

(No Model.)

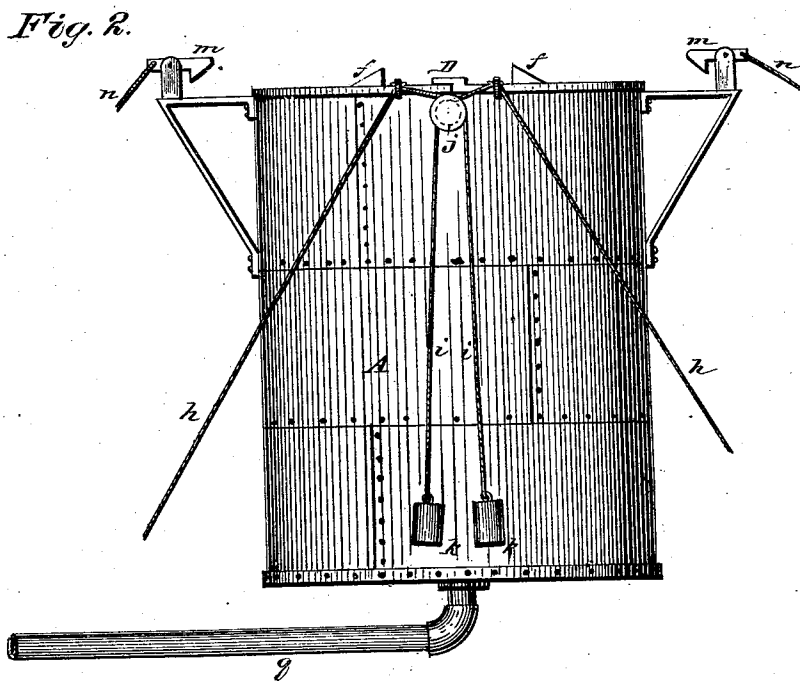
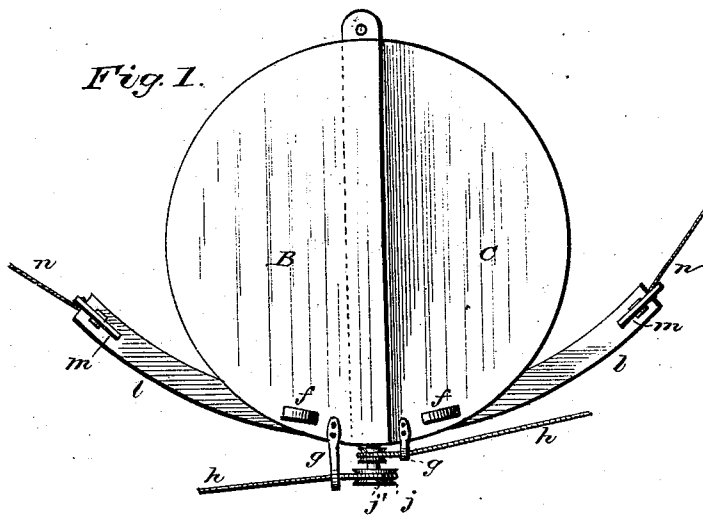
2 Sheets—Sheet 1.

J. H. CAMPBELL.

Apparatus for Extinguishing Fires in Oil Tanks.

No. 236,203.

Patented Jan. 4, 1881.



Witnesses:
Fred. G. Duterich
A. H. Krause

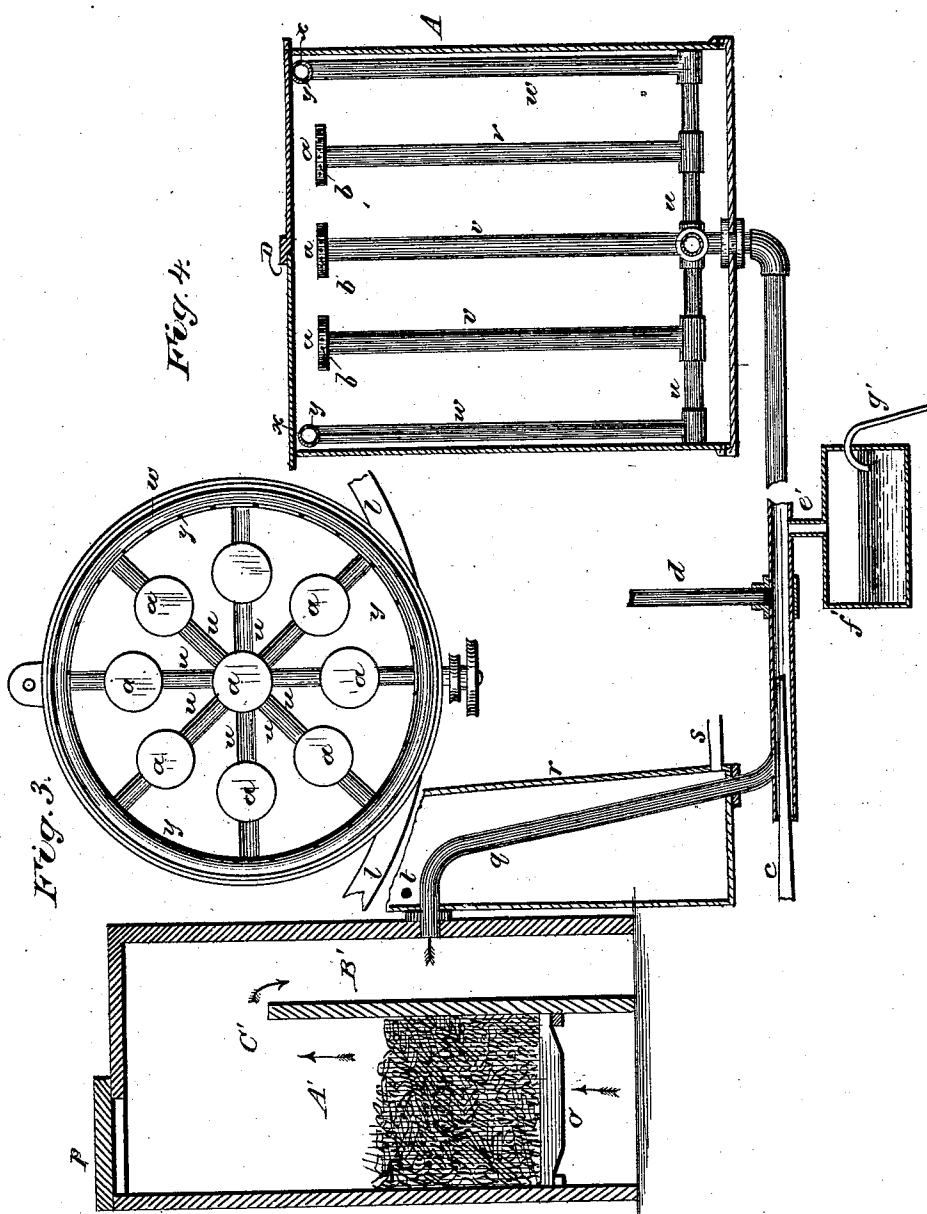
Inventor
Joseph H. Campbell
By *J. J. Johnston*
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UNITED STATES PATENT OFFICE.

JOSEPH H. CAMPBELL, OF PITTSBURG, PENNSYLVANIA.

APPARATUS FOR EXTINGUISHING FIRES IN OIL-TANKS.

SPECIFICATION forming part of Letters Patent No. 236,203, dated January 4, 1881.

Application filed October 25, 1880. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH H. CAMPBELL, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a certain new and useful Improvement in Apparatus for Extinguishing Fires in Oil-Tanks; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention relates to certain new and useful improvements in fire-extinguishers, and more particularly to improvements upon my former patent, numbered 234,531, dated November 16, 1880, whereby I am enabled to apply the process therein claimed to the extinguishing of fires in oil-tanks.

The invention consists in the combination, with means for evolving carbonic-acid gas from a mass of burning charcoal and subsequently cooling it, of novel means, substantially as hereinafter described, for distributing said gas over the surface of oil in a tank, whereby the flame of the burning will be extinguished.

It further consists in the combination, with a furnace for generating carbonic-acid gas from a mass of burning charcoal, of means for subsequently subjecting said gas directly to the action of a water-spray, for cooling it in its passage to the fire to be extinguished, and also removing said water previous to discharging the gas upon the fire to be extinguished.

It finally consists in novel means for automatically covering the tank and confining the flames therein when the oil is on fire.

To enable others skilled in the art with which my invention is most nearly connected to make and use it, I will proceed to describe its construction and operation.

In the accompanying drawings, which form part of my specification, Figure 1 is a top view of an oil-tank furnished with my improvement for manipulating the covering of said tank. Fig. 2 is a side elevation of the same. Fig. 3 is a top view of the oil-tank, representing the covering removed for the purpose of showing a top view of the device used for distributing the carbonic-acid gas over the surface of the oil in case of it being on fire. Fig. 4 is a vertical section of the oil-tank and generator for carbonic-acid gas.

In the accompanying drawings, A represents an ordinary oil-tank, such as is used for storing petroleum-oil. This tank I furnish with a covering constructed of sheet metal, and made in two parts, which overlap each other, as shown at D in Figs. 2 and 4. The two parts B C, constituting the covering of the tank A, are hinged at *e*, and are furnished with catches *f f* and projecting arms *g g*, to which are attached wire cords or chains *h h* and *i i*. The wire cords or chains *i i* pass over pulleys *j j*, the axis of which is secured to the tank A, as shown in Figs. 1, 2, and 3. On the lower end of the cords or chains *i i* are secured weights *k k*, sufficiently heavy to draw the parts B C of covering together, as shown in Figs. 1 and 2. To the sides of the tank A are secured trams, over which the parts B C of the covering move when uncovering the tank. These trams *l l* are each furnished with a latch, *m*, to the outer end of which is attached a wire cord or chain, *n*, for manipulating it. The several cords or chains hereinbefore mentioned should be of sufficient length to have their lower or outer ends about one hundred feet from the tank A, so that they could be reached without danger in case the oil in the tank should take fire.

The generator for evolving the carbonic-acid gas consists of two chambers, A' B', constructed of fire-brick, the chamber A' being furnished with a grate, *o*, and lid *p*. To the chamber B' is connected a pipe, *q*, which passes through a vessel through which flows a current of cold water for the purpose of keeping the pipe *q* cool as possible. This vessel *r* should incase about thirty feet of the pipe *q*, with the cold water flowing in at *s* and wasting at *t*. The pipe *q* passes through the bottom of the tank A and a series of radial branch pipes, *u*, attached to it, and to said pipes *u* are attached a series of vertical pipes, *v w*, the pipes *w* communicating with a circular pipe, *x*, arranged near the upper edge and on the inner wall of the tank A. The pipe *x* is furnished with a large number of small openings, *y*, for the distribution of the carbonic-acid gas over the surface of the oil. The vertical pipes *v*, at their upper ends, are furnished with a hollow disk, *a*, furnished with small openings *b* for distributing the carbonic-acid gas over the sur-

face of the oil. A steam-jet pipe, *c*, enters the pipe *q*, for causing a draft from the chamber B' of the generator, and for forcing the carbonic-acid gas through the pipe *q* and through pipes *u v w x* and disks *a*, and thereby distributing said gas over the surface of the oil in said oil-tank A. To the pipe *q* is attached a pipe, *d*, which should be arranged some distance forward of the jet-pipe *c* and be connected with a water-supply. Forward of the water-pipe *d* is attached a pipe, *e'*, which communicates with a trap, *f'*, furnished with a siphon, *g'*. This arrangement of pipe *e'*, trap *f'*, and siphon *g'* is for carrying off the water from pipe *q* used in the operation of cooling the gas in its passage through pipe *q* without wasting the gas.

The construction and arrangement of the several parts of my improvement in apparatus for generating and distributing the carbonic-acid gas over the surface of the oil in the tank A will be readily understood from the foregoing description and by reference to the accompanying drawings. I will therefore proceed to describe the operation, which is as follows:

Charcoal is placed on the grate *o* and ignited. Steam flowing through the steam-jet pipe *c* will cause a draft on chambers A' B', which will draw air up through the grate *o*, causing the charcoal to burn rapidly, thereby evolving carbonic-acid gas in great quantity, which is drawn over the partition C' into chamber B', from which it is drawn into the pipe *q*, and by the steam-jet from pipe C is forced through pipes *q* into pipes *u v w x* and disks *a*, and out through openings *y* and *b*, and thereby distributes the carbonic-acid gas over the surface of the oil in tank A. The gas in its passage through the pipe *q* is cooled by coming in contact with a water-spray formed in pipe *q* by water coming from pipe *d* with force. The water, striking against the sides of the pipe *q*, forms a thick water-spray, and the gas in its passage through this thick spray is cooled, and the water, after performing its office, flows off through pipe *e'* and trap *f'* without loss of gas.

The oil-tank being uncovered, (which is a very common thing,) if the oil in it should take fire from any cause, carbonic-acid gas is generated, cooled, and distributed over the surface of the oil in the manner and by the means hereinbefore described, and while the gas is being distributed over the surface of the oil the parties operating, by drawing the cords or chains *n*, will unship the latches *m m*, and the parts B C will be drawn together automatically by the weights, thereby covering the tank A, as shown in Figs. 1 and 2, thereby confining the flames within the tank, where they are acted upon by the many jets of carbonic-acid gas, which will extinguish them with great rapidity.

Having thus described my improvement, I do not wish to be understood as claiming, broadly, anything shown, described, or claimed in my former patent before referred to; but

What I claim as of my invention is—

1. In extinguishing burning oil in oil-tanks, the combination, with means for generating carbonic-acid gas from a mass of burning charcoal and subsequently cooling it, of the gas-conveying pipe *q* and a series of stationary radial pipes connected therewith, having a series of vertical distributing-pipes projecting upward in the oil-tank, substantially in the manner as and for the purpose herein shown and described.

2. In extinguishing burning oil in oil-tanks, the combination, with means for generating carbonic-acid gas from a mass of burning charcoal and subsequently cooling it, of the gas-conveying pipe *q* and a series of stationary radial pipes connected therewith, having a series of vertical pipes, *r*, projecting upward in the oil-tank, and provided at their upper ends with perforated distributing-disks *a*, substantially as and for the purpose herein shown and described.

3. In extinguishing burning oil in oil-tanks, the combination, with means for generating carbonic-acid gas from a mass of burning charcoal and subsequently cooling it, of a gas-conveying pipe, *q*, and a series of stationary radial pipes connected therewith, having a series of vertical pipes, *w*, projecting upward in the oil-tank, and connected at their upper ends by a circular perforated distributing-pipe, *x*, substantially as and for the purpose herein shown and described.

4. In a fire-extinguisher, the combination, with a furnace for generating carbonic-acid gas from a mass of burning charcoal, of means for subsequently subjecting said gas directly to the action of a water-spray for cooling it in its passage to the fire to be extinguished, substantially as specified.

5. In a fire-extinguisher, the combination, with a furnace for generating carbonic-acid gas from a mass of burning charcoal and a gas-conveying pipe, of means for subjecting said gas directly to the action of a water-spray, and for removing said water previous to discharging the gas upon the fire to be extinguished, substantially as specified.

6. The tank-cover consisting of the parts B C and their operating mechanism, in combination with the tank A, substantially as herein described.

JOSEPH H. CAMPBELL.

Witnesses:

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W. S. COLWELL.