has special utility;

Fig. 2 is an enlarged fragmentary view showing in greater detail the combinational features of the present invention;

Fig. 3 is an enlarged sectional view on line 3—3 of Fig. 2;

Fig. 4 is a front elevation (with parts in section) of the apparatus shown in Fig. 2, and

Fig. 5 is a fragmentary view of a detail.

Referring to Fig. 1, F1 indicates a conveyor-type heat-treating furnace, Q a quench tank and F2 a second heat-treating furnace. The shells or objects to be heat-treated are passed first through the furnace F1, then into the quench tank and finally through the furnace F2. The conveyor which forms part of the furnace F1 is preferably, though not necessarily, of the type shown in patent to Cone No. 2,057,367, dated October 13, 1936, the same being adapted to convey a plural number of rows of shells through the furnace. The furnace F2 may be of the same type as the other furnace.

Regardless of the type of conveyor associated with the furnace F1, the shells will be passed through the furnace open end first, in a row, and then be discharged one at a time and open end first into a chute C leading into the quench tank Q. There will be one chute for each row of shells and below each chute is a finger 20 which normally points upwardly at an angle in axial alinement with the discharge end of the chute for receiving a downcoming shell. The finger thereupon swings toward the right as viewed in Fig. 2, to the dotted line position, for the purpose of depositing its shell on an endless belt conveyor A leading out of the quench tank to the furnace F2. Below each chute is a bumper for arresting the downward movement of the shells, the same being shown as a lever 21 turnably mounted on a shaft 22 carried by a support 23 and coupled at one end to a shock absorber shown as a coil spring 24.

The various fingers 20 are shown as secured to a common shaft 26 turnably supported in bearings 27. The fingers and the shaft are tubular and the latter is coupled to a feed pipe 26' leading from a pump (not shown) for supplying quenching liquid under pressure. It will, therefore, be seen that the fingers 20 also serve as nozzles for discharging quenching liquid into the shells as they come down their respective chutes. When all of the fingers 20 are mounted on a common shaft 26 it will, of course, be understood that the shells leaving the furnace F1 will enter their respective chutes at one and the same time.

The shaft 26 is turned back and forth the proper degree by any preferred mechanism which is shown as comprising a crank arm 28 affixed to one end of the shaft and a link 29 which couples the arm to a power operated device 30 (see Fig. 1). The operation of the device 30 is controlled by any preferred means which for illustrative purposes may be considered as a trip 31 extending into one of the chutes C, the trip being actuated by a shell coming down the chute. Upstanding lugs 32 on the endless belt A remove the shells from the fingers 20 when the latter are in the dotted line position shown in Fig. 2.

In apparatus of the kind described, it is essential that the discharge end of the shell chute shall always be of the proper diameter to insure that the shells coming down the chute shall be properly guided onto the upstanding finger below the chute. Different size shells will, therefore, require different size chutes. Heretofore it has been a time consuming operation to replace a chute of one size with a new one of a different size and such operation has usually involved draining of the quench tank which ordinarily will contain about 10,000 gallons of oil. It is with the object in view of reducing to a minimum the time and trouble involved in changing the size of the chute that the present invention has been made and the way in which that object is accomplished will now be described.

In accordance with the present invention, the lower part of the chute C consists of one of a number of tubular sections 39 at the rim of a wheel 40 carried by a shaft 41 supported in bearings 42 within the quench tank Q. The only difference between the sections is that their diameters are different. Consequently in order to make the heat-treating apparatus ready to handle one of a number of shell sizes it is merely necessary to turn the wheel 40 to bring the proper size chute section 39 into position with respect to the upper chute section. As shown in Fig. 3,

the chute sections 39 are interiorly provided with detachable guiding ribs 44 held in place by screws 45.

As shown in Fig. 4 there will be as many wheels 48 as there are chutes C. Turning of the wheels may be effected in any preferred way as by turning a wheel handle 46 affixed to the top of a turn rod 47 having a worm 48 in mesh with a worm wheel 49 affixed to the wheel shaft 41 all as clearly shown in Fig. 4. In order to lock the wheels in fixed position there may be affixed to one end of the wheel shaft 41 a disk 50 having appropriately located holes for the reception of a locking pin 52 operable from outside of the quench tank Q by hand operated means 53.

What I claim is:

1. The combination with a quench tank and a furnace arranged and adapted to feed tubular objects to said tank and a finger in said tank which normally points upwardly for receiving said objects thereon but which is supported for arcuate movement in a vertical plane whereby the objects received on the finger may be removed therefrom at a point angularly removed from the point of reception on the finger, of means for transferring objects from the furnace onto said finger when the latter points upwardly, said means comprising a chute, the lower portion of which comprises one of a number of tunnels carried by a turnable member arranged in said tank, and means for turning said member to bring a selected one of said tunnels into position to serve as the lower portion of the chute.

2. The combination with a quench tank and a finger therein which normally points upwardly and which is adapted to receive tubular objects thereon but which is supported for arcuate movement in a vertical plane whereby the objects received on the finger may be removed therefrom at a point angularly removed from the point of reception on the finger, of means for conducting said objects onto said finger when it is upright, said means comprising a turnable member which carries a plurality of tunnels of different diameters, and means for turning said member to bring any one of said tunnels into axial alinement with the finger in its upright position.

3. The combination with a quench tank and a furnace arranged and adapted to feed tubular objects to said tank and a finger in said tank which normally points upwardly for receiving said objects thereon but which is supported for arcuate movement in a vertical plane whereby the objects received on the finger may be removed therefrom at a point angularly removed from the point of reception on the finger, of means for transferring objects from the furnace onto said finger when the latter points upwardly, said means comprising a chute, the lower portion of which comprises one of a number of tunnels carried by a turnable member arranged in said tank.

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