A. Stone,

Fire Engine.

No. 12,038. Patented Dec. 5, 1854.

Fig. 2.

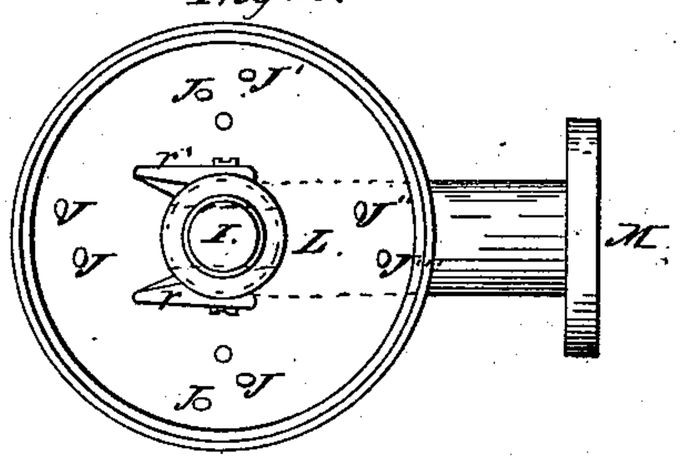


Fig. 1.

Fig. 4.

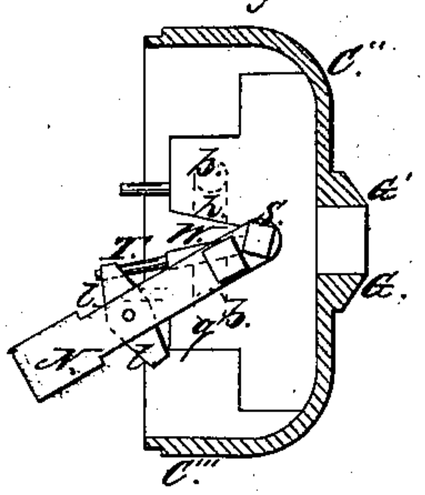
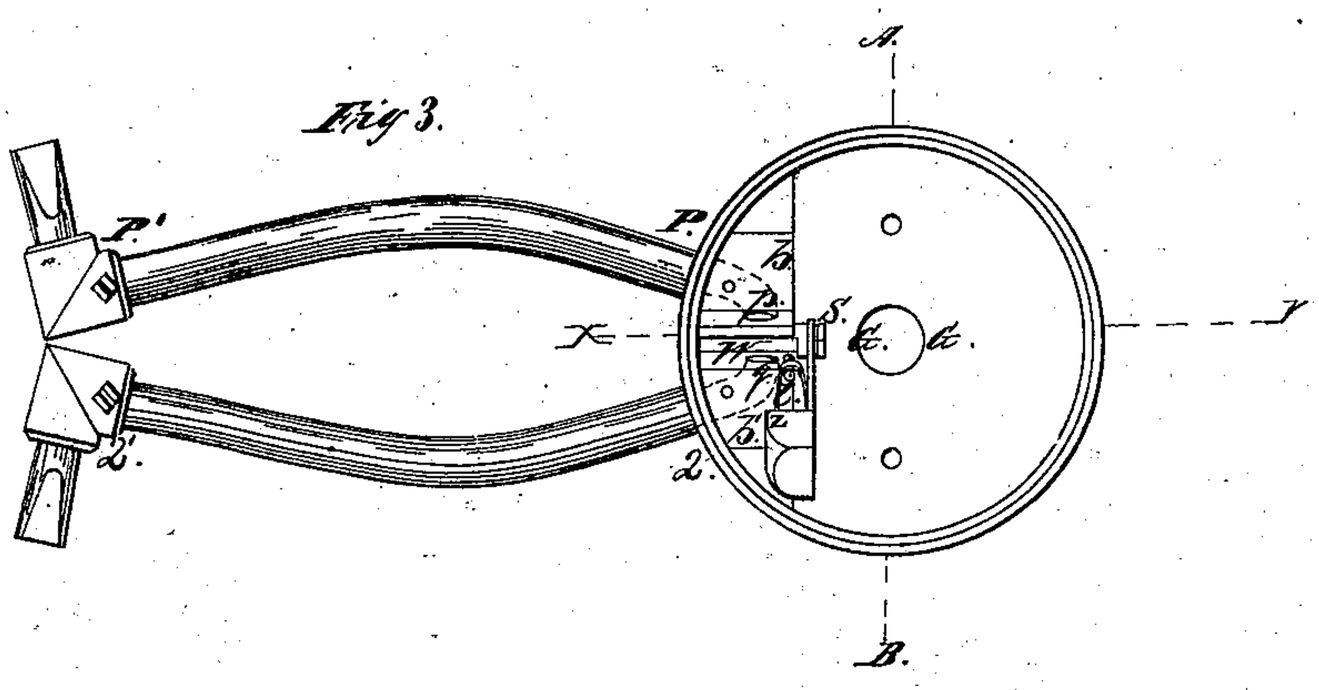


Fig 3.



UNITED STATES PATENT OFFICE.

AMASA STONE, OF PHILADELPHIA, PENNSYLVANIA.

METHOD OF EXTINGUISHING FIRE IN INACCESSIBLE PLACES.

Specification forming part of Letters Patent No. **12,038**, dated December 5, 1854.

To all whom it may concern:

Be it known that I, AMASA STONE, of the county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in the Construction of Apparatus for Extinguishing Fires in Houses and in Ships, of which the following is a specification.

The nature of my improvement as applied to houses consists in arranging a series of water-pipes throughout a building so that a pipe shall terminate in the ceiling of each room, and so that all the pipes shall start separately from the lower portion of the front of the main building or other place of convenient access. To the extremity of each pipe so placed on the ceiling of each room I attach a spherical reservoir made to oscillate or rotate about a vertical axis and furnished with numerous small jets or apertures around its outer surface, so that the water may be jetted in all directions into the apartment and completely wetted. One of these oscillating reservoirs is to be permanently attached to the pipe in the ceiling of each room, so that by connecting a hose to the outer extremity of the same pipe the oscillating reservoir will immediately fill with water, commence oscillating, and cover the whole of the inside of the room with water. This will be found particularly advantageous in case of a fire breaking out in the interior of large stores or warerooms to which it is dangerous or impossible to gain access.

To enable others skilled in the art to make and use my improvement, I proceed to describe its construction and mode of operation, reference being had to the annexed drawings, in which—

Figure 1 represents a vertical section of my improved oscillating reservoir, taken on the line X Y of Fig. 3; Fig. 2, a view from below of the upper hemisphere of the reservoir when cut open on the line D E of Fig. 1, together with the shaft on which it rests; Fig. 3, an inside view from above of the lower hemisphere when opened on the line D E of Fig. 1. Fig. 4 represents a view of the lower hemisphere as shown by a vertical transverse section taken on the line A B of Fig. 3.

C C′ C″ C‴, Fig. 1, represent the section of a spherical chamber or reservoir made of cast-iron, the two hemispheres of which are united together at the line D E.

At F F′ and G G′ are two circular openings in the cast-iron reservoir, which are formed into bearings. A hollow vertical shaft or tube H I passes down through these apertures F F′ and G G′. This vertical axle has journals turned on its outer periphery opposite to the bearings F F′ and G G′. The hollow shaft or tube H I has a flange at H, by which it is to be permanently screwed or secured to the ceiling in any room where it is desired to suspend the apparatus. The reservoir C C′ C″ C‴ is then supported upon the hollow shaft H I at the points F F′ and G G′, and the reservoir is thus left free to revolve around the shaft at these points upon the bearings F F′ and G G′. The fixed shaft or tube H I is connected by a lateral tube L M, which communicates with one of the main pipes passing to the front of the building.

At N N′ two openings are made on opposite sides of the hollow shaft or tube H I, through which the water enters into and fills the interior of the reservoir C C′ C″ C‴. From the lower portion of the lower hemisphere two radial tubes P P′ and Q Q′ (seen at Fig. 3) extend outward. Each of these tubes has a small elbow-jet at its extremity, the direction of the jet on one tube being opposite from that on the other.

When the water is forced through the pipe L M and through the hollow shaft H I into the reservoir, it passes through the orifices of one or other of the radial tubes P P′ or Q Q′ and discharges through its elbow-jet. The effect of this discharge is to cause the tube to react or move in a direction contrary to the direction of discharge, and thus cause the reservoir C C′ C″ C‴ to revolve upon the bearings F F′ and G G′ about the fixed shaft H I.

The orifices from the reservoir into the radial tubes P P′ and Q Q′ are shown at *p* and *q*, Figs. 3 and 4. These orifices are made in small upright blocks or valve-seats *b* and *b′*, and between these orifices a small upright valve *w* oscillates about a pivot at S. A small stem T projects from the upper edge of the valve *w*. A vertical lever *x* oscillates about S as a fulcrum. This lever has a weight *y* attached to its upper extremity and a trans-

verse loop *l* fixed across it, so as to inclose the stem T.

Two projecting pieces *r r'*, Fig. 2, project from the fixed vertical shaft H I, and as the reservoir C C′ C″ C‴ is rotated by the reacting force of either of the jets P′ or Q′ one or other of the projections *r* or *r'* catches the lever *x* and throws it back in a direction contrary to the direction of motion of the reservoir at the time. As this lever falls the loop *l* catches the valve-stem T and carries over the valve *w* from the orifice *p* of one tube against the orifice *q* of the other radial tube Q Q′ which has been operating. This movement of the valve stops the reaction of the tube Q Q′ and brings the other radial tube P P′ into operation, and thus the reservoir is forced to revolve in the opposite direction. As the reservoir moves in this last direction the lever *x* is again caught by one of the projections *r* or *r'* and forced to move from the orifice *q* to the orifice *p*. Thus the radial tubes P P′ and Q Q′ alternately come into and pass out of action, and the reservoir C C′ C″ C‴ is kept constantly rotating or oscillating backward and forward through about ninety degrees, more or less.

A series of small jets or apertures J J′ J″, &c., are arranged around the upper hemisphere of the reservoir, as shown in Fig. 2, two or more in each quadrant. Water flows from these in constant streams whenever it is forced into the reservoir through the tube H I. The oscillation or rotation of the reservoir by means of the arms P P′ and Q Q′, as above described, causes the water thus issuing from the jets J J′ J″, &c., to be distributed uniformly and thoroughly throughout the interior of the room.

The apparatus as thus described is made of cast-iron in two hemispheres, and after the interior arrangement of valves has been made, as above mentioned, the two hemispheres are fitted together by a lip-joint. (Shown at D E, Fig. 1.) The projecting tubes P P′ and Q Q′ are likewise made of iron and firmly attached to the reservoir. The valve *w* is so adjusted that as it falls upon one side or the other it shall just coincide in inclination with the corresponding surface of the valve-seat *b* or *b'* and securely close the orifices *p* or *q*. The valve will be kept pressing against the orifice by the force of water in the reservoir until the lever *x* throws it over against the other orifice.

The operation of the apparatus is as follows: One of these apparatus is to be permanently suspended from the ceiling in each room and connected to a pipe passing down to the lower part of the exterior of the building or other most convenient place. In case a fire should break out in any room so furnished, a hose from an engine, a fire-plug, or other source is to be attached to the exterior extremity of this pipe. The water is thus forced through the hollow pipe and axle H I into the interior of the reservoir C C′ C″ C‴, fills that reservoir, and issues from the orifice at P′ or Q′, and jets out at the apertures J J′ J″ J‴, &c. The alternate reaction of the tubes P P′ and Q Q′, as above explained, causes the apparatus to oscillate, as above described, and diffuse the water throughout the room.

The reservoir C C′ C″ C‴ above described, instead of being operated by the arrangement of reacting tubes P P′ and Q Q′ and valve *w*, may be made to oscillate or revolve by gearing outside of the apartment. This mode will sometimes be found well adapted for the holds of ships. On shipboard I would then place in as many situations below deck as may be deemed prudent reservoirs without valves and reacting tubes and attach each one to a key passing through and above the upper deck, where it may be rotated or oscillated by hand. The pipe leading to these reservoirs is to be connected by a hose with a source of water, as above shown.

Having thus described my improvement, I do not desire to limit myself to the precise mode of oscillating or rotating the apparatus herein described by valves and reacting arms or to any particular shaped reservoir; but

What I do desire to claim and secure by Letters Patent is—

1. The arrangement of the rotating or oscillating reservoir furnished with the jets J J′ J″ J‴, connected with exterior water-pipes and operating so as to diffuse jets or streams of water, in the manner and for the purpose substantially as hereinbefore described.

2. The peculiar combination of reacting arms, valve, and reservoir herein described, by which in one modification of my apparatus the desired rotation or oscillation is effected.

AMASA STONE.

Witnesses:

CHARLES D. FREEMAN,

MASON NAYLOR.