June 3, 1958 E. F. TAYLOR 2,837,058

BACKFILL TAMPER

Filed March 31, 1955 2 Sheets-Sheet 1

Fig. 1

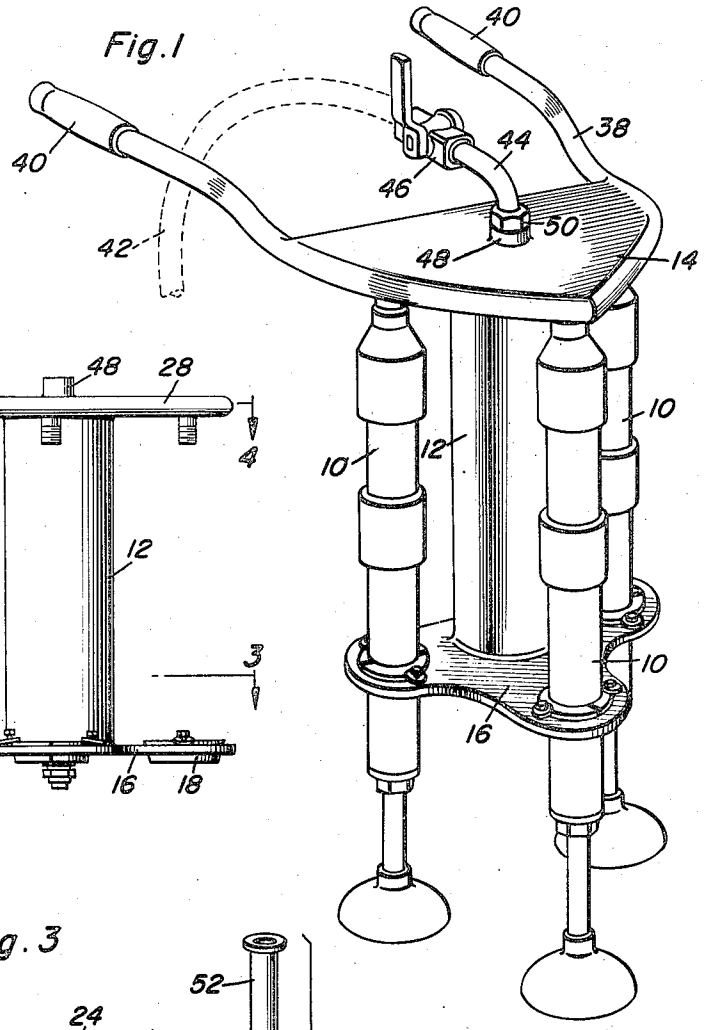


Fig. 2

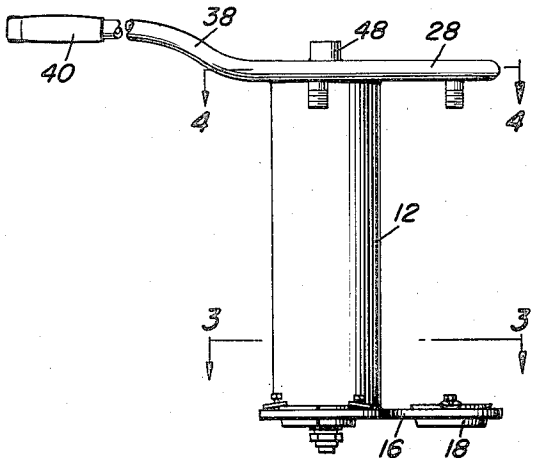
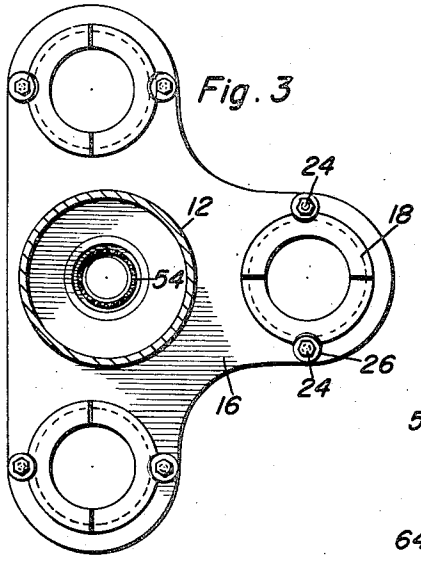


Fig. 3



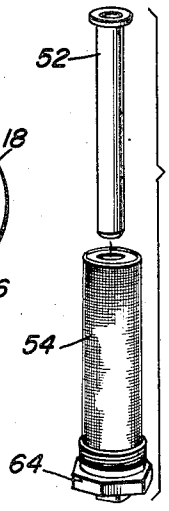


Fig. 8

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BACKFILL TAMPER

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Fig. 5

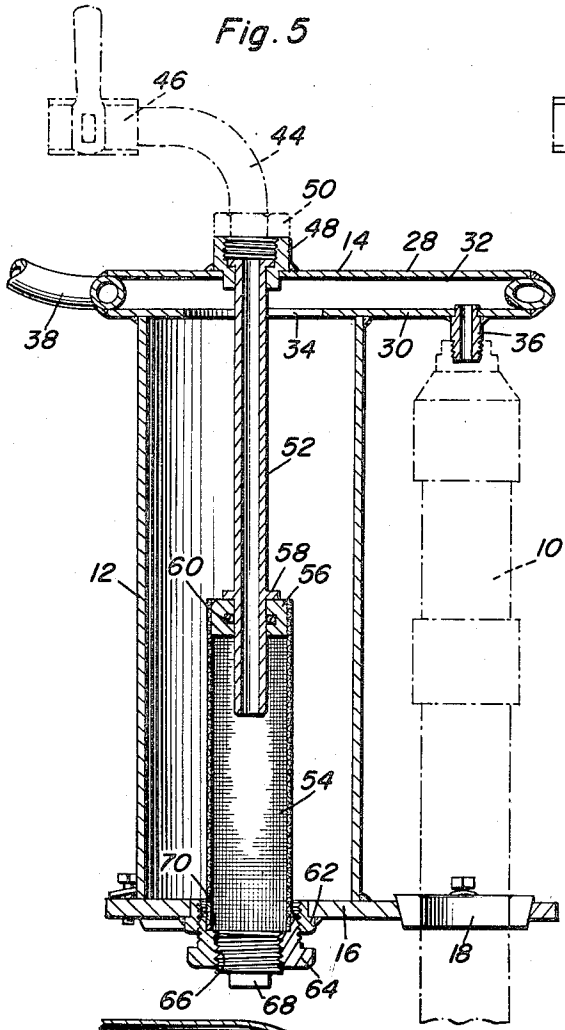
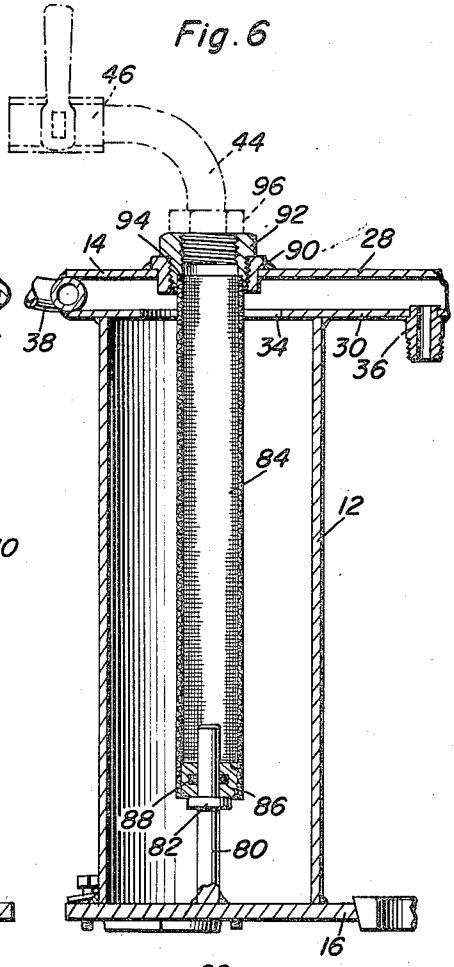


Fig. 6



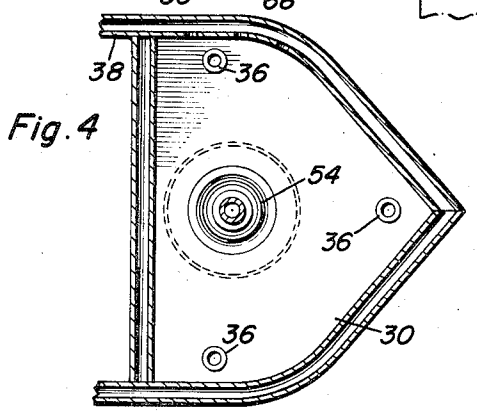


Fig. 4

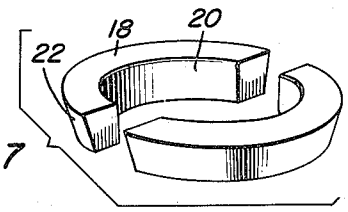


Fig. 7

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United States Patent Office

2,837,058

Patented June 3, 1958

2,837,058

BACKFILL TAMPER

Edward F. Taylor, Denver, Colo.

Application March 31, 1955, Serial No. 498,318

12 Claims. (Cl. 121—1)

This invention comprises novel and useful improvements in a backfill tamper, and relates generally to the type of apparatus disclosed in the reissue patent to John W. Brown which was reissued on January 5, 1954, as Reissue No. 23,763, for a Backfill Tamper.

The primary objects of this invention are to provide an apparatus whereby a plurality of conventional pneumatic reciprocating tools such as tamper units may be supported for easy maneuvering as a single unitary assembly, and wherein they may be supplied readily with fluid under pressure from a common source.

A further object of the invention is to provide a pneumatic tamping device wherein a plurality of conventional tamper units may be secured together and handled as a unitary assembly, to thereby greatly improve the tamping operation to be performed by the tamper units; and whereby the ease of handling and the general maneuverability of the device may be greatly increased through a more satisfactory and advantageous connection of the device to a source of fluid under pressure; and wherein the operation of the tamper units of the device may be further increased by the provision in a compact and highly satisfactory arrangement of a fluid filtering device within the unit.

A further general purpose of the invention is to provide a backfill tamping device wherein a plurality of conventional fluid pressure tamper units may be rigidly connected together to form a unitary assembly for improved maneuverability of the device, and whereby fluid pressure may be supplied in a much more satisfactory and advantageous manner to the individual tamper units of the device.

Another very important purpose of the invention is to provide a backfill tamping device in accordance with the preceding objects wherein the life and service of the device and its trouble-free operation may be greatly prolonged by the provision of means for quickly and easily replacing a fluid filter cleaner unit from the interior of the device; and wherein the fluid under pressure may be supplied to the individual tamper units at a much more even and uniform pressure.

These, together with other objects and advantages which will become subsequently apparent, reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a perspective view of one suitable embodiment of apparatus constituting a backfill tamper in accordance with the principles of this invention;

Figure 2 is an elevational view of the body and supporting framework of the device, the individual tamper units, together with the swivelling air hose connection, being removed therefrom;

Figure 3 is a horizontal sectional view taken upon an enlarged scale substantially upon the plane indicated by the section line 3—3 of Figure 2;

Figure 4 is a horizontal sectional view taken substantially upon the plane indicated by the section line 4—4 of Figure 2;

Figure 5 is a vertical central sectional view through the tamping device of Figure 2, the swivelling fluid pressure supply conduit and one of the tamper units being shown in dotted lines therein;

Figure 6 is a view similar to Figure 5 but of a modified construction of the apparatus;

Figure 7 is a perspective view of one of the interchangeable collets for detachably securing one end of the tamper units to the body portion of the apparatus; and

Figure 8 is a group perspective view of the filter cleaner construction of Figures 1–5 and of an air supply pipe member associated therewith.

In the accompanying drawings, and in the following specification, there is disclosed, by way of example of the principles of the invention only, a satisfactory embodiment of a backfill tamping device together with a slightly modified arrangement of a filter cleaner and its association with the rest of the apparatus. It should be understood that the principles of this invention are equally applicable to an apparatus wherein the holder and the tamper units may be fabricated and assembled by the manufacturer or one wherein the holder may be separately manufactured and the tamper units may be subsequently applied thereto.

In the embodiment of Figures 1–5, 7 and 8, the backfill tamper is shown as consisting of a plurality of conventional tamper units 10 which may be of any one of a large variety of pneumatic or fluid pressure tamper units now available upon the market, and which are rigidly secured together and associated into a unitary assemblage by their attachment to a supporting framework or holder. The latter may conveniently comprise a generally cylindrical, substantially vertical body or tank 12, the interior of which thus constitutes a chamber of the holder body. The body 12 is provided with top and bottom walls 14 and 16, respectively, which thus constitute closures for the chamber within the body. These walls may be secured to the member 12 in any desired manner, as by welding or the like, and the rim or edges of the walls overhang the sides of the member 12, as will be readily apparent from Figure 1.

The bottom wall 16 is provided with a plurality of apertures in which are secured interchangeable split bushings or collets 18. These members consist of half rings having downwardly convergent inner and outer walls 20 and 22 respectively, and whereby are formed conical tapering rings which are receivable in the apertures in the bottom wall 16. Pairs of bolts 24 provided with washers 26 serve to releasably clamp the collet rings or sections in the apertures. The arrangement is such that when a tamper unit is positioned as shown in Figures 1 and 5 in the collets, the latter may be drawn downwardly upon the bottom wall by means of the fastening bolts 24, and due to their conical curvature will be drawn together to clamp upon and thus rigidly secure the lower portion of the tamper unit. It is intended that the apertures in the bottom wall 16 shall be of sufficient size to accommodate a plurality of sizes of collets whereby tamper units of greatly varying diameter may be readily secured to the holder.

The top wall 14, as shown best in Figures 5 and 6, includes upper and lower plates 28 and 30 which are slightly vertically spaced from each other to provide a manifold chamber 32 therebetween. The bottom wall 30 is provided with an aperture or opening 34 which is positioned centrally of the cylindrical member 12 to thus provide unrestricted communication between the manifold chamber 32 and the chamber within the member 12. Thus, fluid under pressure within the chamber 12 may freely flow

into the manifold 32 for a purpose to be subsequently set forth.

The bottom plate 30 of the top wall 14, in vertical alignment with the apertures in the bottom wall 16, is provided with openings having depending tubular nipples 36. These nipples serve both to communicate the interior of the manifold 32 with the tamper unit 10, and being screw threadedly engaged with the upper end of the tamper units also serve to ansist in supporting the latter. The tamper units are thus supported by the nipples 36 from the manifold assembly, and by the collet construction from the bottom wall 16. By this means, the tamper units may be readily installed or removed in a manner which will now be clearly apparent.

A handle means is provided extending substantially horizontally from the top portion of the device whereby the apparatus may be readily maneuvered by the operator. This handle means preferably comprises a rod-like member 38 which may be of tubular construction having handle grips 40 at its opposite ends and having its mid portion extending into and forming a side wall of the manifold chamber 32 between the top and bottom plates 28 and 30 thereof. It will thus be seen that the handle is attached to the device throughout the periphery of the manifold assembly to which the tamper units are individually connected and attached.

It should be observed at this point that the manifold chamber 32 is of such size and its communication 34 with the interior of the body 12 is of such size that there is no restriction to fluid flow, and consequently substantially no diminution in fluid pressure as the pressure fluid is supplied from the chamber within the body 12 through the manifold assembly and the nipples 36 into the tamper units 10. Thus, "starving" of any tamper unit is substantially obviated, insuring that each unit will receive its full supply and volume of the pressure fluid for operating the same.

The present invention includes as an important feature thereof a provision for supplying the pressure fluid to the chamber within the member 12 in a greatly improved manner. For this purpose, pressure fluid from any suitable source is supplied, as, for example, by a flexible hose 42 to a conduit portion 44 of generally L-shaped configuration through a conventional manual control valve 46. The member 44 has a horizontally extending portion by which it is connected to the valve assembly 46, and a vertically extending portion which is swivelly received for horizontal swinging movement in an upstanding tubular boss 48, which is welded or otherwise secured to the top plate 28 of the manifold assembly and extends through this plate, a retaining nut or gland 50 being provided to retain the conduit portion 44 in the boss for horizontal swinging movement relative thereto.

Also secured in the boss 48 is a pipe member 52 forming a part of the pressure supply means for the apparatus, and which depends from the boss into the interior of the chamber within the body 12. By means of this pipe member, fluid under pressure is supplied directly to the interior of the chamber within the body.

It is also an important feature of this invention to provide an air filter screen means within the body for filtering the fluid supplied under pressure to the body prior to its delivery to the individual tamper units. In the arrangement shown in Figure 5, the filter screen 54 may conveniently consist of a foraminous cylindrical member having a top closure wall and reinforcing member 56 therein into which the end of the pipe 52 extends. The pipe may be provided with a lateral flange 58 resting upon the member 54, and any conventional sealing or packing means 60 may be provided between the pipe 52 and the member 56 as shown in Figure 5.

Means are provided to facilitate removal or application of the filter screen 54 to the air supply means. For this purpose, the bottom wall 16 is provided with an aperture having an internally threaded plug or gland 62. An externally threaded bushing 64 is received in this gland and is provided with an internally threaded bore 66 closed by a closure plug 68. The arrangement is such that the lower end of the filter screen 54 may be received in a shouldered recess 70 in the member 64 whereby, upon removal of the member 64, the filter may be inserted or replaced through the opening in the bottom wall, the member 64 constituting a retainer for engaging the lower end of a filter screen and urging the same upwardly into tight sealing engagement upon the flange 58. Thus, the pipe member 52 and the member 64 constitute means for securing, supporting and retaining the filter screen in a readily detachable manner within the body of the apparatus. The plug 68 constitutes a means whereby any condensate collecting within the body may be drained from the lower end of the chamber thereof.

In this form of the invention, it will now be understood that by virtue of the horizontally swivelling member 44 the tamping device may be readily maneuvered by the operator by using the hand grips 40, and this maneuvering will be unimpaired or unhampered by the connection to the air hose 42. Through this swivelling connection, the maneuverability of the device is greatly increased and especially where it is necessary to feed the air hose through horizontal ducts, trenches or tunnels to the place at which the tamping device is to be used.

The filter screen assembly, of course, strains any dirt or other particles from the pressure fluid supplied to the tamper units, thereby prolonging the life of the latter and preventing any detrimental effects upon the operation of the tamper by the penetration of such material into the valve mechanism or the working parts of the tamper.

The embodiment of Figure 6 is very similar to that of the embodiment previously described, except for a reversal of the arrangement of the filter screen. In this embodiment, the same reference numerals are used to designate the same parts as are employed in the preceding embodiment. However, in this form, the bottom wall 16 is imperforate and constitutes a permanent closure for the bottom of the member 12, but is provided with a central, upstanding, rod-like element 80 having a lateral flange 82 thereon. The filter screen member 84 may be identical with that previously described, but merely inverted as to its positioning in the body; but if desired may be considerably longer than the screen 54, since greater space is available for positioning the same in the chamber of the body 12. Thus, at its lower end, the screen 84 is provided with a closure member 86 similar to the member 56, and provided with a packing or sealing member 88 similar to the member 60.

However, the upper plate 28 of the top wall 14 is provided with an internally threaded bushing or sleeve 90 similar to the sleeve 62, in which is removably received an externally and internally threaded gland or retaining member 92. Similar to the previously described member 64. This retainer is provided with a shouldered recess 94, similar to the recess 70 for receiving the upper end of the filter screen 84 therein. The swivelling conduit portion 44 is swivelly received in the member 92 and retained therein as by a nut or gland 96 in the same manner as that effected by the gland 50 in Figure 5.

In this arrangement, it will be seen that the filter screen may be removed and replaced through the opening in the top wall rather than through the opening in the bottom wall as in the preceding form. However, the filter screen is supported and retained in position by means of the retainer 92 in the top wall and a rod-like supporting member 80 of the bottom wall in substantially the same way as the filter screen of Figure 5 is retained by the members 52 and 64.

This arrangement provides a ready means for replacing the filter screens as the same may become necessary.

From the foregoing, the construction and operation of the device will be readily understood and further ex-

planation is believed to be unnecessary. However, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the appended claims.

What is claimed as new is as follows:

1. A holder for a pneumatic reciprocating tool comprising a supporting body having a fluid receiving and delivering chamber therein, means adapted to supply fluid under pressure into said chamber, means for supporting a plurality of fluid pressure operated elements upon the exterior surface of said body, means for delivering fluid from said chamber to said plurality of fluid pressure operated elements, a metallic fluid screen disposed in said chamber, a pair of supports for rigidly holding said screen at its opposite ends, said chamber having a pair of walls, one of said walls having an opening therein, one of said supports being mounted in said opening and being removable therethrough with the screen.

2. The combination of claim 1 wherein said pair of walls comprises top and bottom walls, one of said supports being mounted upon each of said walls.

3. The combination of claim 1 including a pipe member in said chamber and carried by one of said walls, said supply means being connected to said pipe member, said screen surrounding the outlet end of said pipe member.

4. The combination of claim 1 including a rod-like member on the other of said walls from that having the opening, said rod-like member comprising one of said pair of supports.

5. A holder for a pneumatic reciprocating tool comprising a supporting body having a fluid receiving and delivering chamber therein, means adapted to supply fluid under pressure into said chamber, means for supporting a plurality of fluid pressure operated elements upon the exterior surface of said body, means for delivering fluid from said chamber to said plurality of fluid pressure operated elements, a metallic fluid screen disposed in said chamber, said chamber having top and bottom walls, support means carried by each of said walls for supporting said screen therebetween.

6. The combination of claim 5 wherein one of said walls has an opening of sufficient size for passage of the screen therethrough, one of said support means being engaged in said opening and being operable to clamp the screen against the other support means.

7. The combination of claim 5 wherein one of said walls has an opening of sufficient size for passage of the screen therethrough, one of said support means being engaged in said opening and being operable to clamp the screen against the other support means, the other support means comprising a pipe communicating with the supply means and extending into the screen.

8. The combination of claim 5 wherein one of said walls has an opening of sufficient size for passage of the screen therethrough, one of said support means being engaged in said opening and being operable to clamp the screen against the other support means, the other support means comprising a rod-like member integral with the other wall from that having the opening and engaging the screw.

9. The combination of claim 5 wherein one of said walls has an opening of sufficient size for passage of the screen therethrough, one of said support means being engaged in said opening and being operable to clamp the screen against the other support means, the other support means comprising a rod-like member integral with the other wall from that having the opening and engaging the screw and extending thereinto.

10. The combination of claim 5 wherein one of said support means includes a pipe extending into said screw intermediate the ends thereof and having communication with said fluid supply means.

11. The combination of claim 5 wherein one of said support means includes a pipe extending into said screw intermediate the ends thereof and having communication with said fluid supply means, said pipe having a laterally enlarged portion abutting against the end of said screen for clamping the latter against the other support means.

12. The combination of claim 5 wherein one of said walls is provided with an opening, one of said support means comprising a bushing received in said opening, said screw being mounted at one end in said bushing, said bushing and screen being removable through said opening.

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