Nov. 17, 1925. 1,562,380

W. STEIN

CHLORINE GAS CONTROL FOR FLOUR BLEACHING

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Fig. 1.

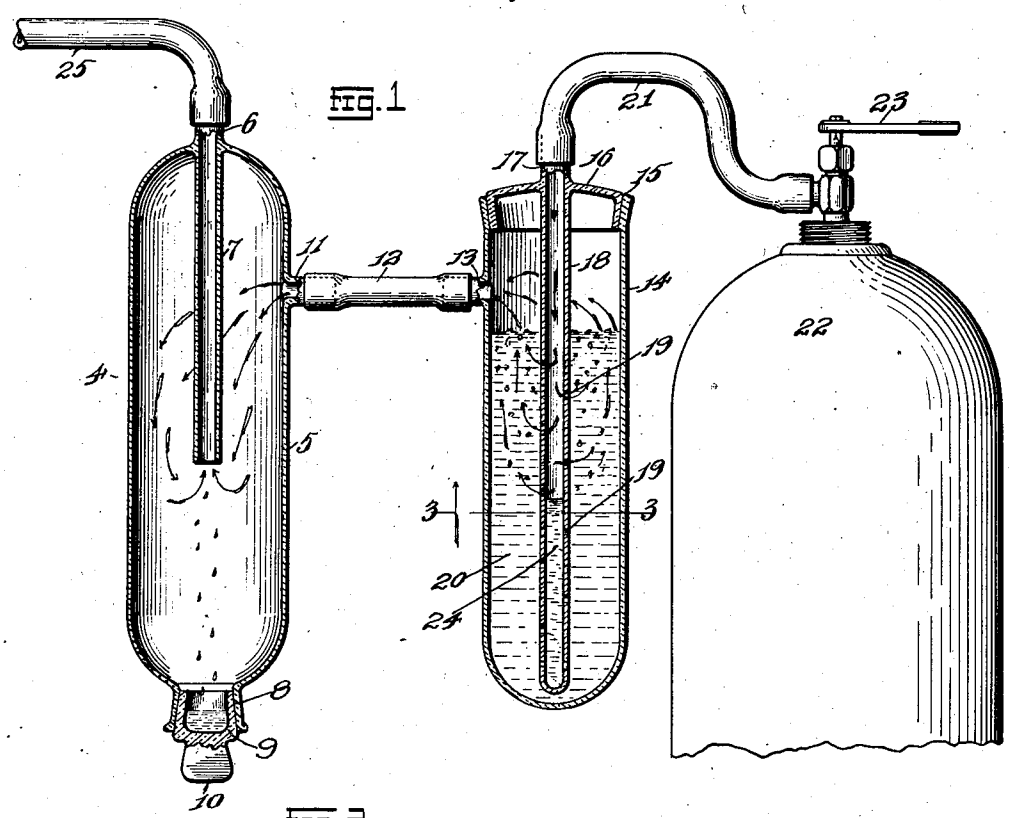


Fig. 2.

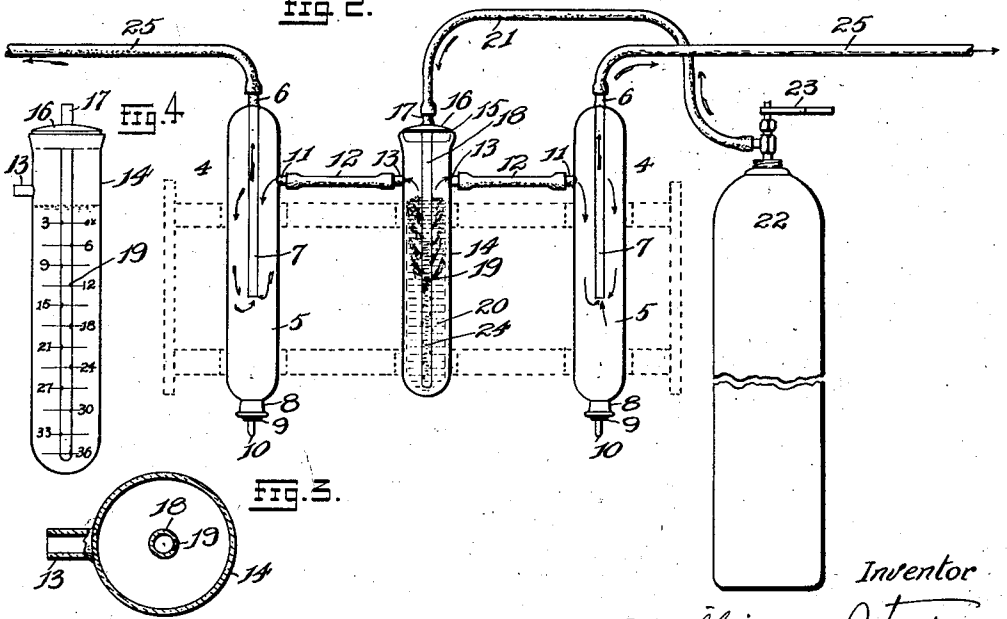


Fig. 4.

Fig. 3.

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UNITED STATES PATENT OFFICE.

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CHLORINE-GAS CONTROL FOR FLOUR BLEACHING.

Application filed September 22, 1924. Serial No. 739,237.

To all whom it may concern:

Be it known that I, WILLIAM STEIN, a citizen of the United States, residing at St. Louis, State of Missouri, have invented a certain new and useful Improvement in a Chlorine-Gas Control for Flour Bleaching, of which the following is a specification.

This invention relates to improvements in a chlorine gas control for flour bleaching, and has for its object an arrangement of transparent containers arranged and suitably connected through which the chlorine gas is directed, thoroughly filtered and all particles of moisture extracted before the gas is admitted into the agitator or flour tumbling container.

Another object of my invention is to construct a perfectly sealed indicator containing a given body of water through which the chlorine gas is directed, this gas is then directed to a separator member likewise perfectly sealed, in this separator member any particles of moisture carried by the gas are separated and permitted to lodge in the bottom, from which said condensation may be conveniently drained.

By my improved means, the correct amount of gas to be used can be readily observed, and the separating element removes all particles of moisture, thus delivering into the agitator a perfect dry bleaching gas.

Figure 1, is a sectional view of my invention showing the gas supply tank in elevation.

Figure 2, is a side elevation of my system for duplicate use.

Figure 3, is a horizontal sectional view of the indicator taken on the line 3—3 of Figure 1, and Figure 4, is a front elevation of the indicator showing the graduations formed on the outer surface.

In the general arrangement of my invention, I provide a separator member, 4, consisting preferably of a suitable elongated tubular body 5, preferably of a strong quality of glass, the upper closure or closed end terminating in an integral nipple 6, and a downwardly extending integral open bottom tube 7, this tube extending in the tubular body 5 slightly below midway of its length or lower if desired, this tube being formed integral prevents joints and any possible leakage or gas escape.

The bottom end of the body 5, terminates in a stopper opening 8, the inner surface thereof being suitably ground for the reception of a similarly ground hollow stopper 9, equipped with a finger piece, 10, for manipulation. This stopper is so constructed as to make a perfectly tight and leakproof connection when inserted in the mouth or opening, 8, and by this means, any and all condensation removed from the traveling gas is collected and removed when found convenient and necessary.

On one side of the filter is also formed an integral nipple, 11, over which is placed a tube, 12, of any durable material, the opposite end of this tube is connected to a nipple 13, formed integral with the indicator, consisting of a tubular body member, 14, of transparent material, its bottom being closed and its upper end open as indicated by the numeral 15, the inner surface of said opening is suitably ground for the reception of the closure, cap or stopper, 16, whose contacting surface is correspondingly ground for effecting a tight and leakproof connection.

This element, 16, is provided with an integral nipple, 17, and an integral downwardly extending tube, 18, its lower end closed and the side walls provided at suitable intervals with perforations, 19, through which the gas is permitted to be directed through the body of water or liquid, 20, and then pass out through the nipple, 13, into the separating member.

On the nipple, 17, is attached a tube, 21, leading to the chlorine gas supply tank or container, 22, and from which the gas is admitted and its pressure regulated by the manipulation of the tank valve, 23.

By means of the indicator, 14, the operator can readily observe the amount of gas admitted, this is indicated by the downward movement of the body of water, 24, in the tube, 18, and the number of perforations, 19, through which the gas percolates into the body of water in the indicator outside of the tube. The water level in the indicator is always above the uppermost perforations, 19, in the tube, 18, so that all gas must pass through the water before entering the separating member.

From the separating member the gas is directed by a tube, 25, attached to the nipple, 6, to the necessary agitator or flour tumbling machine not illustrated in the drawing.

Referring to Figure 2, I show a side elevation of my system, but in this instance I

show the indicator with two nipples, 13, located on opposite sides, by this arrangement I may use and connect up to the indicator two separating members and direct the gas to two agitators from the same supply, and if found desirable, I may equip the indicator with any number of outlets for supplying a plurality of agitators, and the dotted lines shown in Figure 2 merely represent a frame by which the tubes are supported in position.

Since I am a practical miller, and now in charge of the operation of a very large flour mill, I have operated a number of bleaching devices, but none have been as successful as the structure shown for the reason that all of the apparatus and appliances are equipped with valves which soon become eaten up by the gas, thus there is an escape of chlorine gas which is dangerous and very unsatisfactory, again there is no visible arrangement by which the rate of gas admission can be observed.

By my arrangement, all of the elements are constructed of transparent material, no valves to become out of order, and the transparent tubes and nipples are integral with the proper section. The only two joints in the apparatus are at the stopper, 9, of the filter and the top of the indicator, and these joints are made leakproof by a ground connection.

The circulation of the gas through the apparatus is illustrated by the arrows in Figure 1, and also the circulation of the double structure by the arrows in Figure 2.

By my arrangement I deliver into the agitator, and direct against the agitated flour, a properly regulated volume of purely filtered and perfectly dry chlorine gas. And the pressure is clearly observed by the movement of the gas through the perforations and body of water.

To gauge the pressure, the operator by the movement of the valve, 23, of the tank, can observe the same by the number of holes in the tube, 18, delivering gas, when once so set the pressure remains the same.

By means of the separating member all foreign matter, and moisture is collected at the bottom, from which it can be removed at will.

On the tubular member or body of the indicator I provide graduations which are in alignment with the perforations 19 of the tube and they are arranged from 3 ounces and up, and increasing by threes, the first perforation meaning that 3 ounces of gas is being admitted, the second perforation showing that 6 ounces of gas is admitted and so on increasing by threes. This will be in clear view to the operator at all times, and the amount of gas to be admitted depends upon the capacity and quantity of flour to be bleached.

Having fully described my invention, what I claim is:

1. A chlorine gas control for flour bleaching comprising an independent transparent graduated tubular indicator having an open top and containing a volume of liquid through the the gas is directed, a detachable stopper closing said open top, a perforated tube forming a part of the stopper and extending into the indicator, an independent transparent tubular separating member through which the gas from the indicator must pass, and be purified from moisture before admitted to the agitator, said indicator and separating member connected together by a separate pliable tube.

2. A device of the class described comprising a graduated tubular indicator member provided with an inlet and an outlet, a separating member having an inlet and outlet, indicator and filter being conveniently connected together by a separate tube, the indicator having its top and gas inlet tube formed integral, the separating member having an outlet tube formed integral therewith, and a leakproof stopper formed in the bottom of the separating member.

3. A device of the character described comprising an indicator, and a separating member preferably located side by side connected together, in combination with a chlorine gas tank for supplying gas to the indicator, the indicator consisting of an outer transparent tubular body portion, with an integral nipple formed on its side to which may be attached a separate tube, and a detachable closure having an integral transparent perforated tube extending into the body portion, the separating member comprising a transparent tubular body portion its upper end closed and provided with an integral transparent tube extending downwardly into the body portion, an integral nipple formed on its side for tubular connection to the indicator, and a stopper located at its bottom having a leakproof connection.

In witness whereof I hereunto set my hand.

WILLIAM STEIN.