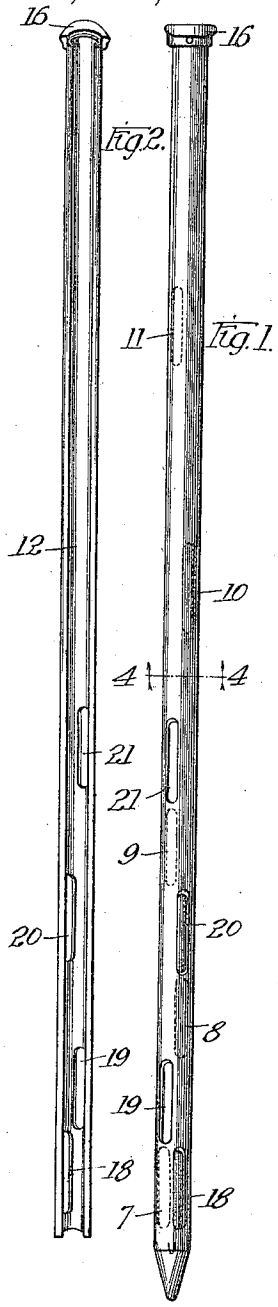
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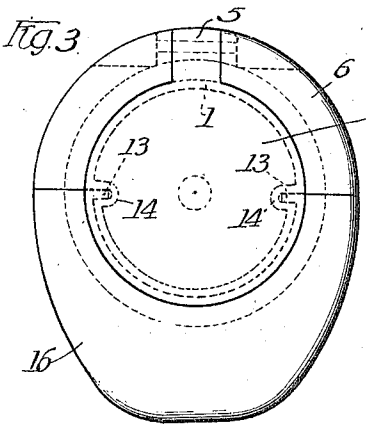
GRAIN TRIER.

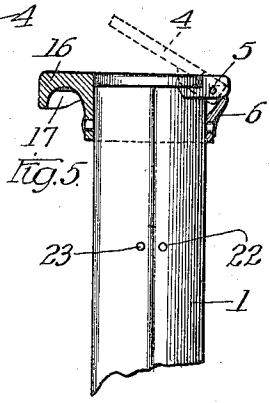
APPLICATION FILED DEC. 2, 1914.

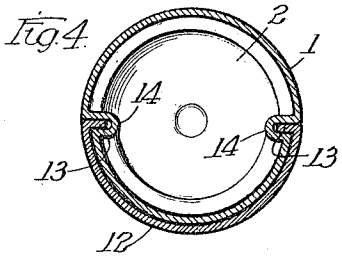
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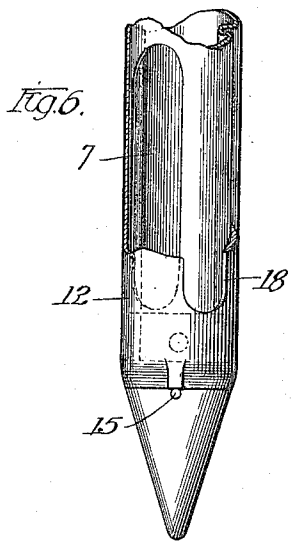
Patented Aug. 31, 1915.

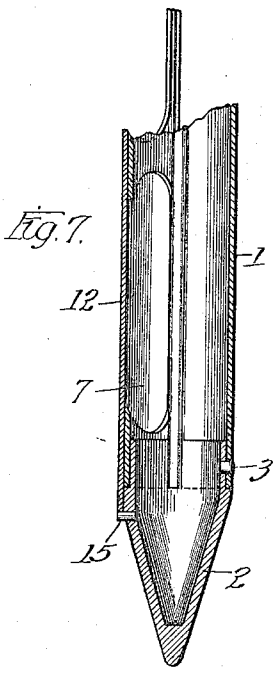



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# UNITED STATES PATENT OFFICE.

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## GRAIN-TRIER.

1,152,133. Specification of Letters Patent. Patented Aug. 31, 1915.

Application filed December 2, 1914. Serial No. 875,070.

*To all whom it may concern:*

Be it known that I, EDWARD J. WAREHAM, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Grain-Triers, of which the following is a specification.

My invention relates to grain triers or testers for sampling grain.

It will be understood that it is customary in purchasing grain by the carload for the purchaser to send an inspector who usually samples the grain by taking three samples, one at the center of the car, and one near each end thereof. In taking these samples, the inspector endeavors to obtain portions at various points in the vertical section so that the full samples will be typical of the section as a whole. To do this, however, is very difficult by the present means and methods, and the object of my invention is to provide means wherewith to enable the inspector to readily obtain samples at different points in the section and prevent these samples or partial samples from becoming mixed with the grain from other parts of the section.

I accomplish my object by the device illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the complete device. Fig. 2 is a side elevation in perspective of the valve. Fig. 3 is a top plan view of the device drawn upon an increased scale. Fig. 4 is a plan section on the line 4—4, Fig. 1. Fig. 5 is a side elevation partly in section illustrating the operation of the lid. Fig. 6 is a side elevation of the lower portion of the device with part of the valve broken away. Fig. 7 is a vertical central section of the parts shown in Fig. 6.

Similar numerals refer to similar parts throughout the several views.

The body 1 is in the general form of a hollow cylinder preferably about five feet high and one inch and three-quarters in external diameter, although these dimensions may be varied to suit the conditions in hand. By preference, this body is made of thin steel tubing. It is closed at the lower end by a conically pointed member 2 which is fastened to the body by the aid of a rivet 3 or other appropriate means. In this, the preferred form, the upper end of the body is provided with a lid 4 hinged upon a pin 5 mounted in the half collar 6 fastened at the upper end of the body. This half collar also imparts a finished appearance to the device and protects the edges of the lid. The collar also affords means whereby the device may be more readily manipulated. As best shown in Fig. 3, this half collar extends only part way around the body; for example, about 180 degrees.

A number of ports or openings 7, 8, 9, 10, 11 are formed in the side of the body for the purpose of admitting the grain at various points in the section. According to the present design, there are five of these ports and they are approximately four inches long and one inch wide, although these dimensions may, of course, be varied. In the design illustrated, the lowest port is practically at the bottom of the body, the next is four inches above it, the next is four inches above that, the next is eight inches above that, and the last is eight inches above that. The first, third and fifth are in line with each other but out of line with the others. The second and fourth are in line with each other. These ports, which serve to admit the grain, are opened and closed by means of a valve 12, the preferred construction of which is here illustrated. Generally speaking, this valve is semi-cylindrical in form and of a height approximately equal to the height of the body. It is preferably formed of steel tubing and at the marginal edges has inwardly extending flanges 13, 13 which fit slidingly in the grooves 14, 14 formed in the body 1, as best shown in Fig. 4. It is desirable that the grooves 14 be located approximately 180 degrees apart, that is, approximately on diametrically opposite sides of the device. It is also desirable that the portion of the body covered by the valve be depressed slightly so that the external diameter of the valve is equal to the external diameter of the remaining portion of the body. This imparts a finished appearance to the device and affords protection to the valve by reducing the liability to injury by reason of contact with external objects. A stop 15, which in the present design is located in the point 2 and engages the lower end of the valve, normally holds the valve in closed position with its upper end flush with the upper end of the body 1, as shown in Fig. 1. The valve is provided with a half collar 16

which corresponds to the half collar 6 and with it forms a cap for the device. A recess 17 is formed on the underside of collar 16 for receiving the ends of the fingers of the inspector. The part 16, therefore, also performs the function of a handle or finger-piece by which the valve may be operated. Ports or openings 18, 19, 20, 21 are formed in the sides of the valve, as best shown in Fig. 2. These are arranged in such manner that when the valve is in closed position all of the ports in the body 1 will be closed, but will be opened successively commencing with the bottom port when the valve is gradually raised. In the design shown in the drawings, the ports in the valve are of substantially the same length and width as the ports in the body and are four in number. The ports 18 and 20 are in line with each other and the ports 19 and 21 are in line with each other, the last two ports, however, being out of line with the first two. The alinement is such, also, that when the valve is closed the port 18 will be out of register with the port 7 but in line with the ports 8 and 10. The ports 19 and 21 are in line with the ports 9 and 11. The lower end of port 19 is on a level with the upper end of port 18. Port 20 is four inches from port 19 and port 21 is four inches from port 20.

In operation, when it is desired to take a sample of the grain in a car or elsewhere, the valve is first closed and the device is forced down into the body of grain as far as convenient or at least until the uppermost port 11 in the body is submerged. The valve is then raised about four inches, with the result that the lowermost port 7 in the body is opened while all of the remaining ports remain closed. The inspector then rotates the device slowly back and forth through a few degrees about its longitudinal axis, the result being that the grain opposite to the open port flows into the body of the device. When the inspector thinks that a sufficient quantity has entered, he raises the valve to the next stage or station (in the present design four inches) and thereby uncovers the port 8. He then rotates the device gently back and forth a few degrees as before, and permits the grain at this level to enter the body of the device. After sufficient grain has entered through the second port in the body the third port is opened by raising the valve four inches more, after which the fourth port may be uncovered by raising the valve another four inches, and finally the fifth port is opened by raising the valve a final four inches. In order that the inspector may determine just how far to lift the valve each time so as to bring the ports accurately into register with each other a gage is provided, this gage consisting preferably of a rivet or similar marker 22 fastened in the body 1 in position to cooperate with a series of rivets or other similar markers 23 on the valve, the rivets on the valve being located four inches apart. By bringing a rivet on the valve to the elevation of the rivet on the body the inspector can determine that the port is open and can determine just which port is open. After all of the ports have been uncovered in turn, and the body of the device filled to the desired level with grain, the inspector, without removing the device, lowers the valve to closed position. This traps the grain within the body of the trier, after which the device as a whole is withdrawn. The inspector then, holding the lid 4 closed, turns the device upside down and then, releasing the lid, empties the contents of the device into a bag or other receptacle.

As a result of this construction and manipulation, a sample is obtained from different elevations or points in the section and the inspector is certain that none of the grain which has once entered the body of the trier can escape nor can any grain from any other point in the section enter during the act of withdrawing the device from the body of grain. The inspector may thus be assured that he has obtained a fair sample of the grain as a whole, and may also be assured that, without exercising any particular degree of skill, he has obtained his sample uniformly with the sample which he may have previously obtained and which he may thereafter obtain. In other words, by the use of this device it is possible not only to obtain a sample which is typical of the body as a whole, but it is possible to obtain samples which are uniform with each other.

This device, to a great extent, eliminates the personal factor, and different inspectors equipped with triers of my construction will all operate the device with practically the same results.

From the foregoing it will be seen that while the top of the uppermost port 11 in the body is forty inches from the top to the lowermost port 7, all of the ports in the body may be uncovered by moving the valve but twenty inches. In other words, the different ports are so arranged that the valve need be moved but half the distance between the uppermost and lowermost ports in the body. This is of utmost importance as will be readily appreciated by those who have operated devices of this general character. Grain is usually shipped in box cars and frequently there is less than two feet between the roof of the car and the top of the grain. But in my device the valve movement is so small that it can take place even in a fully loaded car without moving the device from the position in which the sample is taken until after the valve is closed.

Having thus described my invention, what

I claim as new and desire to secure by Letters Patent is:—

1. A device of the class described having a tubular body closed at the lower end and having ports arranged one above the other in said body, adjacent ports being out of alinement with each other both longitudinally and circumferentially, and a non-rotatable slide valve normally holding said ports closed, said valve having a plurality of ports arranged at different positions lengthwise of the valve, some of the ports in the valve being in line to register with some of the ports in the body as the valve is moved to open position.

2. A grain trier consisting of a tubular body having a plurality of ports one of which is out of line with another, and a valve slidable longitudinally on said body, said valve having a port in line with one of the ports of the body and out of line with another of the ports of the body.

3. A grain trier consisting of a tubular body having a plurality of ports arranged one above the other, one port being out of line with another, and a valve slidably mounted upon said body to move lengthwise thereof, said valve having a plurality of ports one above another, one of said valve ports being out of line with another of said valve ports, two of the ports in the valve being in line to register with two of the ports in the body at different points in the movement of the valve.

4. A grain trier consisting of a tubular body having a plurality of ports, some of said ports being out of line with others and in line with at least one other, and a valve slidable longitudinally on said body, said valve having a plurality of ports, one port in line with each of the ports in the body.

5. A grain trier consisting of a tubular body having a plurality of ports arranged one above the other, some of said ports being out of line with others, and there being at least two ports in each of two given lines, a valve slidable longitudinally on said body, said valve having a plurality of ports arranged one above the other, two of said valve ports being in line with one line of ports in the body and two other of said valve ports being in another line of ports in the body.

6. A grain trier consisting of a tubular body having five ports therein, one above another, two of said ports being in line with each other and the remaining three of said ports being in line with each other and out of the first mentioned line of ports, and a valve slidable lengthwise of said body, said valve having four ports, two of the valve ports being in line to register with one line of ports in the body and the remaining two valve ports being in line with the other line of ports in the body.

7. A grain trier consisting of a tubular body having two sets of ports therein, one set being in one alinement and the other set being in another alinement, a non-rotatable valve slidable lengthwise on said body, said valve having a port in alinement with each line of ports in the body, adjacent ports in the body being out of alinement with each other both longitudinally and circumferentially.

8. A grain trier consisting of a tubular body having a plurality of ports therein, one above the other, said ports being arranged in a plurality of lines, considered lengthwise of the device, adjacent ports being in different lines and a non-rotatable valve slidable longitudinally on said body, said valve having a port in alinement with one of the body ports and out of alinement with another of the body ports.

9. A grain trier consisting of a tubular body having a plurality of ports therein, the lowermost three of said ports being equidistant from each other, and there being two additional ports twice as far apart from each other and from the uppermost of the previously mentioned ports as the previously mentioned ports are from each other, and a slide valve on said body, said valve having ports adapted to register with some of the ports in the body.

10. A grain trier having a tubular body, a valve slidable along said body, and two half collars at the upper end of the device, one half collar being fastened to the body and the other to the valve, and a lid for closing the upper end of the body.

11. A grain trier composed of a tubular body, closed at the lower end, a valve slidable along said body, and a collar at the upper end of the device, part of said collar being fastened to the body and part to the valve, part of the collar being hollowed out whereby it may be readily grasped by the fingers of the user.

In witness whereof, I have hereunto subscribed my name in the presence of two witnesses.

EDWARD J. WAREHAM.

Witnesses:
CHAS. L. EDELL,
HOWARD M. COX.

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