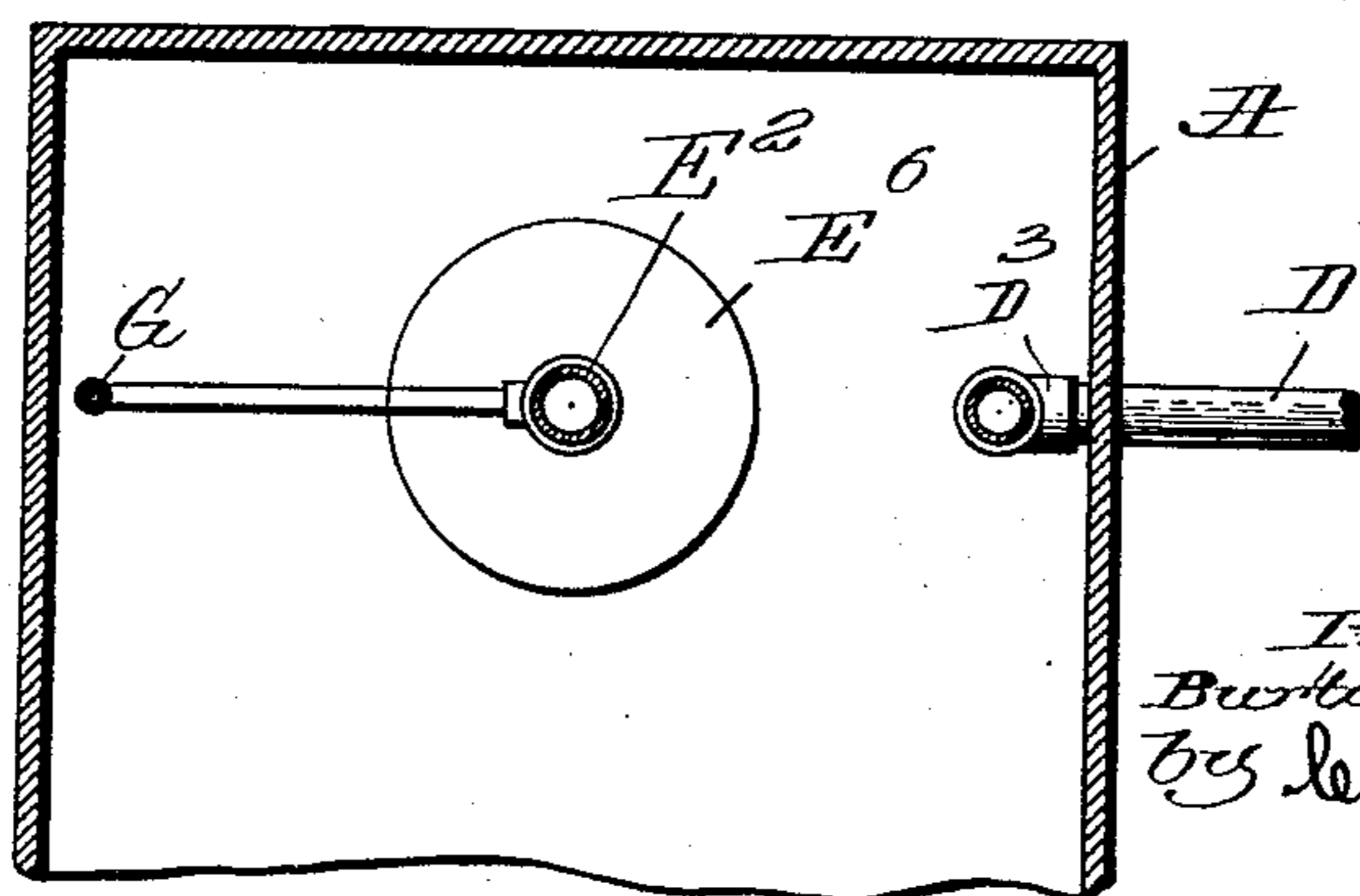


912,243.

Fig. 1.



Witnesses:  
 Rich. S. Grumbaf.  
 Joseph M. Ward.

Inverellor.  
Burton W. Hill,  
Box 124, Oregon.  
Atty

# UNITED STATES PATENT OFFICE.

BURTON W. HILL, OF SOMERVILLE, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO FRANK M. SHELDON, OF NEWTON, MASSACHUSETTS.

## VACUUM-BREAKER AND ALARM.

No. 912,243.

Specification of Letters Patent.

Patented Feb. 9, 1909.

Application filed June 9, 1908. Serial No. 437,523.

*To all whom it may concern:*

Be it known that I, BURTON W. HILL, a citizen of the United States, residing at Somerville, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Vacuum-Breakers and Alarms, of which the following description, in connection with the accompanying drawing, is a specification, like letters on the drawing representing like parts.

This invention relates to a device for use in the drawing off from the bottom of the contents of a vat or other receptacle wherein it is desired to retain the upper portion or top layers of the contents in the tank. Such devices are of special value in connection with rendering tanks where it is desired to draw off the thin liquids from the bottom and leave the heavy or fatty liquids which are on the top in the tank. In such devices it is desirable to have the action of the means, usually a pump, for drawing off the liquid cease when the desired amount of liquid has been drawn off; or in other words, when the upper layers have reached a certain definite position in their downward movement in the tank. It is also desired that just before the action of the drawing off means ceases notice may be given of that fact.

The present invention provides a means by which the vacuum necessary in the pipe for drawing off the contents will be broken automatically when the contents have reached a predetermined level, and just prior to the breaking of the vacuum an alarm will be sounded.

The device is adjustable so as to be set at any height or level, is simple in its construction and not liable to get out of order.

The invention will more fully appear from the accompanying description and drawings and will be particularly pointed out in the claims.

The drawings represent the device in its preferred form as applied to a tank such as is used in rendering plants.

In the drawings, Figure 1 is a view in vertical cross-section of the rendering tank with the apparatus of this invention in position. Fig. 2 is a view of the portion of the tank shown in Fig. 1, in cross-section, taken on the line  $x-x$ .

The device is useful for many purposes and under many conditions, but it is herein shown as applied to that form of a receptacle

A used in connection with a rendering tank in establishments where rendering is carried on. These vats or tanks contain thick layers of fatty liquid B floating upon the top of a large quantity of liquid C. It is necessary to remove the liquid C and retain in the tanks the fatty portions B.

In order to remove the liquid C a pipe D enters the wall of the receptacle A and preferably has a downwardly extending portion  $D^2$ , which in the form shown is produced by the use of a joint  $D^3$ . A pump is connected to the pipe D and by means of the pump suction is produced therein and the contents of the tank are gradually drawn off. It is obvious that as the level of the liquid in the tank descends the fatty portions B will be drawn off unless the action of the pump in the pipe D is stopped. A second pipe E is connected to the suction pipe D and extends upwardly in general inverted U-shape. In order to secure an adjustment of its open end it is made in two main sections, the section  $E^2$  sliding vertically on the downturned end  $E^3$  of the other section. A suitable stuffing-box  $E^4$  is provided and a set-screw  $E^5$  for locking the sections in adjusted position. The lower end of the section  $E^2$  is made bell-shaped or flaring, as shown at  $E^6$ , so that when the level of the liquid passes below the end even a slight distance, a very considerable area will be opened for the admission of air into the pipe. A valve F is provided by means of which the second pipe E may be closed so that all the contents in the receptacle may be pumped off if desired. A third pipe G is connected to the section  $E^2$  of the pipe E close to the wide mouth  $E^6$ , and this pipe extends upwardly to a suitable position and is provided at its end with a suitable alarm, herein shown as a whistle.

The operation of the device will now be apparent. The pipe section  $E^2$  is adjusted on the section  $E^3$  until the edge of the flaring open mouth  $E^6$  is at the height to which it is desired the upper surface of the contents of the vat should be lowered. The valve F is left open. Suction is then applied by means of the pump or other device to the pipe D and the lower portion of the contents in the receptacle is steadily drawn off and the level of the contents gradually falls. When the upper surface of the level of the contents passes the lower edge of the flaring mouth  $E^6$  air at once enters in a considerable quantity

into the pipe E, breaking the vacuum and the action of the pump ceases. But before the vacuum breaks and before the contents have reached the predetermined level an  
 5 alarm is sounded. Because when the surface of the contents passes below the end of the pipe G air will be drawn in through the pipe G by suction in the pipes D and E and the whistle or other alarm will be sounded. The  
 10 amount of air required to operate this alarm is comparatively small and hence the vacuum in the pump or drawing off means is not broken.

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

1. A device of the character described for drawing off the contents of a receptacle from the bottom thereof, comprising a suction  
 20 pipe through which to draw off said contents extending into the receptacle at the bottom thereof, a second pipe connected to the suction pipe and having its open mouth in the receptacle at the level down to which  
 25 the surface of the contents is to be lowered, a third pipe connected to the second pipe near its open mouth, and an alarm device connected to said third pipe and operated by the occurrence of suction therein result-  
 30 ing from the exposure of the end of said third pipe when the surface of the contents is lowered past it in the second pipe.

2. A device of the character described for drawing off the contents of a receptacle  
 35 from the bottom thereof, comprising a suction pipe through which to draw off said contents extending into the receptacle at the bottom thereof, a second pipe connected to the suction pipe and having its open mouth  
 40 in the receptacle at the level down to which the surface of the contents is to be lowered, means whereby the open end of the second pipe may be adjusted with respect to the bottom of the receptacle, a third pipe con-  
 45 nected to the second pipe near its open mouth, and an alarm device connected to said third pipe and operated by the occurrence of suction therein resulting from the exposure of the end of said third pipe when  
 50 the surface of the contents is lowered past it in the second pipe.

3. A device of the character described for drawing off the contents of a receptacle from the bottom thereof, comprising a suc-  
 55 tion pipe through which to draw off said contents extending into the receptacle at the bottom thereof, a second pipe connected to the suction pipe and provided with a

flaring open mouth, the said mouth being located in the receptacle at the level down  
 60 to which the surface of the contents is to be lowered, a third pipe connected to the second pipe near its open mouth, and an alarm device connected to said third pipe  
 65 and operated by the occurrence of suction therein resulting from the exposure of the end of said third pipe when the surface of the contents is lowered past it in the second pipe.

4. A device of the character described for  
 70 drawing off the contents of a receptacle from the bottom thereof, comprising a suction pipe through which to draw off said contents extending into the receptacle at the bottom  
 75 thereof, a second pipe connected to the suction pipe and having its open mouth in the receptacle at the level down to which the surface of the contents is to be lowered, a valve in said second pipe, a third pipe con-  
 80 nected to the second pipe near its open mouth, and an alarm device connected to said third pipe and operated by the occurrence of suction therein resulting from the exposure of the end of said third pipe when  
 85 the surface of the contents is lowered past it in the second pipe.

5. A device of the character described for drawing off the contents of a receptacle from the bottom thereof, comprising a suc-  
 90 tion pipe through which to draw off said contents extending into the receptacle at the bottom thereof, a second pipe connected to the suction pipe and having its open mouth in the receptacle at the level down  
 95 to which the surface of the contents is to be lowered.

6. A device of the character described for drawing off the contents of a receptacle from the bottom thereof, comprising a suc-  
 100 tion pipe through which to draw off said contents extending into the receptacle at the bottom thereof, a second pipe connected to the suction pipe and having its open mouth in the receptacle at the level down to which  
 105 the surface of the contents is to be lowered, means whereby the open end of the second pipe may be adjusted with respect to the bottom of the receptacle.

In testimony whereof, I have signed my name to this specification, in the presence of  
 110 two subscribing witnesses.

BURTON W. HILL.

Witnesses:

MABEL PARTELOW,  
 THOMAS J. DRUMMOND.