P. STEPANOFF.

SHRAPNEL LOADING MACHINE.

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1,229,666.

Patented June 12, 1917.

Fig. 1,

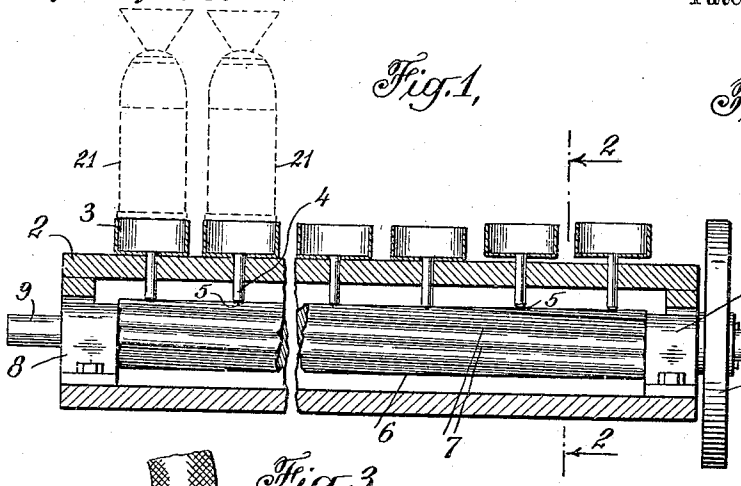


Fig. 2,

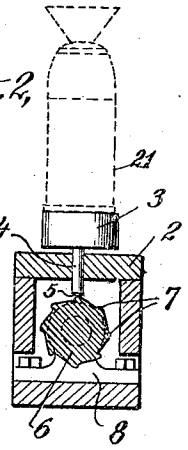


Fig. 3,

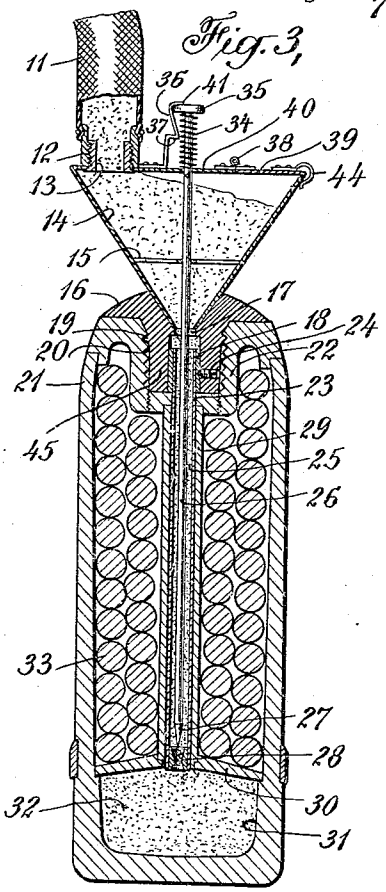


Fig. 5.

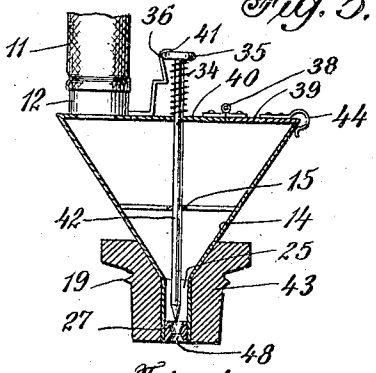
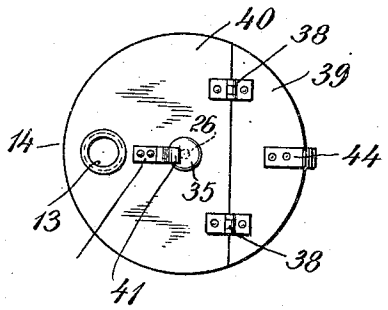


Fig. 4,



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SHRAPNEL-LOADING MACHINE.

1,229,666. Specification of Letters Patent. Patented June 12, 1917.

Application filed April 29, 1916. Serial No. 94,306.

To all whom it may concern:

Be it known that I, PETER STEPANOFF, a subject of the Emperor of Russia, and resident of Petrograd, Russia, have made a certain new and useful Invention Relating to Shrapnel-Loading Machines, of which the following is a specification, taken in connection with the accompanying drawing, which forms part of the same.

This invention relates especially to machines for loading shrapnel shells with powder after they have been manufactured and filled with bullets. The shells may then have attached to them a suitable powder feed connection comprising a feed hopper which may have a connector cap screwed into the fuse socket of the shell so as to support a feed tube extending the desired distance into the ignition tube of the shell. The hopper may be supplied with powder as through a hose connection so that this powder can continuously flow from the hopper into the powder chamber at the base of the shell when a manually operated cut-off valve is open which may coöperate with a constricted throat at the end of the feed tube. To facilitate packing of the powder charge the shells after the hopper and powder feeding connections are attached thereto may be placed on a jolting support as by placing each shell in a socket receiving a number of sharp impact or jolting impulses per second so as to forcibly and firmly pack the powder grains within the shell chamber after which the valve may be closed and the powder feeding connection removed from the shell and connected to another.

In the accompanying drawing showing in a somewhat diagrammatic way an illustrative embodiment of this invention,

Figure 1 is a longitudinal vertical section.

Fig. 2 is a transverse section thereof taken substantially along the line 2—2 of Fig. 1.

Fig. 3 is an enlarged vertical section showing the powder feed connections coöperating with a shell.

Fig. 4 is a top view thereof; and

Fig. 5 is a view of another form of feed hopper and connections for attachment to the shell.

In the illustrative embodiment of this invention shown in the drawing the jolting device may comprise a suitable jolting table or frame 2 in connection with which a jolt cam such as 6 may be mounted as by having its drive shaft 9 supported in the bearings 8 secured to the table or frame. This shaft and cam may be driven at the desired speed as through the drive pulley 10 so that the cam projections 7 which preferably have a somewhat spiral arrangement around the cam are adapted to give some six to ten hundred jolt impulses more or less per minute to each jolting support or connected member coöperating with the cam. To conveniently support the shrapnel shells during this jolting operation a series of jolting supports or sockets such as 3 may be mounted on the jolting table and each socket may have its attached stem 4 extending through a suitable guide hole or bearing in the table so that its tip 5 coöperates with the jolt cam 6 as indicated in Figs. 1 and 2 so as to effect the rapid jolting movement of this support which may be moved vertically an eighth of an inch more or less each time a cam projection passes under its tip. These sockets 3 and connected stems 4 may, if desired, be interchangeable so that they may be readily removed and replaced by other sockets of such size as to accommodate a different shrapnel shell if desired, it being convenient to have each jolting table of such size as to accommodate ten or so of these supports, although more or less can of course be mounted in a single unit.

The shrapnel shells 21 which are adapted to coöperate with these jolting supports 3 may be of any suitable construction and may comprise as somewhat diagrammatically indicated in Fig. 3 the shell body or casing 21 and the internal diaphragms or parts 30, 24, connected to the ignition tube 29 so as to properly support the charge of shrapnel balls or bullets 33 above the powder chamber 31 at the base of the shell. The powder feed connections may, if desired, comprise a feed hopper 14 supported by the connector cap 16 which preferably has a depending neck formed with one or two partial threads 19 adapted to coöperate with the threaded fuse socket 20 so that the cap may be readily screwed thereinto to firmly support the hopper and connected powder feed devices during the filling operation. If desired, the hopper may be of relatively small capacity and may be supplied with suitable powder such as ordinary granular black powder used for this purpose through a feeding hose or flexible connection 11 having its end 12 screwed on the connected threaded flange 13 on the cover 40 of the hopper

which may, if desired, have a lid portion 39 hinged about the pins 38 and normally held in closed position as by the spring catch 44.

If it is desired to have the packed powder charge 32 merely fill the powder chamber 31 at the base of the shrapnel shell so as to leave the ignition tube 29 of the shell empty of such granular powder so that it may be filled with a charge of special powder, the powder feed connections may then advantageously comprise a feed tube, such, as 23, secured as by the screw 24 to the neck 45 so as to extend down within the ignition tube of the shell substantially to the powder chamber 31 at its base where this feed tube may be provided with a constricted throat, such as 28. It is of advantage to have a cut-off valve arranged in connection with these powder feed devices and for this purpose the cut-off valve 27 which may have the conical shape indicated may be formed on the end of the valve stem 26 extending through the feed tube and supported as in a suitable guide 15 in the hopper and a guiding aperture in the cover 40 thereof so that normally this valve is held in the open position indicated in Fig. 3 in which an annular feed passage 25 is provided for the powder between this valve and the surrounding feed tube 23. A suitable head, such as 35, may be formed on this valve stem which may normally be held in raised position as by the return spring 34 so that this head may normally be held in engagement with the alining portion 41 of the spring retainer 36 which may as indicated be mounted on the cover of the hopper while when pushed downward by the operator this head is forced past the retainer so as to snap under the locking projection 37 thereof which serves to hold the shut-off valve in closed position within the constricted throat 28 until the spring retainer is moved laterally to a sufficient extent to release the head and allow it to snap up into the raised position indicated.

When the shell 21 to which these powder feed connections have been secured as above described is placed in the jolting support 3 the granular powder from the feed hopper 14 rapidly passes under this jolting action down through the feed passage into the powder chamber 31 at the base of the shell into which the powder is tightly packed, the grains being rapidly and forcibly packed together so as to completely fill the chamber with such a tightly packed powder charge that its subsequent displacement during transportation is rendered practically impossible. The operator can test the filling of the powder chamber from time to time by pressing down the valve stem 26 which moves the cut-off or detector valve 27 quite freely into the throat when the upper part of the powder chamber is empty or only loosely filled while encountering considerably more resistance when the packed powder charge fills the entire chamber up to the constricted throat 28 of the feed tube. When the operator finds that the powder chamber is properly filled he forces this cut-off valve 27 down into closed position which substantially tightly closes the discharge end of this feed tube, so that when the shell is removed from the jolting support and the hopper and connector cap are unscrewed and removed from the shrapnel shell there is substantially no leakage of powder so that these powder feed connections may be disengaged from one shell and secured to another without waste of powder.

If it is desired to use the same granular powder to fill the ignition tube 29 of the shrapnel shell as the main powder chamber 31 thereof, the powder feed connection may be formed with a throat 48 in the lower part of the neck 43 of the connector, as shown in Fig. 5, so that the entire ignition tube of the shell will be filled with powder when the shut-off valve 27 is forced home by downward movement of its stem 42 to close this throat 48 and allow the transfer of this powder feed connection to another shell.

This invention has been described in connection with a number of illustrative embodiments, forms, proportions, parts, materials and arrangements, and methods of use, to the details of which disclosure the invention is not of course to be limited, except as defined by the appended claims.

I claim:

1. In shrapnel loading machines, a series of interchangeable jolting supports each adapted to receive a shrapnel shell, a series of powder feed connections to be removably secured to shrapnel shells and each comprising a feed hopper, a connected supply hose to supply powder thereto, a connector cap secured to said feed hopper and formed with a neck having a partial thread to be screwed into the fuse socket of the shell, a feed tube removably secured to said neck and adapted to extend within the ignition tube of the shell adjacent the powder chamber at the base of the shell, a constricted throat formed at the end of said feed tube, a conical cut-off detector valve mounted within said feed tube to coöperate with said throat in determining the filled condition of the powder chamber, a stem on said valve extending through said hopper, a return spring to normally hold said stem in raised position, a head on said stem and a spring retainer coöperating with said head to hold the connected cut-off valve in raised open position or in closed position substantially closing the constricted throat of said feed tube during transfer of said feeding connection from one shell to another.

2. In shrapnel loading machines, a series of interchangeable jolting supports each

adapted to receive a shrapnel shell, a series of powder feed connections to be removably secured to shrapnel shells and each comprising a feed hopper, a feed tube adapted to extend within the ignition tube of the shell, a constricted throat formed at the end of said feed tube, a detector cut-off valve mounted within said feed tube to coöperate with said throat, a stem on said valve extending through said hopper, a head on said stem and a retainer coöperating with said head to hold the connected cut-off valve in raised open position or in closed position substantially closing the constricted throat of said feed tube during transfer of said feeding connection from one shell to another.

3. In shell loading machines, a jolting support adapted to receive and jolt a shell, a powder feed connection to be removably secured to shells and comprising a powder feed hopper, a feed tube adapted to extend within the ignition tube of the shell, a constricted throat formed at the end of said feed tube and a detector cut-off valve mounted within said feed tube to coöperate with said throat and determine the filled condition of the shell.

4. In shrapnel loading machines, a powder feed connection to be removably secured to a shrapnel shell and comprising a feed hopper, a connected supply hose to supply powder thereto, a connector cap secured to said feed hopper to be screwed into the fuse socket of the shell and provided with a constricted throat through which the powder passes into the shell, a cut-off valve mounted to coöperate with said throat and means to hold said cut-off valve in open position or in closed position substantially closing said constricted throat during transfer of the feeding connection from one shell to another, a jolting support to receive the shell and means coöperating with said support to jolt the shell during filling and to pack the powder therein.

5. In shrapnel shell loading machines, a powder feed connection to be removably secured to a shell and comprising a feed hopper, a connected supply hose to supply powder thereto, a connector cap secured to said feed hopper to be screwed into the fuse socket of the shell and provided with a feed tube adapted to extend within the ignition tube of the shell and with a constricted throat through which the powder is discharged into the shell, a cut-off valve mounted to coöperate with said throat and spring retainer means to hold said cut-off valve in open position or in closed position substantially closing said constricted throat during transfer of the feeding connection from one shell to another.

6. In shell loading mechanism, a powder feed connection to be removably secured to a shell and comprising a feed hopper, a connected supply hose to supply powder thereto, a connector cap secured to said feed hopper to be screwed into the fuse socket of the shell and provided with a constricted throat through which the powder is discharged into the shell, a cut-off valve mounted to coöperate with said throat and means to hold said cut-off valve in closed position substantially closing said constricted throat during transfer of the feeding connection from one shell to another.

7. In shell loading machines, a powder feed connection to be removably secured to shrapnel shells and comprising a feed hopper, a connected supply hose to supply powder thereto, a connector cap secured to said feed hopper and adapted to be secured to the shell, a feed tube secured to said cap and adapted to extend within the ignition tube of the shell adjacent the powder chamber at the base of the shell, a constricted throat formed at the end of said feed tube, a detector cut-off valve mounted within said feed tube to coöperate with and protrude through said throat in determining the filled condition of the powder chamber, a stem on said valve extending through said hopper, a head on said stem and a retainer coöperating with said head to hold the connected cut-off valve in raised open position or in closed position substantially closing the constricted throat of said feed tube during transfer of said feeding connection from one shell to another.

8. In shell loading machines, a powder feed connection to be removably secured to shells and comprising a powder feed tube adapted to extend within the shell, a constricted throat formed at the end of said feed tube and a detector device mounted within said feed tube to coöperate with said throat and be manually projected through said throat to determine the compacting of the powder within the adjacent part of the shell.

PETER STEPANOFF.

Witnesses:
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JESSIE B. KAY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."