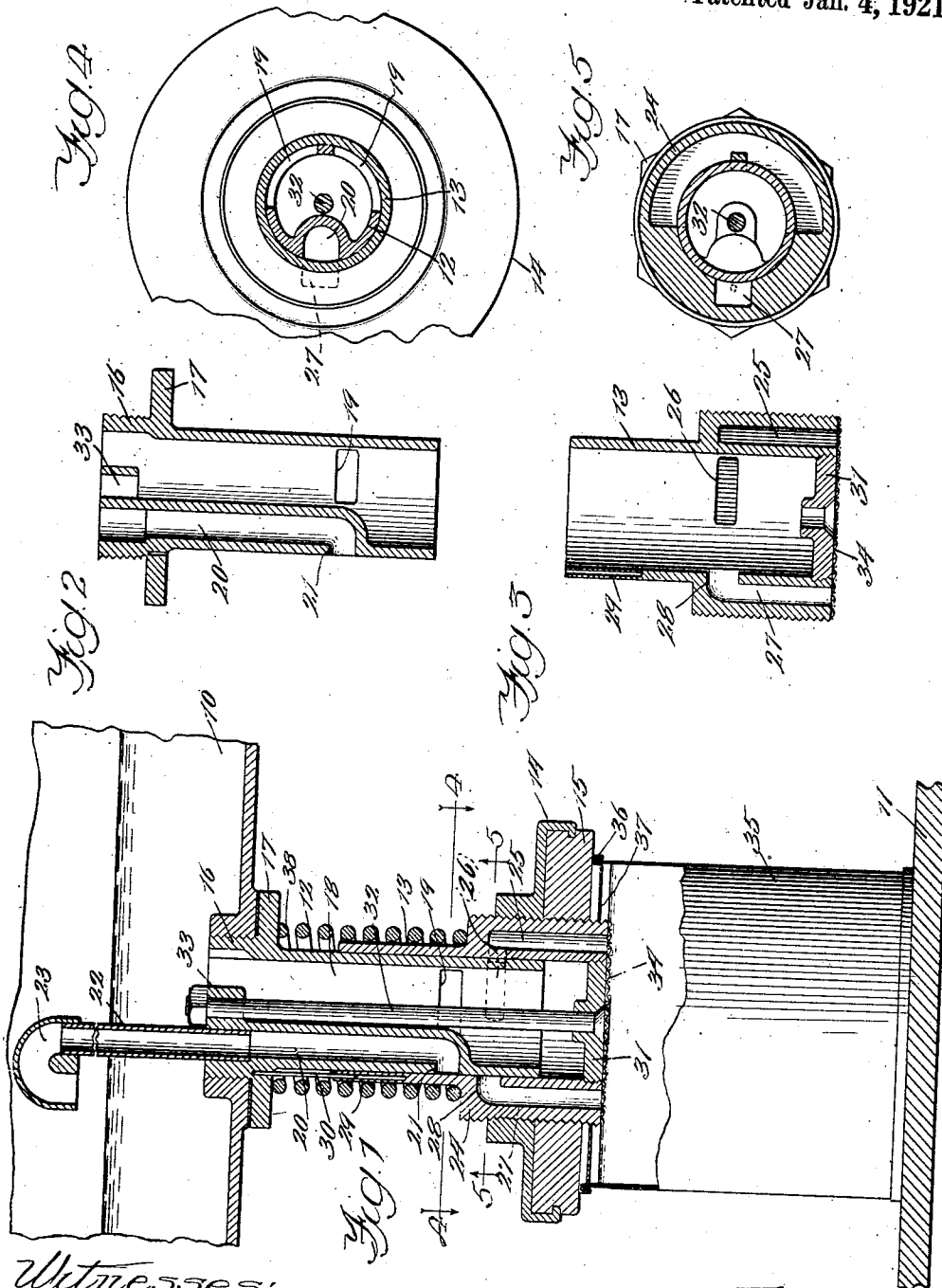


C. E. STEERE.
FILLING MACHINE.
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1,364,650.

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Witnesses:
W. B. Barrett
John D. Perry

Inventor
Clarence E. Steere
By *James W. Aldington, Atty.*

UNITED STATES PATENT OFFICE.

CLARENCE E. STEERE, OF CHICAGO, ILLINOIS, ASSIGNOR TO SPRAGUE CANNING MACHINERY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

FILLING-MACHINE.

1,364,650.

Specification of Letters Patent.

Patented Jan. 4, 1921.

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To all whom it may concern:

Be it known that I, CLARENCE E. STEERE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Filling-Machines, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing forming a part of this specification.

My invention relates to filling machines, and more specifically to the valve mechanism for controlling the amount of liquid which is placed in a can or other suitable receptacle.

One of the objects of my invention is to provide improved mechanism of the character indicated which will be simple in construction and efficient in operation and which will prevent injury to the material in the receptacle, and in which the mechanism will not easily become clogged.

Further objects will appear from the detailed description to follow taken in connection with the appended claims.

In the drawings, in which I have shown one embodiment of my invention—

Figure 1 is a vertical sectional view through the bottom of the reservoir and the axis of the filling valve;

Fig. 2 is an axial section of the fixed sleeve;

Fig. 3 is an axial section of the sliding sleeve;

Fig. 4 is a section on the line 4—4 of Fig. 1; and

Fig. 5 is a section on the line 5—5 of Fig. 1.

Referring now to the drawings in detail, I have shown my invention in connection with a filling machine comprising a reservoir 10 which is supplied in any suitable manner with the liquid which is to be placed in the cans or receptacles, and a vertically movable support 11 on which the cans or receptacles are placed, and by means of which they are moved upward into contact with the seal of the filling valve. The mechanism for controlling the flow of liquid into the reservoir comprises a fixed sleeve 12 which is secured to the reservoir 10, a sliding sleeve 13 telescopically mounted on the fixed sleeve 12, a pad or seal holder 14 secured to the sliding sleeve 13, and a pad or seal 15 for engagement with the upper edge of the receptacle

to prevent the escape of air except through the air vent provided for this purpose. The fixed sleeve 12 comprises a threaded portion 16 which is screwed into the bottom of the reservoir 10, a flange portion 17 for engagement with the bottom of the reservoir, a liquid passage 18 in communication with the reservoir, a liquid port 19 for the passage 18, an air passage 20 forming part of the air vent means, and an air port 21 for the air passage 20. The air passage 20 is in communication with the atmosphere through a vent tube 22 which is inserted in the upper end of the passage 20 and extends up above the level of the liquid in the reservoir 10. The upper end of the vent tube 22 is provided with a U-shaped vent cap 23 to prevent any liquid which may be forced up through the vent tube 22 from spurting directly upward. The sliding sleeve 13 comprises an enlarged threaded portion 24 on which the seal holder 14 is threaded, a liquid passage 25 for delivering the liquid to a receptacle, a liquid port 26 movable into and out of registration with the port 19 to connect the passages 18 and 25, an air passage 27 forming part of the air vent means leading from the receptacle, and an air port 28 for the passage 27 movable into and out of registration with the port 21 to connect and disconnect the passages 27 and 20.

In order to prevent relative rotation between the sleeves 12 and 13 the sleeve 13 is drilled out as shown at 29 to receive a pin 30 which is secured in the flange 17 of the sleeve 12. The lower end of the sliding sleeve 13 is closed by means of a head or cap 31 which is screwed into the sleeve, and the sliding sleeve is prevented from slipping off of the fixed sleeve by means of a bolt 32 threaded into the head 31 and having a sliding engagement with an opening 33 in the fixed sleeve 12. A screen 34 is provided at the lower end of the sliding sleeve to prevent the material in the receptacle from entering the passages 25 and 27. During the filling operation the upper edge 36 of the can or receptacle 35 engages the pad 15 to prevent the escape of air from the can except through the passage 27. The can is provided with an opening 37 in its top to receive the lower end of the sliding sleeve. The sliding sleeve is normally held in its lowermost position by means of a coil spring 38 surrounding the sleeves.

The operation of my improved device is as follows: The reservoir 10 is kept supplied with the liquid (which may be water, brine, syrup or any liquid or semi-liquid substance which will flow freely by gravity) in any suitable manner and is maintained at a substantially constant level. The cans or receptacles 35 are placed in position on the support 11 in any suitable manner so that the edge 36 of the can will be in position beneath the seal 15, and so that the opening 37 will be in position to permit the lower end of the sliding sleeve to enter the can. The support 11 is then raised in any suitable manner to bring the edge 36 in contact with the seal 15 and to raise the sliding sleeve 13. As the sleeve 13 is raised the ports 21 and 28 will first come into registration thus placing the interior of the can 35 in communication with the atmosphere through the passages 27 and 20 and the vent tube 22. Further upward movement of the sliding sleeve 13 will bring the ports 26 and 19 into registration to permit the liquid to flow into the can 35 from the reservoir 10 through the passages 18 and 25. As the liquid rises in the can 35 the air in the upper part of the can is forced out through the passages 27 and 20. When, however, the liquid in the can reaches the bottom of the sliding sleeve 13 the air in the upper part of the can above the liquid is cut off from the air vent by the liquid itself, so that no more air can escape and the liquid cannot, therefore, rise any higher in the can except the slight distance which the compressibility of the air will permit it to rise. The liquid will, however, rise in the passages 27 and 20 and in the vent tube 22 until it is substantially the same height as the liquid in the reservoir 10. After sufficient time has elapsed to permit the can to be properly filled the support 11 is lowered to permit the spring 38 to force the sliding sleeve downward. As the sleeve 13 moves downward the ports 26 and 19 will first be moved out of registration to cut off the supply from the reservoir 10. Further downward movement of the sleeve 13 will cause the ports 21 and 28 to cease to register. Further downward movement of the can will cause the edge 36 to move away from the seal 15. This will permit the small amount of liquid which is in the passages 25 and 27 to flow down into the can. This amount is so small, however, that it can be disregarded in the practical operation of the machine, and moreover, as it is a definite amount it can be taken care of in the design and adjustment of the machine.

During the operation of the machine the filled can is removed and a can which is to be filled or finished off is put in its place and the filling operation repeated. It will be noted that when the ports 21 and 28 cease

to register the passage 20 and vent tube 22 will be left with some of the liquid in them. The greater portion of this liquid, however, will flow down into the can 35 as the sleeve 13 is moved upward as the ports 21 and 28 register before the ports 19 and 26 register. Whatever liquid may remain in the passage 20 and vent tube 22 at the time the ports 19 and 26 begin to register will be forced up through the vent tube 22 and out through the vent cap 23 by the air which is forced out of the upper part of the can by the flow of liquid into the can through the passages 18 and 25. The cap 23 will prevent this liquid from spurting straight up and will direct it down into the reservoir. The screen 34 will prevent any solid material, such as peas, or other vegetables or fruits, which may be in the can from entering the passages 25 and 27 and clogging up the valve mechanism.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:—

1. The combination with a liquid reservoir, of a cylindrical member extending therefrom provided with a passage in communication with said reservoir, said passage having a port in the side of said cylindrical member, said cylindrical member being also provided with a second passage in communication with the atmosphere, said second passage also having a port in the side of said cylindrical member, and a sleeve member slidable on said cylindrical member provided with two passages each having a port movable into and out of registration with the ports on the cylindrical member, respectively, the lower face of said sleeve member being substantially flat and the passages in said sleeve member leading to said flat face.

2. The combination with a liquid reservoir, of a cylindrical member extending therefrom provided with a passage in communication with said reservoir, said passage having a port in the side of said cylindrical member, said cylindrical member being also provided with a second passage in communication with the atmosphere, said second passage also having a port in the side of said cylindrical member, a sleeve member slidable on said cylindrical member provided with two passages each having a port movable into and out of registration with the ports on the cylindrical member, respectively, the lower face of said sleeve member being substantially flat and the passages in said sleeve member leading to said flat face, and a screen extending across said flat face.

3. The combination with a liquid reservoir of a liquid-conducting member extending therefrom provided with a passage in communication with said reservoir, said passage having a port in the side of said mem-

ber, a sleeve member slidable longitudinally on said conducting member and provided with a passage having a port movable into and out of registration with the port on
 5 said liquid-conducting member, said sleeve and second passage extending beyond the end of said liquid-conducting member and means for the escape of air from the container to be filled.

10 4. The combination with a liquid reservoir of a liquid-conducting member extending therefrom provided with a passage in communication with said reservoir, said passage having a port in the side of said member, a sleeve member slidable on said conducting member and provided with a passage having a port movable into and out of
 15 registration with the port on said liquid-conducting member, said sleeve and second passage extending beyond the end of said liquid-conducting member, a sealing member secured to said sleeve having a sealing portion for engagement with the edge of a container and means for the escape of air
 20 from the container to be filled.

5. The combination with a liquid reservoir of a member extending therefrom having a passage for the flow of liquid from said reservoir, and a passage for the flow of
 30 air to said reservoir, said member having a port in its side in communication with the liquid-passage, and another port in its side in communication with the air-passage, and

a sleeve member slidable on said first member and provided with two ports movable
 35 into and out of registration with respect to said first two ports, respectively, and two passages in said sleeve member in communication with the ports in the sleeve member, respectively, said sleeve member and the
 40 passages therein extending beyond the end of said first member.

6 The combination with a liquid reservoir of a member extending therefrom having a passage for the flow of liquid from said reservoir, and a passage for the flow of air to said
 45 reservoir, said member having a port in its side in communication with the liquid-passage, and another port in its side in communication with the air-passage, a sleeve member slidable on said first member and provided with two ports movable into and
 50 out of registration with respect to said first two ports, respectively, two passages in said sleeve member in communication with the
 55 ports in the sleeve member, respectively, said sleeve member and the passages therein extending beyond the end of said first member, and a sealing member secured to said sleeve member and provided with a sealing
 60 portion for engagement with the edge of a container.

In witness whereof, I have hereunto subscribed my name.

CLARENCE E. STEERE.