

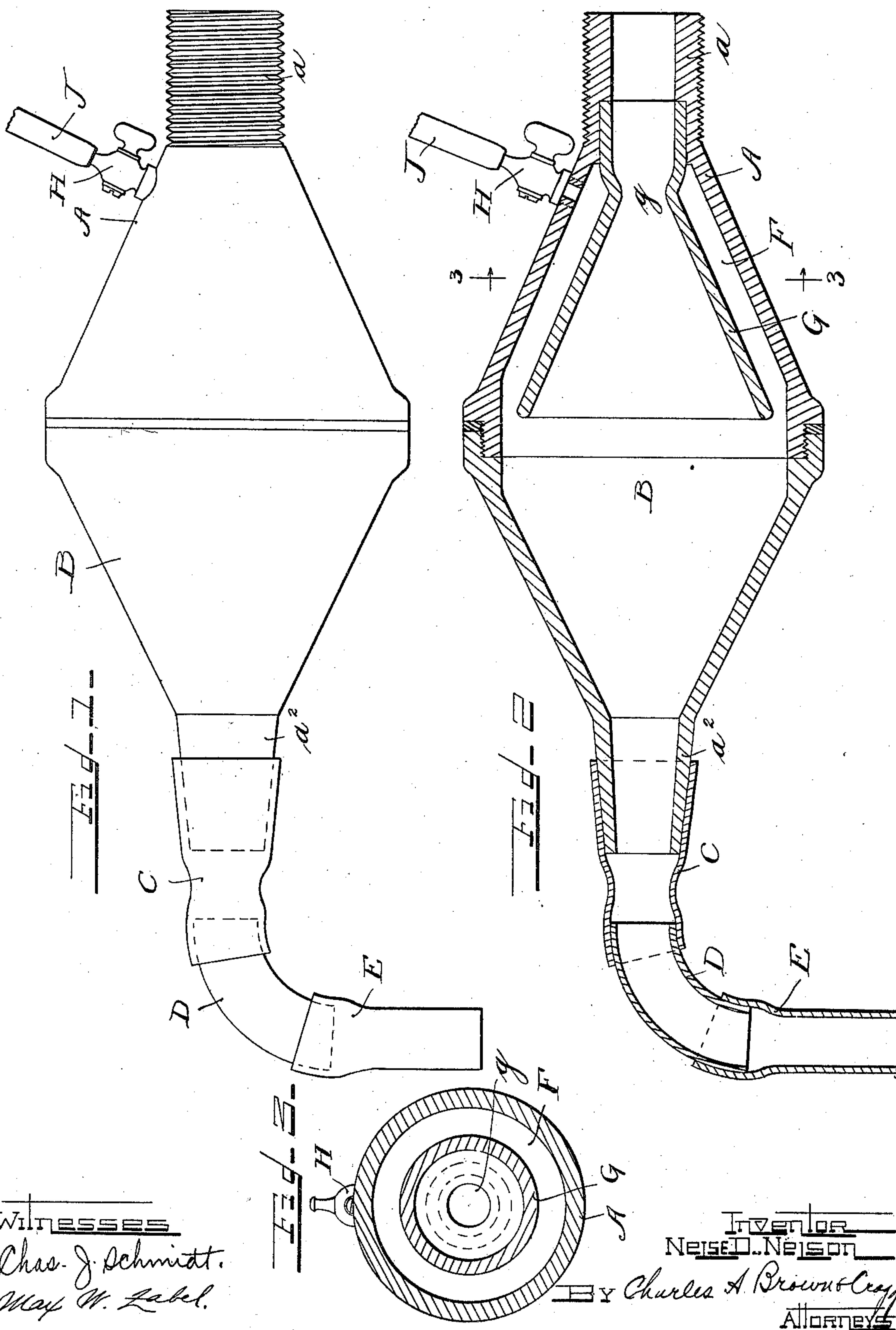
No. 704,565.

Patented July 15, 1902.

N. D. NELSON.
RECEPTACLE FILLING DEVICE.

(Application filed Apr. 7, 1900.)

(No Model.)



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UNITED STATES PATENT OFFICE.

NELSE D. NELSON, OF ANN ARBOR, MICHIGAN.

RECEPTACLE-FILLING DEVICE.

SPECIFICATION forming part of Letters Patent No. 704,565, dated July 15, 1902.

Application filed April 7, 1900. Serial No. 11,971. (No model.)

To all whom it may concern:

Be it known that I, NELSE D. NELSON, a citizen of the United States, residing at Ann Arbor, in the county of Washtenaw and State of Michigan, have invented a certain new and useful Improvement in Receptacle-Filling Devices, (Case No. 2,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to devices by which receptacles such as bottles can be filled in succession from a tank or reservoir or other apparatus containing fluid for a large number of receptacles. In such cases it is well known that the running of the fluid out of the large apparatus produces considerable foam in the small receptacles which are filled from it. Where these small receptacles are bottles, it is very undesirable to have foam at the top of them. It necessitates, generally, having to wait until the foam settles and then having to fill the space occupied by the foam. This in reality necessitates filling the bottles twice.

The object of my invention is to provide a device by which receptacles, especially bottles, can be filled without the accumulation of any foam.

To the attainment of this and other desirable ends my invention consists in matters hereinafter set forth.

In the accompanying drawings, Figure 1 is an elevation of a filling device embodying my invention. Fig. 2 is a longitudinal section of the same. Fig. 3 is a transverse section taken on line 3 3 in Fig. 2.

The device illustrated in the drawings involves a hollow or tubular casing A, which provides a chamber or passage B, through which the fluid flows in passing from the large receptacle to the small ones which are to be filled. This casing A is to be attached to the tank or source of fluid-supply and to such end has one of its ends a screw-threaded. The opposite end of the casing is provided with a suitable orifice a^2 . This orifice a^2 could itself be employed for directing the current into the small receptacles; but as a preferred arrangement it is provided with a flexible tube C, and the latter has attached to it a metallic tube D, carrying a flexible nipple E. In this way the device is provided

with a flexible end, which can be applied for various kinds of receptacles. The flexible nipple E can also be used as a means of starting and stopping the flow of the liquid by squeezing it with the fingers. In accordance with my invention the casing A is provided with a vacuum-chamber F, which communicates with the chamber B, provided by the casing. As a simple arrangement this chamber F is formed by a tubular structure or partition G, whose inner end is secured to the threaded end a of the casing. By such arrangement the liquid passing through the chamber B tends to draw the liquid confined in the vacuum-chamber F out of such chamber, and thereby create a vacuum therein. This vacuum extracts from the liquid the air which would otherwise accumulate and produce foam upon the liquid. As a result the liquid flowing through the device will have the air extracted from it and when it emerges from the device will be absolutely free from foam. The air extracted from the liquid can, if desired, be withdrawn from the vacuum-chamber by a stop-cock or valve H, secured to the casing A so as to communicate with the vacuum-chamber F. This stop-cock can be connected, as by a flexible tube J, with a suitable air-pump or similar apparatus, which can be assumed to be present.

When a number of small receptacles, such as bottles, are being filled, a small period of time will intervene between the flow of liquid for each one. I have found by experience that bottles can be filled by the device one after another without the use of an air-pump or similar device for withdrawing the air from the chamber F. In all probability the air returns to the tank or apparatus containing the liquid in the first instance and rises to the top of the same.

In using the apparatus it will be understood that the casing B and attached tubes are filled with the liquid and all of the air extracted, as by the stop-cock H, before beginning the filling operation. After this is done the small receptacles can be filled one after another by merely allowing the liquid to flow and stopping that flow at proper intervals. Where small receptacles are filled with a small period of time intervening between the filling of each, the air extracted

from the foam will, as I have said, find its way out of the device. Where the filling is continuous, so that the flow through the casing A is continuous, the extracted air can be

5 withdrawn by the air-pump.

Inasmuch as the escape of the liquid through the orifice a^2 or through the flexible nipple E might in itself produce foam upon the liquid, the tubular structure G is constructed with

10 a neck g , which is contracted to such an extent that it is smaller than any one of the openings through which the liquid subsequently passes. This structure G is preferably made in a conical or flaring shape, so

15 that the flow of liquid through it is comparatively slow. The casing A is also desirably made in a conical shape. It is also conveniently made in two longitudinal portions, which are normally secured tightly together,

20 but can be easily separated, as by unscrewing them, so that the interior of the device can be readily cleaned or repaired.

It will be seen that the vacuum-chamber F is to all intents and purposes a chamber

25 closed except where it communicates with the passage B—that is to say, it has no other passages admitting air or liquid. It is in this way that the vacuum produced is effective in sucking or drawing the air backwardly

30 and out of the liquid passing through the device. It will also be seen that the air-pump connected with the tube J draws air out of the vacuum-chamber F, this outflow of air being in contradistinction to an inflow through

35 the pipe or tube J.

From the foregoing it will be seen that my invention comprises a simple, practical, and effective device for filling receptacles with liquid without the production of any foam.

What I claim in my invention is—

1. A device for filling receptacles comprising a bulb or casing having an inlet and an outlet, and a flaring tubular structure having its smaller end secured to the inlet end of the casing and forming a continuation of the inlet

45 of the casing, such tubular structure being extended into the chamber formed by the casing and terminating between the ends thereof so as to form between itself and the casing, a vacuum-chamber communicating with the interior of the latter.

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2. The combination with a receptacle-filling device having a passage for the liquid, and also having a vacuum-chamber communicating with said passage, of means for producing

55 a vacuum or partial vacuum, said means being connected with the receptacle-filling device so as to communicate with the vacuum-chamber thereof and arranged to draw the air out of said chamber in a direction opposite that in which the liquid passes through

60 the device.

3. A bottle-filling device comprising a tubular casing having an inlet and an outlet, and made in two separable portions, screw-threaded together, said portions being largest at their meeting-points and tapering toward their ends; and a tubular flaring structure secured within the inlet end of one of said portions, and terminating near the large end

70 of the same.

In witness whereof I hereunto subscribe my name this 2d day April, A. D. 1900.

NELSE D. NELSON.

Witnesses:

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