(No Model.) 2 Sheets—Sheet 1.

A. BRUEGGER.

CHEMICAL FIRE ENGINE.

No. 500,189. Patented June 27, 1893.

Fig. 1.

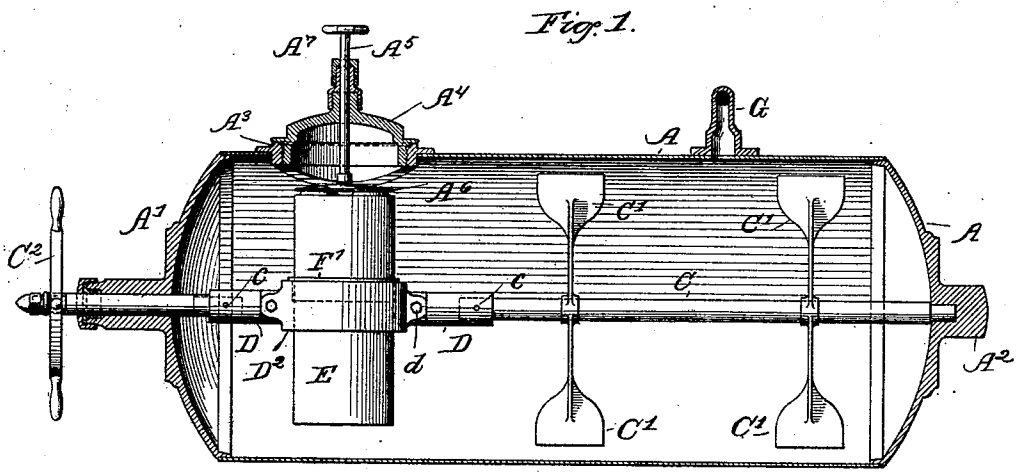


Fig. 2.

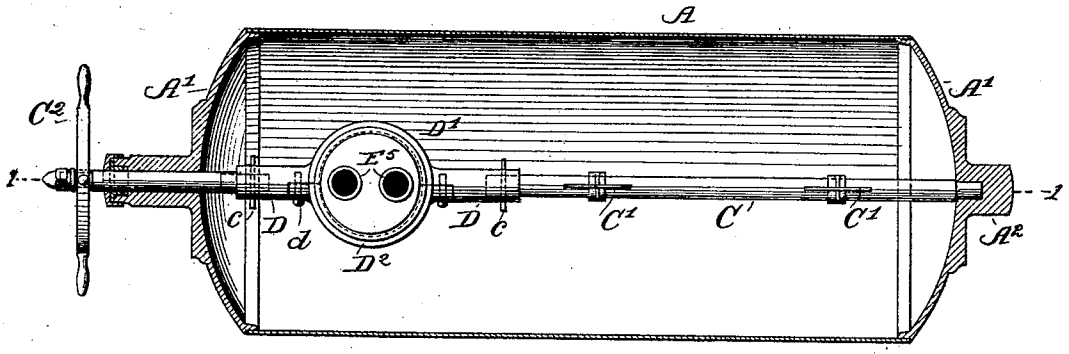


Fig. 3.

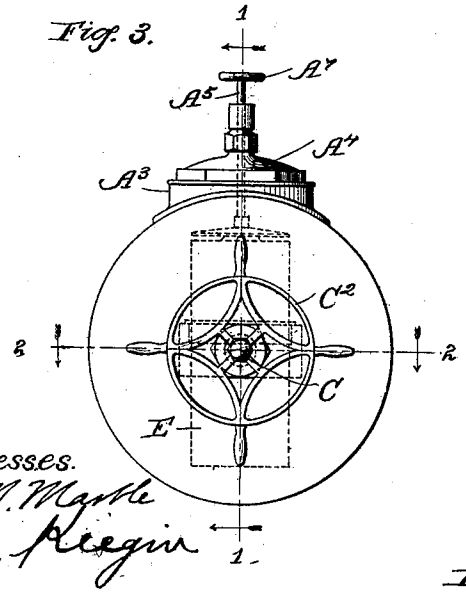
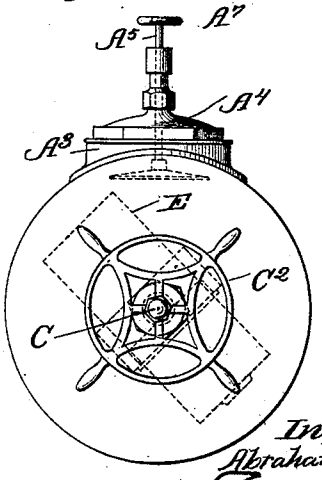


Fig 4.



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(No Model.) 2 Sheets—Sheet 2.

A. BRUEGGER.

CHEMICAL FIRE ENGINE.

No. 500,189. Patented June 27, 1893.

Fig. 5.

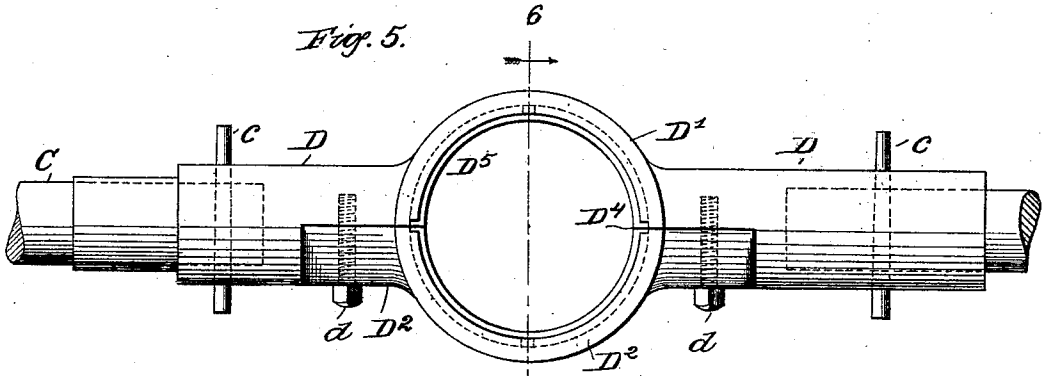


Fig. 6.

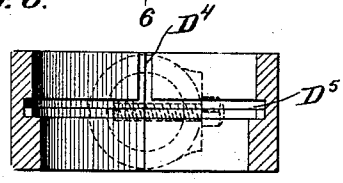


Fig. 7.

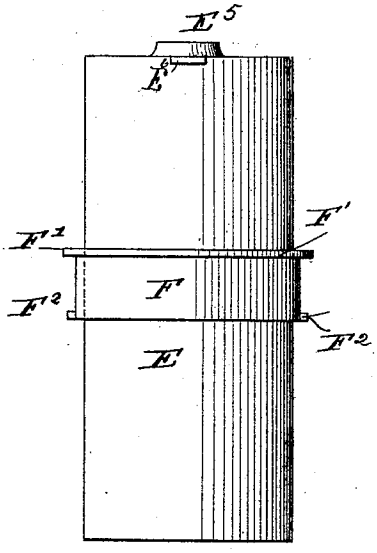


Fig. 8.

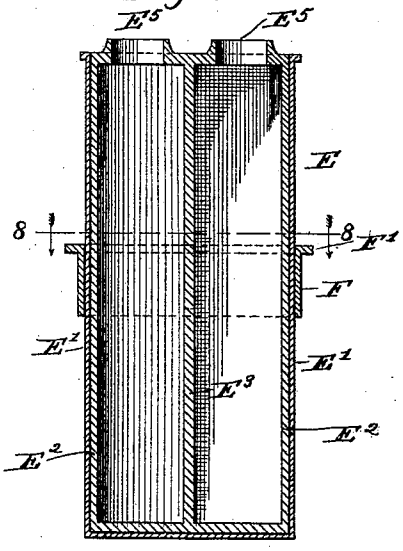


Fig. 7a.

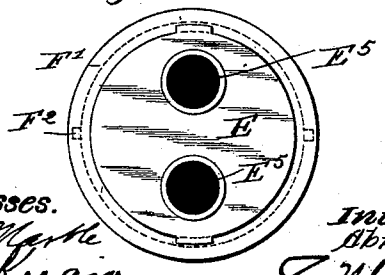
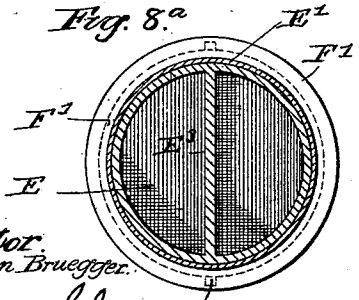


Fig. 8a.



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UNITED STATES PATENT OFFICE.

ABRAHAM BRUEGGER, OF MUSKEGON, MICHIGAN, ASSIGNOR TO THE MUSKEGON CHEMICAL FIRE ENGINE COMPANY, OF SAME PLACE.

CHEMICAL FIRE-ENGINE.

SPECIFICATION forming part of Letters Patent No. 500,189, dated June 27, 1893.

Application filed October 29, 1892. Serial No. 450,384. (No model.)

To all whom it may concern:

Be it known that I, ABRAHAM BRUEGGER, a citizen of the United States, residing at Muskegon, in the county of Muskegon and State of Michigan, have invented certain new and useful Improvements in Chemical Fire-Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention, while relating generally to that class of chemical fire-engines in which an acid vessel is mounted in a main or mixing cylinder containing an alkaline solution, and means are provided whereby the contents of the two vessels may be mixed, and thus generate the required amount of pressure for working, relates particularly to an improved manner of supporting the acid vessel in said main or mixing cylinder; and it consists in the construction and arrangement of parts hereinafter described, and particularly pointed out in the claims.

One object of my invention is to simplify and improve the construction of the acid vessel, and render it easier and safer to use, and more certain in its action.

Another object of my invention is to so suspend the acid vessel that it may be more convenient to operate, and so that by the action of discharging the acid contents of said vessel, the contents of the main or mixing cylinder may be agitated and made ready for use, thus reducing the amount of attention required to bring the apparatus into action, and increasing the efficiency of the same.

These objects I attain by the use of a cylindrical acid vessel divided into two compartments by a central partition, and having on its outer surface a ring, which enables it to be suspended in a yoke placed between the divided ends of a shaft extending centrally of the main or mixing cylinder. A hand wheel, placed on that end of the shaft which projects from the main cylinder, enables the shaft to be rotated, and agitators, placed on the shaft, insure a thorough agitation of the contents of the main cylinder. The discharge openings in one end of the acid vessel may be closed by means of a circular plate which is on the lower end of a valve rod, working through an aperture in the removable dome saddle of the main cylinder, and which may be pressed against the discharge openings of the acid vessel and thus close the same, or may be removed from the same at will.

My invention is fully illustrated in the accompanying drawings forming a part of this application, in which the same reference numerals refer to the same or corresponding parts, and in which—

Figure 1 is a vertical section of the main or mixing cylinder on the line 1 1 Fig. 2, showing the acid vessel in position, the central shaft, and the agitators on the same. Fig. 2 is a section of the same on line 2 2 Fig. 3. Fig. 3 is an end view of the main or mixing cylinder, showing in dotted lines the acid vessel in upright position. Fig. 4 is a similar view, showing the acid vessel partly tipped over. Fig. 5 is a detail plan view of the yoke which carries the acid vessel. Fig. 6 is a detail view of the inner surface of the circular ring forming a portion of said yoke, taken on the line 6 6 Fig. 5. Fig. 7 is a front elevation of the acid vessel. Fig. 7^a is a plan view of the same. Fig. 8 is a sectional view of the acid vessel. Fig. 8^a is a section of Fig. 8 taken on the line 8 8.

Referring to the drawings, A represents the main or mixing cylinder, and is provided with the convex ends A′, on the inner surface of which are formed centrally the projections A^2. Toward one end of the main cylinder, which will be called for convenience the rear end, is formed the dome A^3, which is provided with the removable dome saddle A^4, through an aperture in the center of which plays the valve rod A^5, having on its lower end the circular plate A^6, and on its upper end the hand-wheel A^7. The lower surface of said circular plate is countersunk and filled with lead, which is then planed down so as to present a smooth, level surface, for a purpose which will hereinafter appear. The outlet opening G is formed in the front end of the cylinder.

Centrally of the main or mixing cylinder, and having bearings in the projections A^2 formed in the ends A′ of the same, extends the shaft C, on which are mounted the agita-

tor C′. Shaft C projects from the rear of the main cylinder, having the hand wheel C^2 secured on its projecting end. Shaft C is divided inside the cylinder A and near the rear end of the same, and between the divided ends is hung the yoke D, the ends of said shaft passing into the hollow ends of the yoke, and being secured therein by the pins *c*.

Centrally of yoke D is formed the ring D′, which is divided into two parts, the removable part D^2 being removably held in place by the bolts *d*. On the inner surface of said ring are formed the locking grooves D^4, which are diametrically opposite each other, and which, after extending down a short distance, branch off at right angles, and unite into a single circular groove D^5. The position of the grooves D^4 is so chosen that the line of division between the two parts of the ring D′ also divides said grooves. This construction of the yoke D has been found of advantage in practical construction, as it permits of the entire separation of all of the parts should anything get out of order. The acid-vessel E, which is suspended in said ring, consists of an outer casing, in which is placed the acid vessel proper. The outer casing E′ is without a top or cover, but is provided with a bottom. The acid vessel E^2 is formed of lead, or other material not affected by acids, fits tightly into the casing E′, and is removably held in place therein by any suitable means. It is provided with the central partition E^3, and in its top E^4 are formed the upwardly-flanged discharge openings E^5. By thus dividing the acid vessel into two compartments, provision is made for the use of two kinds of acids.

Centrally of the casing E′ is placed the ring F, whose upper edge is flanged at F′, and on whose lower edge are formed the lugs F^2, which are diametrically opposite each other. The outer casing E′ is also provided with the handles E^6 at its upper edge, by which it may be grasped and lifted. The acid vessel E, when placed in position in the ring D′, is directly under the dome A^3 in the main cylinder, and the openings E^5 in said acid vessel may be covered and tightly closed by the circular plate A^6 on the lower end of the valve rod A^5, when desired.

The operation of charging the apparatus is as follows: The dome saddle is first removed from the dome in the main or mixing cylinder, and the cylinder is filled with water nearly to its top. Bicarbonate of soda, or other suitable alkali is then thrown into the water, and the agitators C′ revolved a few times to perfect the solution of the alkali. The acid vessel E, which has previously been charged with the proper acids, is then lifted by the handles E^6, and placed in position in the ring D′, the lugs F^2 on the ring F engaging with the grooves D^4 on the inner surface of said ring, and slipping in the same until stopped by the flange F′ striking the upper surface of the ring D. The width of the ring D having been chosen to correspond with the length of the slots D^4, when the downward movement of the acid vessel is stopped, the lugs F^2 are ready to enter into the circular groove D^5, and a turn of the vessel causes them to enter said grooves, and securely lock the acid vessel E to the yoke. The dome saddle is then put in place, and the circular plate A^6 screwed down, so as to tightly cover the openings E^5 in the top of the acid vessel E.

When it is desired to bring the apparatus into action, the plate A^6 is first removed from the openings E^5, and then the shaft C is revolved, thus discharging the contents of the acid vessel, and thoroughly agitating the contents of the main or mixing cylinder. The acid vessel, by its revolution, assists the agitators C′ in effecting the agitation.

The simplicity of the apparatus as described will be apparent, and it will be readily understood that by thus mixing and agitating the acid and alkali solutions, a very high grade of efficiency is obtained.

It is obvious that many changes may be made in the construction of the apparatus herein described without departing from the spirit of my invention, and hence I do not limit myself to the particular construction herein shown and described, but

What I claim as new, and desire to secure by Letters Patent, is—

1. In a chemical fire engine, the combination with a main or mixing cylinder, of a divided shaft extending centrally through the same, a yoke between the divided ends, an acid vessel suspended in said yoke, and means for rotating said shaft, substantially as described.

2. In a chemical fire engine, the combination with a main or mixing cylinder, of a divided shaft extending centrally through the same, a compound yoke secured between the divided ends of said shaft, an acid vessel mounted on said yoke, and means for rotating said shaft, substantially as described.

3. In a chemical fire engine, the combination with a main or mixing cylinder, of a divided shaft extending centrally through the same, a two-part yoke secured between the divided ends of said shaft and provided with means for holding the removable part in position, an acid vessel suspended in said yoke, and means for rotating said shaft, substantially as described.

4. In a chemical fire engine, the combination with a main or mixing cylinder, of a divided shaft provided with agitators extending centrally through the same, a yoke secured between the divided ends of said shaft, an acid vessel suspended in said yoke, and means for rotating said shaft, substantially as described.

5. An acid vessel, consisting of an outer casing provided with a bottom, an inner casing of non-corrodible material provided with a central partition and having openings in its top or cover, and a collar placed centrally on

said outer casing having a flange on its upper edge and lugs on its lower edge, substantially as described.

6. In a chemical fire engine, the combination with a main or mixing cylinder, having a divided shaft extending through the same between the divided ends of which a yoke provided with a locking slot is secured, of an acid vessel provided on its outer surface with a collar having a flanged upper edge, and lugs on its lower edge, substantially as described.

7. In a chemical fire engine, the combination with a main or mixing cylinder having a divided shaft extending centrally through the same and a yoke secured between its divided ends, of an acid vessel having discharge openings in one end secured in said yoke, means for closing said discharge openings, and means for rotating said shaft, substantially as described.

8. In a chemical fire engine, the combination with a main or mixing cylinder having a divided shaft extending centrally through the same and a yoke between the divided ends in which is suspended an acid vessel having openings in one end, of a valve stem provided on its lower end with a circular plate, and working through a dome in the main or mixing cylinder, for closing said openings in the end of the acid vessel, and means for rotating said stem or rod and said acid vessel, substantially as described.

9. In a chemical fire engine, the combination with a main or mixing cylinder having a divided shaft provided with agitators extended through the same and bearing an acid vessel having openings in one end suspended in a yoke secured between the ends of the divided shaft, of a valve rod provided at its lower end with a circular plate, and working through a removable dome saddle for closing the openings in the end of the acid vessel, and a hand wheel for operating said shaft, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ABRAHAM BRUEGGER.

Witnesses:

WILLIAM A. GLEW,

N. J. BROWN.