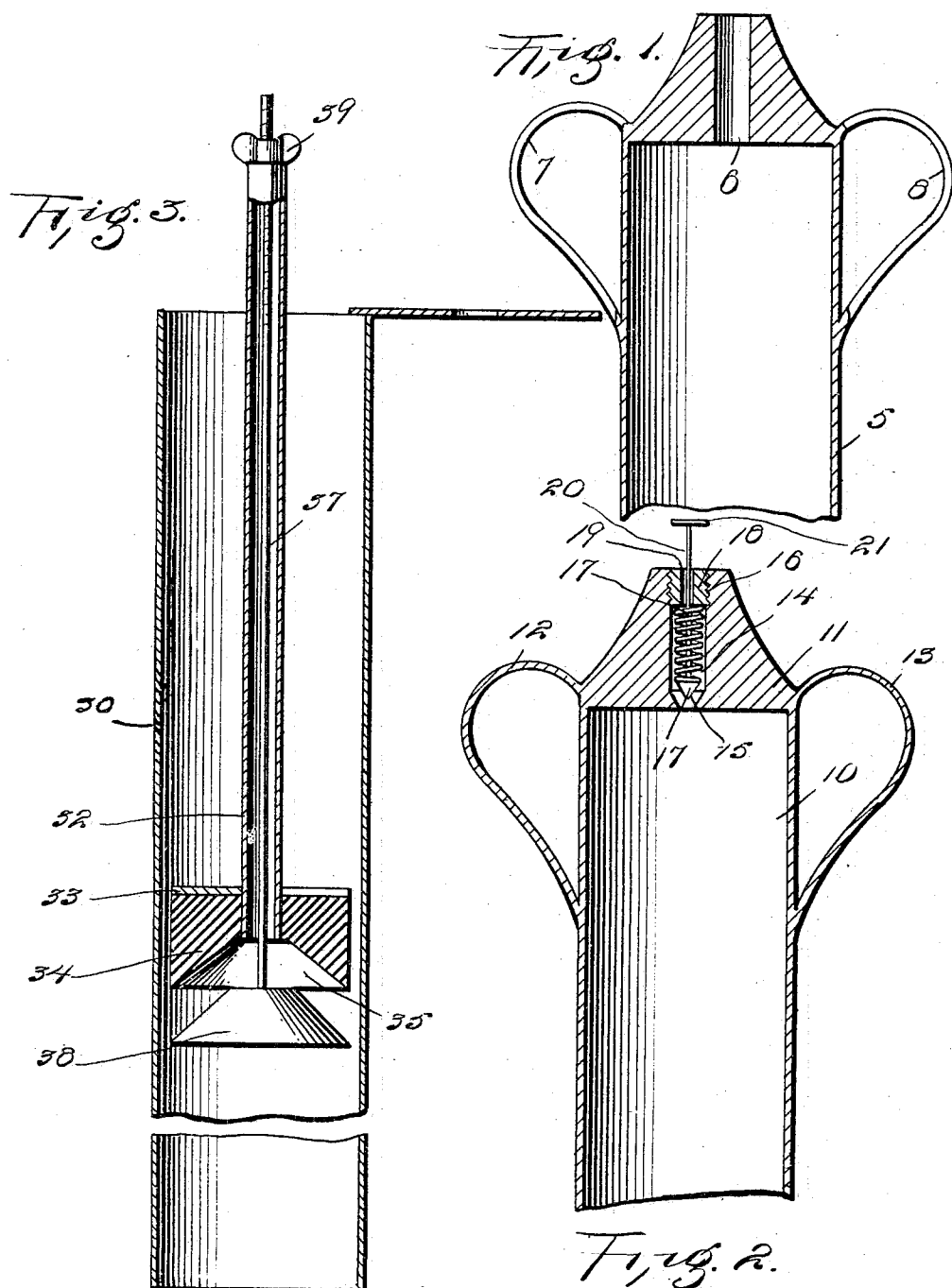


L. W. WALTER.
SAMPLING TUBE.

APPLICATION FILED NOV. 23, 1903.

NO MODEL.



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SAMPLING-TUBE.

SPECIFICATION forming part of Letters Patent No. 766,205, dated August 2, 1904.

Application filed November 23, 1903. Serial No. 182,360. (No model.)

To all whom it may concern:

Be it known that I, LEE W. WALTER, a citizen of the United States, residing at Wheeling, in the county of Ohio, State of West Virginia, have invented certain new and useful Improvements in Sampling-Tubes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to sampling-tubes such as are employed for abstracting a sample of a material in bulk or packages, the object of the invention being to provide a device which will be particularly adapted for use in connection with bolted solids, such as plaster-of-paris, cement, and similar materials.

In the drawings forming a portion of this specification, and in which like numerals of reference indicate similar parts in the several views, Figure 1 is a longitudinal section through a sampling-tube, showing a simple embodiment of the broad invention. Fig. 2 is a view similar to Fig. 1, showing a tube having a valve located permanently at one end of the tube. Fig. 3 is a view similar to Figs. 1 and 2, showing a tube having a valve which is adapted to be shifted longitudinally within the tube.

Referring now to the drawings, and more particularly to Fig. 1 thereof, there is illustrated an embodiment of the invention consisting of a cylindrical tube 5, which in its operation is passed longitudinally into a body of material to be sampled, so that a portion of said material will enter the tube and when the tube is withdrawn the contained material will remain in the tube and be withdrawn with it, after which it may be dumped out of the tube and represent a true sample of the material from which it was taken.

It will be understood that as the tube is withdrawn from the bulk of material there is a suction created, owing to the tendency to form a vacuum, and this suction in practice acts to withdraw the material from the tube. If the outer end of the tube be closed, then by reason of the fact that no air can enter above the sample the sample within the

tube will not be withdrawn from it, but will be withdrawn with the tube.

To facilitate closure of the outer end of the tube, the latter is tapered, and centrally thereof is formed an air-passage 6 of such size as to permit free passage of air from the tube during the process of insertion of the latter into the material to be sampled, the diameter of this air-passage being such that it may be covered by the thumb of the operator to prevent ingress of air when the tube is withdrawn from the material. The extreme end of the tube surrounding the air-passage is smooth, so that the thumb may be held over the air-passage and form an air-tight closure therefor.

To facilitate application and removal of the tube, handles 7 and 8 are secured at opposite sides of the tube directly adjacent to the tapered portion thereof, these handles being of any desired shape.

In the operation of this form of tube an opening is made in the package to be sampled, the tube is passed longitudinally into the bulk of material with the air-passage open, the thumb is then placed over the outer end of the air-passage, and the tube is then withdrawn, when it will be found to contain a sample of the material, which may be then removed and tested in the usual manner.

In Fig. 2 of the drawings there is shown a form of the invention including a tube 10, corresponding to tube 5, having one end tapered, as shown at 11, and having at opposite sides adjacent to the tapered portion the handles 12 and 13. Through the tapered end portion is an air passage 14 of lesser diameter than the body of the tube, and at the inner end of which passage is a valve-seat 15, above which are threads 16. A valve 17 is arranged to engage the seat to close the air-passage, this valve opening outwardly and being held normally and yieldably in its seat by means of a helical spring 17', which bears at one end against the valve and at the opposite end against a plug 18, that is engaged with the thread 16. The plug has a central passage 19 therethrough, through which is loosely passed the stem 20 of the valve, said stem having a handle 21 at its upper end, which may

be grasped to raise the valve when desired. With this form of the invention instead of closing the air-passage by means of the thumb of the operator it is normally closed by the valve. When the tube is introduced in the bulk of material to be sampled, the material entering the tube will force the air in the tube past the valve and out through the air-passage, providing the spring is under proper tension, and when the tube is withdrawn from the bulk of material the suction, in connection with the spring, will serve to set the valve firmly in its seat and close the air-passage, thus preventing ingress of air. It will of course be understood that the valve may be manually operated, if desired.

It is found in practice that it is desired at times to remove from a bin a sample of material when the depth of material in the bin is less than the length of the tube. The result is that if a tube such as shown in Figs. 1 and 2 is passed downwardly into the material in the bin there will be left an air-space between the upper end of the tube and the level of the sample in the tube. If the tube is then raised from the material, the suction will serve to expand the air above the sample to such an extent as to permit a portion of the sample to pass from the tube. The construction illustrated in Fig. 3 is provided to eliminate this air-space.

Referring now to Fig. 3 of the drawings, it will be noted that the sampler in this instance consists of a tube 30, similar to the tubes 5 and 10, through the upper end of which is slidably passed a tubular piston-rod 32, having fixed thereon just above its lower end a disk 33. An expansible piston 34 is mounted upon the hollow rod and bears against the lower face of the disk, the lower end of the piston projecting below the piston-rod and having a conical recess 35 in its lower end, with which the bore of the hollow piston-rod communicates. Through the hollow piston-rod is passed a rod 37, having at its lower end a conical plug 38, which is adapted to enter the recess 35 and when drawn thereinto to expand the piston into close contact with the inner face of the tube 30. To thus draw the plug into the recess, the upper end of the rod 37 is threaded

and a thumb-nut 39 is engaged therewith. When this thumb-nut is screwed down into contact with the hollow piston-rod, the rod 37 is drawn upwardly and the plug is pressed into the recess. With this construction after the tube has been passed into the bulk of material to be sampled, at which time the piston is at the top of the tube, said piston is moved downwardly in the tube against the sample, and the plug is then manipulated to expand the piston, so as to form an air-tight closure for the tube directly above the sample. There being then no air-space between the piston and sample, the tube may be withdrawn, and the entire sample will be removed with it.

It will be understood that in practice other modifications may be made and any suitable materials and proportions may be used for the various parts without departing from the spirit of the invention.

What is claimed is—

1. A sampling-tube comprising a body portion having an open end for ingress and egress of the sample and means for hermetically closing the body portion above said end, the interior diameter of said open end being the same as that of the body portion, to permit the tube to cut from a solid body a sample to fill the interior of the body.

2. A sampling-tube comprising a body portion of constant diameter having an open end for ingress and egress of the sample and means for hermetically closing the body portion above said end, the closing means being shiftable longitudinally of the body portion.

3. A sampling-tube having an inlet for the sample at one end and having an air-passage at the opposite end, an inflexible piston within the tube between said inlet and passage, and means extending exteriorly of the tube for expanding the piston, said piston being shiftable longitudinally of the tube and being adapted when expanded to close the tube.

In testimony whereof I affix my signature in presence of two witnesses.

LEE W. WALTER.

Witnesses:

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