K. GRÜNWALD.

FIRE EXTINGUISHING APPARATUS.

APPLICATION FILED MAR. 29, 1911.

1,065,356. Patented June 24, 1913.

*Fig. 1*

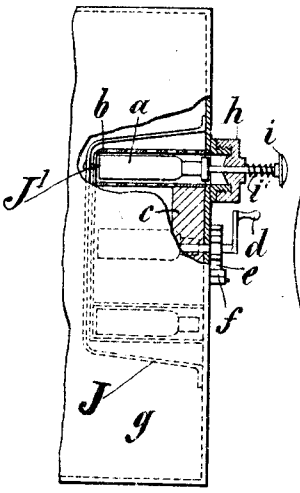



*Fig. 2*

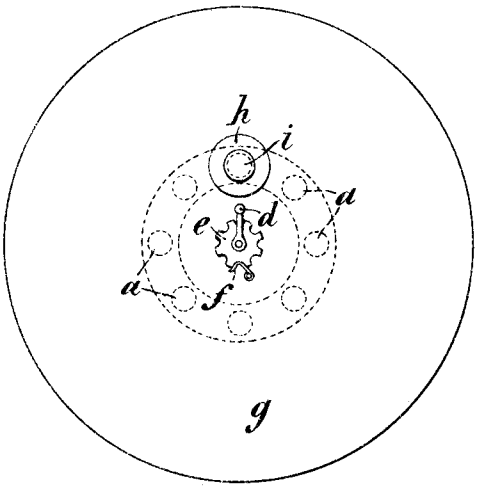



*Fig. 3*

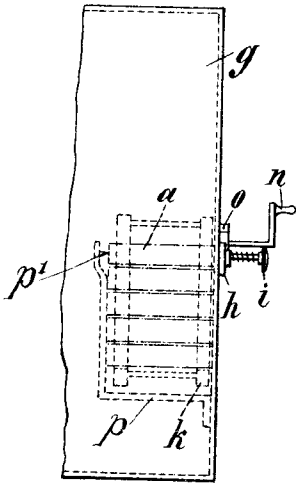
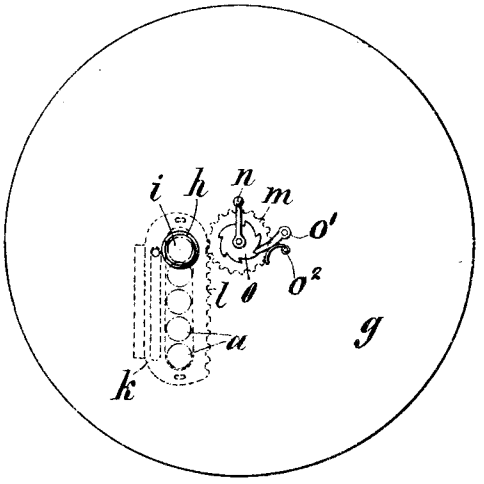



*Fig. 4*




*Witnesses:*

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# UNITED STATES PATENT OFFICE.

KARL GRÜNWALD, OF HAMBURG, GERMANY.

## FIRE-EXTINGUISHING APPARATUS.

1,065,356. Specification of Letters Patent. Patented June 24, 1913.

Application filed March 29, 1911. Serial No. 617,734.

*To all whom it may concern:*

Be it known that I, KARL GRÜNWALD, a citizen of the German Empire, and residing at Hamburg, German Empire, have invented new and useful Improvements in Fire-Extinguishing Apparatus, of which the following is a description.

The present invention relates to fire extinguishing apparatus and has for its object to render the same frequently operative in short intervals.

According to this invention the apparatus is provided with a series of cartridges containing the chemicals or the like for creating the required pressure in the apparatus. Owing to the plurality of cartridges in the same it is only necessary to refill the apparatus with pure water each time after discharge in order to enable its use as often as the number of cartridges remaining in it. The cartridges may be arranged in any desired manner, but preferably like the cartridges in the magazines of revolvers, *i. e.* circularly or one above or beside the other.

In the accompanying drawing Figure 1 is a side elevation partly in section of a revolver-like arrangement of the cartridges. Fig. 2 an end elevation of the same, Figs. 3 and 4 are side and end elevations of a modification of the arrangement of the cartridges.

*g* is the fire extinguishing apparatus and *b* a series of receptacles arranged within the apparatus and receiving the cartridges *a* filled with chemical substances or compressed gases.

*c* is a circular plate or disk within the apparatus *g*, upon which the receptacles *b* are mounted. *d* is a crank connected up with the said plate *c* and extending out of the apparatus *g*.

*e* is a star wheel and *f* a small spring engaging the indentures of the said star wheel.

*h* is a pushing or like device, *i* is a pusher or hammer and $i^1$ a spring controlling the same, all arranged so as to coincide with the cartridges.

*j* is a frame spanning the serie of receptacles *b*, mounted on the end wall of the apparatus and carrying the puncturing device $j^1$ in alinement with the pusher *i* and against which the cartridges may be pushed for puncturing the seal.

The mode of operation is as follows: If the apparatus is to be used the crank *f* is turned for one step and in turn the plate *c* firmly connected up with the same. The receptacles *b* containing the cartridges *a* are thus also moved for one step. On each turn of the crank *d* a cartridge will be brought under the pushing device *h* in such a manner that the same is in coincidence with the pusher *i*, consequently all the cartridges contained in the apparatus will successively be operated. As the crank *d* is firmly connected with the star-wheel *e*, the indentures of which are engaged by the small spring *f*, it will be evident that the plate *c* and in turn the cartridges *a* are advanced step by step and, as the indentures of the star-wheel coincide as regards number and position exactly with the cartridges it is obvious that each movement of the crank *d* will advance one cartridge into position under the pushing device *h*. Now as soon as the pusher or hammer has been operated and the seal of the cartridge punctured, the pusher or hammer *i* is withdrawn and the crank *d* and plate *c* are moved a farther step and so on.

According to the present invention the cartridges are placed within the apparatus *g*, which is advantageous in that the same are kept cool by the water contained in the apparatus *g*. It is evident that the plate *c* may also be arranged externally on the apparatus *g*.

According to the modification shown in Figs. 3 and 4 the cartridges are vertically arranged one above the other in a frame while the pushing device with pusher is provided externally on the apparatus and in one line with the uppermost cartridge. *k* is the frame for the cartridges and *l* a row of teeth or rack provided at the one side of the said frame. *m* is a toothed wheel engaging with the teeth of the said frame. *n* is a crank and *o* a ratchet wheel, both firmly connected with the said toothed wheel *m*. $o^1$ is a pawl and $o^2$ a small spring, controlling the said pawl so as to keep it in engagement with the ratchet wheel thus securing the toothed wheel *m* and the frame *k* in their positions. *p* is a frame mounted on the end wall of the apparatus and carrying a puncturing device $p^1$ in alinement with the pusher *i* and against which the cartridge may be pushed.

The mode of operation is as follows: When the crank is turned for one step the cartridge frame *k* is accordingly moved a certain distance and one of its cartridges *a* brought within the path of the pusher *i*. As soon as the said pusher *i* has been operated

and the cartridge punctured it will be withdrawn, when, if necessary, the frame *k* may be moved again.

I claim as my invention:

1. In a fire extinguishing apparatus, the combination of an entirely closed water-tight holder adapted to hold a suitable liquid and having an end wall; a crank shaft passing through said end wall in a water-tight manner; a crank and a star wheel on said shaft on the outside of the end wall; a spring engaging between the teeth of the star wheel; a circular plate mounted on the shaft and contacting the inner face of the end wall; a series of perforated receptacles mounted on the periphery of said plate, parallel to the shaft; a frame spanning said series of receptacles and secured at opposite ends to said end wall; a puncturing device mounted on said frame, and into alinement with which the receptacles may be successively brought; and a pushing rod in alinement with said puncturing device and passing through the end wall in a water-tight manner.

2. In a fire extinguishing apparatus, the combination of an entirely closed water-tight holder adapted to hold a suitable liquid and having an end wall provided with a wide annular groove on its inner face and an opening in the floor of said groove; a crank shaft perpendicularly passing through said end wall in a water-tight manner concentric with said groove; a crank and a star wheel on said shaft on the outside of said end wall; a spring engaging between the teeth of the star wheel; a circular plate mounted on the shaft and contacting the inner face of the end wall; a series of perforated horizontal receptacles mounted on the periphery of said plate and having one end engaging in said groove; a threaded boss on the outside of said end wall in alinement with said opening; a cap on said boss; a pushing rod passing through said cap and having a knob on the outer end and a piston on its inner end; a spiral spring around said rod between said cap and knob; a frame spanning said series of receptacles and mounted on said frame in alinement with the pushing rod.

3. In a fire extinguishing apparatus, the combination of an entirely closed water-tight holder; a movable frame mounted entirely within the water holder and comprising a plurality of receptacles adapted to hold cartridges; a supporting frame mounted on a wall of the holder; a stationary puncturing device supported in said supporting frame and into alinement with which all of the receptacles are adapted to be brought; means operable on the outside of the water holder for consecutively bringing the receptacles into said alinement; and means movable in said alinement and operable from the outside of the water-holder for pushing said cartridges and pressing the same into puncturing engagement with said stationary puncturing device.

4. In a fire extinguishing apparatus, the combination of an entirely closed water-tight water holder adapted to hold a suitable liquid; a movable frame entirely within said holder and comprising longitudinal receptacles adapted to contain cartridges; a supporting frame mounted on an end wall of said holder a stationary puncturing device mounted on said holder; a movable pusher passing in a water-tight manner through said end wall of the holder in alinement with the puncturing device, between and in alinement with which and the puncturing device the said receptacles are adapted to be successively moved, in which successive positions the cartridges may be pushed by the pusher into puncturing contact with the stationary puncturing device; a crank entirely on the outside of said holder and having a crank shaft passing in a water-tight manner through the wall of the holder into operative engagement with said frame whereby the frame may be moved into said positions; a toothed wheel on said crank shaft; and yieldable means engaging between the teeth of the wheel for holding said frame in said successive positions.

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

KARL GRÜNWALD.

Witnesses.

ERNEST H. L. MUMMENHOFF,

IDA CHRIST. HAFERMANN.