May 17, 1955 H. E. OHL 2,708,305

TOOL ASSEMBLING APPARATUS

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Fig. 1

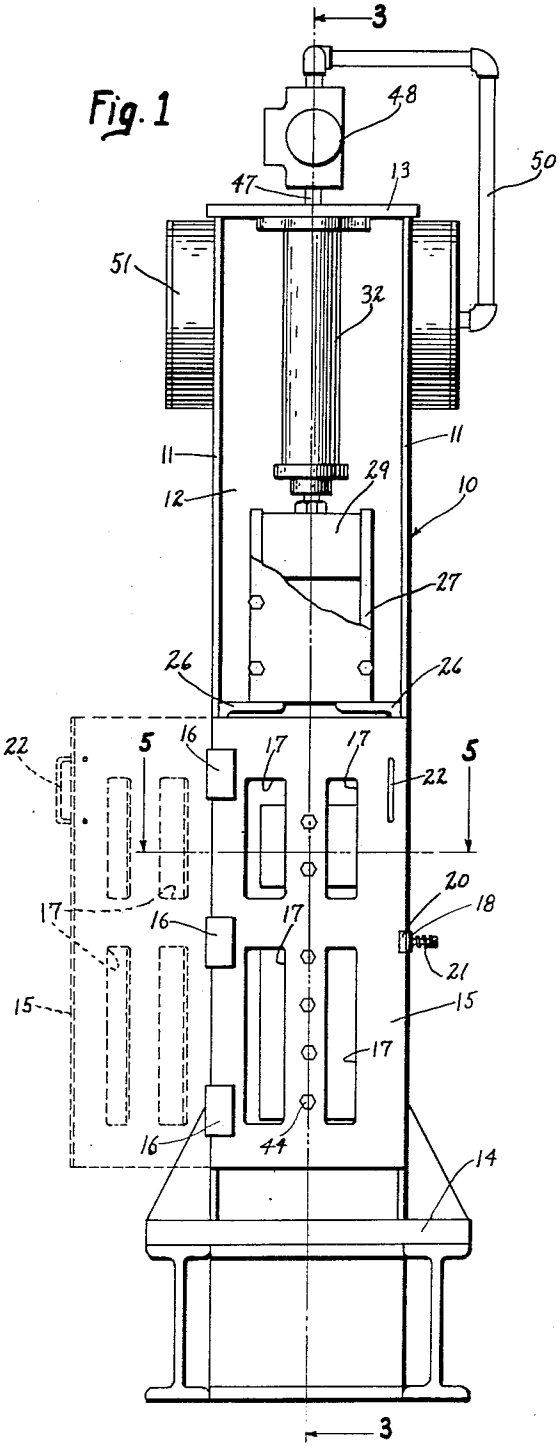
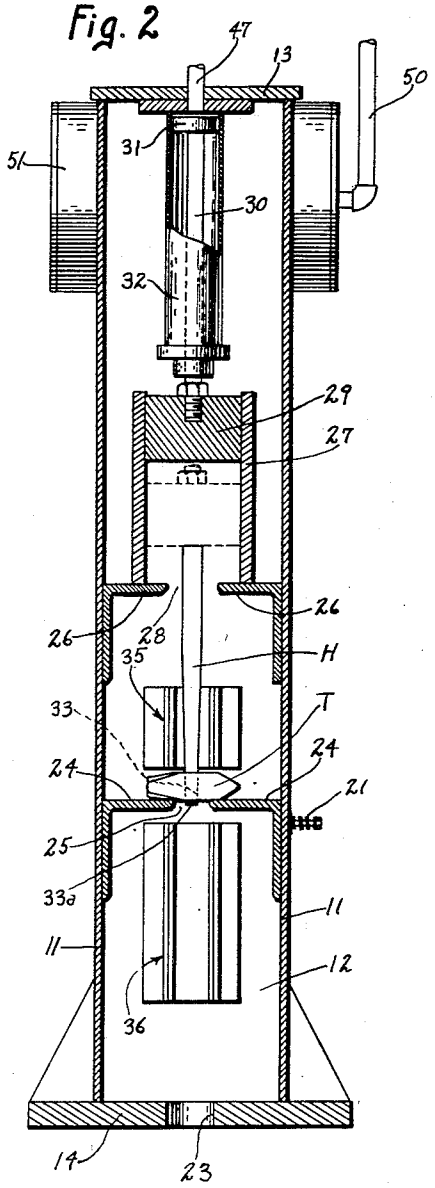


Fig. 2



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Fig. 3

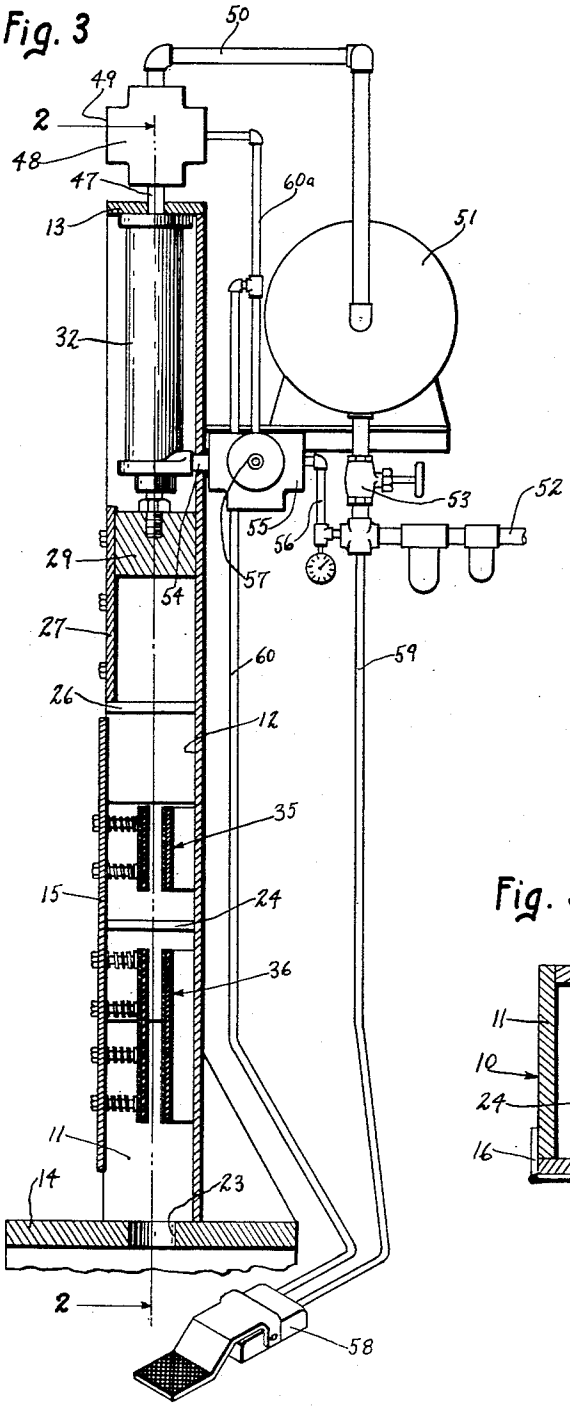


Fig. 4

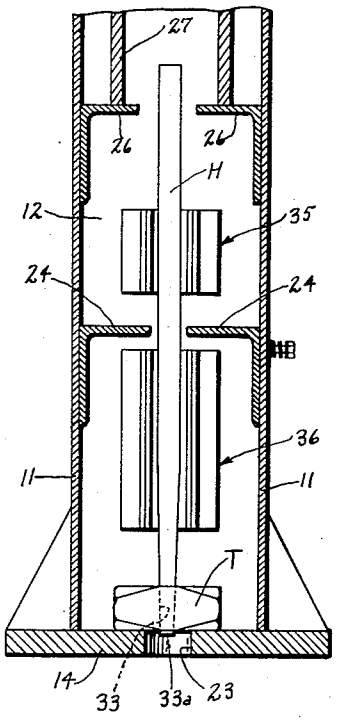
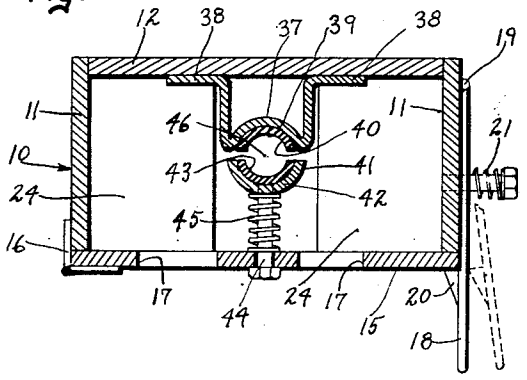


Fig. 5



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TOOL ASSEMBLING APPARATUS

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Application April 29, 1950, Serial No. 159,044

1 Claim. (Cl. 29—242)

My invention relates to tool assembling apparatus, and more particularly to apparatus for assembling handles with tool heads, and the principal object of my invention is to provide new and improved apparatus of this character.

Heretofore, it has been cutomary to assemble a handle with a tool head, such as a hammer or sledge head, by driving the handle to assembled relation with a head through repeated blows of a hammer manipulated by hand. This has been unsatisfactory because of the time involved and because the handle end was frequentiy chipped by the repeated hammer blows.

My invention provides apparatus that will assemble a handle with a tool head in economical manner and that will eliminate spoilage caused by chipping of the handle.

In the drawings accompanying this specification, and forming a part of this application, there is shown, for purposes of illustration, an embodiment which my invention may assume, and in these drawings:

Figure 1 is a front elevation of an apparatus illustrating an embodiment of my invention, parts being shown in dotted lines to indicate another position thereof,

Figure 2 is a fragmentary, longitudinal sectional view corresponding generally to the line 2—2 of Figure 3,

Figure 3 is a fragmentary, longitudinal sectional view corresponding generally to the line 3—3 of Figure 1, certain parts being shown in elevation,

Figure 4 is a fragmentary, longitudinal sectional view similar to Figure 2, but showing the apparatus in use for assembling a longer handle, and

Figure 5 is an enlarged, transverse sectional view corresponding generally to the line 5—5 of Figure 1.

Referring to the drawings, the embodiment herein shown to disclose the invention comprises an upright casing **10** having side walls **11**, a rear wall **12**, top wall **13** and a bottom wall **14**, and such walls may be welded or otherwise suitably secured together.

A door **15** is provided for closing a lower portion of the casing **10**, the door being swingably mounted on the casing, as by means of hinges **16**. The door **15** is preferably formed with openings **17** to provide for view of the adjacent inner portion of the casing when the door is closed.

Latch means are provided for selectively holding the door in closed position and, as best seen in Figure 5, the latch means comprises an arm **18** pivoted to a side wall **11**, as at **19**, and provided with a lateral extension **20** forming a shoulder for abutting the door. The arm **18** is urged toward the side wall **11** by means of a spring **21** which encircles the shank of a bolt and is interposed between the bolt head and the side wall **11**. The shank of the bolt passes through an aperture in the arm and has its extremity screw threaded into the side wall. Thus, when the arm is moved to position shown in dotted lines in Figure 5, the abutment will be clear of the door and the door may be opened, as for example by pulling on the hand pull **22**.

As seen in the several figures, the bottom wall **14** is

preferably of greater thickness than the side walls **11**, and is adapted to form a support for a tool head T (see especially Figure 4). The bottom wall **14** is formed with an aperture **23** to provide for clearance during assembly operations.

Spaced upwardly from the bottom wall **14** is a pair of inwardly turned angles **24** which form a support for a tool head T (see Figure 2). The angles stop short of engagement to provide a space **25** for clearance during assembly operations.

Spaced upwardly from the angles **24** is another pair of angles **26** which form a support for a slide-guiding housing **27**. The angles stop short of engagement to provide a space **28** for clearance of the upper end of a handle H, as seen in Figures 2 and 4. A slide head **29** is mounted for reciprocable movement within the housing **27** and is connected to a piston rod **30** extending from a piston **31** which works in a cylinder **32**. The cylinder **32** is connected to the top wall **13** in any suitable manner.

The apparatus herein disclosed is adapted to assemble tool heads with handles of various lengths. As seen in Figure 2, a tool head T is supported on the angles **24** with the opening **33** through the head in alignment with the space **25** between the angles. A relatively short handle H is aligned with the opening **33** in the tool head T and the slide head **29** is moved downward to force the lower end of the handle H into proper assembled relation within the opening **33** in the tool head T. Usually the lower end of the handle H is forced beyond the under surface of the tool head T, as seen at **33***a* in Figures 2 and 4, and this extension is preferably trimmed prior to the time the usual retaining wedge is driven into this end of the handle.

In Figure 4 the tool head T is supported on the bottom wall **14** and a longer handle H extends upwardly through the space **25** between the angles **24** and through the space **28** between the angles **26**, the upper end of the handle being in position for engagement with the slide head **29**.

Means are provided for holding a handle H in proper relation for assembly with a tool head supported on either the bottom wall **14** or the angles **24**. As herein disclosed, such means preferably include resiliently mounted portions to urge the handle to proper relationship and for purposes of disclosure, clamp means in part carried by the casing **10** and in part carried by the door **15** are herein shown.

The clamp means are preferably formed in two sections **35** and **36**, the lower sections being here shown as of greater longitudinal extent than the upper section **35**. Each section comprises a clamp portion **37** having legs **38** which are welded or otherwise suitably secured to the rear wall **12** of the casing **10**. The portion **37** is formed with a transversely curved center part **39** and to this center part is secured a strip of flexible material **40** in such manner that the strip will generally follow the curvature of the center part **39**. The strip **40** may be formed of any suitable material such as rubber, fabric or a combination thereof, and the strip may be riveted to the center part or otherwise suitably secured.

Each section **35** and **36** also comprises a clamp portion **41** adapted for cooperation with clamp portions **37**. As herein shown, the clamp portion comprises an elongated transversely curved part **42** having a flexible strip **43** secured thereto. The clamp portions **41** are resiliently carried by the door **15**, and in the embodiment herein disclosed the portions are carried by the door by means of bolts **44** which loosely extend through respective apertures in the door, each bolt having its head abutting the exterior surface of the door and having its shank extremity threaded into a curved part **42**. A coil spring **45** encircles each bolt and is interposed between the curved part **42** and the adjacent inner surface of the door **15**.

Thus, when the door is closed, the clamp portions 41 are normally urged to cooperating relationship with the clamp portions 37 to form an opening 46 (see Figure 5) for receiving a handle H. In use, and with the door open, an operator may dispose a tool head T on either the bottom wall 14 or the angles 24, depending upon the length of the handle to be inserted. The operator then disposes a handle against the clamp portions 37 and closes the door 15 so as to bring the clamp portions 41 into cooperating relationship with the clamp portions 37. It will be appreciated that in the event of misalignment of the handle H, the resiliently mounted clamp portions 41 will engage the handle and urge it to proper alignment with the tool head. The slide head 29 is then brought down to force the lower end of the handle into the tool head opening. The clamp portions 41 not only serve to properly align the handle H, but also provide sufficient flexibility so that the handle may be moved longitudinally and yet be properly clamped for alignment with the tool head.

In the embodiment herein disclosed the piston 31 in the cylinder 32 is operated by means of air under pressure. Referring particularly to Figure 3, the upper end of the cylinder 32 is connected, by means of a conduit 47, to a pilot-operated valve 48 which may be of any conventional design and is constructed to normally establish air flow between conduit 47 and an exhaust port 49. The valve 48 may be moved from its normal position to a position wherein the conduit 47 is connected to a conduit 50 which leads from a pressure tank 51. The pressure tank 51 is connected to a pressure source (not shown) by means of a conduit 52, a flow control valve 53 being preferably interposed in the conduit 52.

The lower end of the cylinder 32 is connected, by means of a conduit 54, to a pilot-operated valve 55 which may be of any conventional design and is constructed to normally connect the conduit 54 to a conduit 56 communicating with the pressure-source line 52. The valve 55 may be moved from normal position to a position wherein the conduit 54 is connected to an exhaust port 57.

A foot control valve 58 is provided for effecting operation of the pilots of valves 48 and 55, and as herein shown the foot valve 58 controls flow of air between conduits 59 and 60. The conduit 59 is connected to the pressure-source line 52 and the conduit 60 is connected to the pilot portion of the valve 55 and has a branch 60*a* connected to the pilot portion of the valve 48.

In operation, assuming that an operator has properly placed a tool head T and handle H in the apparatus, foot pressure on the foot control valve 58 will cause air under pressure to flow from conduit 59 to conduit 60. Air pressure in conduit 60 will effect operation of the pilot portions of the valves 55 and 48 and move the valves from their normal position. With the foot valve 58 depressed, air under pressure will flow from the pressure tank 51, through conduit 50, valve 48, conduit 47, to the upper end of cylinder 32 to drive the piston 31 downwardly, exhaust port 49 having been closed by operation of the valve 48. Simultaneously, the valve 55 is moved to establish communication between the lower end of the cylinder 32 to exhaust port 57. Thus, since air in advance of the piston 31 is quickly exhausted, the piston is driven downwardly in a rapid manner, and because of the inertia of the slide head 29, this head will strike the upper end of the handle H with a sharp blow.

When pressure is released from the foot valve 58, the valves 55 and 48 will return to normal position wherein conduit 47 is connected to exhaust port 49 of valve 48 and conduit 54 is connected to conduit 56. Thus the piston 31 will be returned to its upper position.

Usually only one blow of the slide head 29 is required to insert the lower end of the handle H to proper relation in the opening 33 of the tool head T, but prior to removal of the assembly an operator may inspect the assembly

through the openings 17 in the door 15. In certain cases, such as when the material of the handle is of unusual nature, or when tolerances between parts have not been maintained, it may be necessary for the operator to again depress the foot valve 58 so that the slide head 29 strikes the handle end with an additional blow. When the assembly is properly made, it may be easily removed from the casing after the door 15 has been opened.

In view of the foregoing, it will be apparent to those skilled in the art that I have accomplished at least the principal object of my invention, and it will also be apparent to those skilled in the art that the embodiment herein described may be variously changed and modified, without departing from the spirit of the invention, and that the invention is capable of uses and has advantages not herein specifically described; hence it will be appreciated that the herein disclosed embodiment is illustrative only, and that my invention is not limited thereto.

I claim:

Apparatus for forcing one end of a handle into an aperture in a tool head, comprising an elongated housing having an open side, a door having hinge connection with said housing and swingable to cover or uncover the open side of said housing, a power actuated ram, guide means carried by said housing in position to guide movement of said ram in a direction longitudinally of said housing, a platform extending transversely of said housing for supporting said tool head with the axis of its aperture generally aligned with the longitudinal movement of said ram, separable clamp means for encircling a portion of said handle and yieldably holding the latter generally axially aligned with longitudinal movement of said ram, yet permitting axial movement of said handle under influence of force exerted by said ram against its opposite end, said clamp means including a first portion rigidly carried by that side of said housing which is opposite said open side, and also including a second portion spring-pressed away from the inner side of said door and yieldably maintained in a transversely extending position relative to said door, said first and second portions being complementary, when said door is closed to engage about said handle portion, whereby a handle having its one end partially inserted in said tool head aperture may be positioned within said housing with said head supported on said platform and said handle portion disposed adjacent to said first clamp means portion, and whereby closing of said door causes said second clamp means portion to engage said handle portion and urge it to clamped relation between it and said first clamp portion so that said handle will be maintained in proper alignment with said head during the time said ram is moved to force the handle end into the head aperture.

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