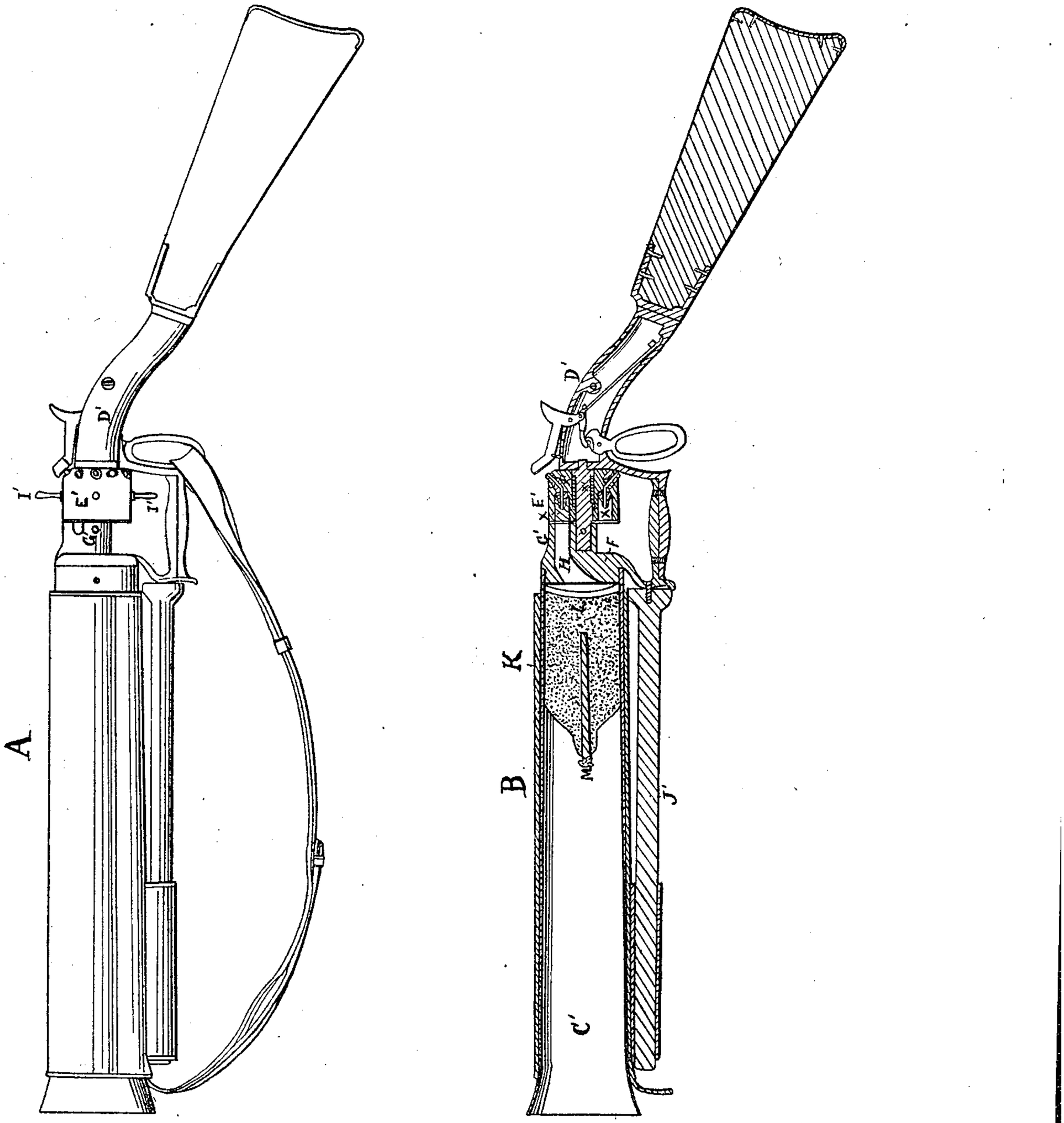
W. MT. STORM.

APPLYING FIRE EXTINGUISHING CARTRIDGES.

No. 13,660. Patented Oct. 9, 1855.



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IMPROVEMENT IN APPLYING FIRE-EXTINGUISHING CARTRIDGES.

Specification forming part of Letters Patent No. **13,660**, dated October 9, 1855.

To all whom it may concern:

Be it known that I, WM. MT. STORM, of the city of New York, have invented a new and useful method, plan, or system, of extinguishing accidental fires, the nature of which consists in projecting into the fire a solid compound (combustible and self-supporting of combustion) which, on ignition, shall generate a large amount of gas of fire-extinguishing properties, said compound being made up in cartridges or "fire-slugs," as I term them, and of such form, dimensions, and weight that they may be projected from a species of gun purposely adapted, and by some suddenly released force, as that of gunpowder, and thrown with precision into any given window or equivalent opening in a burning building while the operator may stand at some point—the opposite side of the street, for instance—removed from danger or the heat of the flames.

While there is no more effective agent for extinguishing fires than water, yet it is well known that so far as the immediate *locale* is concerned the damage by water is most often far greater than that of the fire it is intended to extinguish. The records of insurance companies show this. In the use of water, therefore, it is generally by preventing the spread of the fire to contiguous buildings from which, strictly viewed, the benefit is derived, and almost solely by those. A warehouse, for example, containing dry-goods, if on fire in an upper story, the water thrown from a fire-engine filters down, filled with soot and dirt, through every story, and a single staining-drop of this would diminish the market value of many textile fabrics one-half. To meet such cases is, I deem, the only attainable and legitimate end of artificial fire-extinguishing agents, and not in the broad and abstract sense to extinguish fires, for if the ultimate sum total of saving and loss be not estimated, they would be inferior to water.

Attempts to supply the want here indicated have been essayed, and one of these is now largely in use. I will briefly discuss this method, (which is the type of the others of past dates,) that the distinguishing traits and advantages of the method herein particularly specified and especially designed to surmount the defects of the others may be more clearly appreciated. The method referred to consists in generating the gas apart from the fire by the combustion of substances substantially similar to those I employ in a species of retort, and injecting or projecting into or upon the fire the gas so generated in a continuous stream from a hose or similar adjutage. The defects of the system are many. The machine (retort) cannot be discharged but once on each occasion, requiring considerable time to take it apart, clean it of the débris, recharge and readjust it before it can be again put into operation. For this reason, as the whole effect for the given occasion must be concentrated in and derived from a single discharge, it must, to have any material power, contain a large amount of gas-generating material, and is, per necessity, quite too unwieldy, requiring the co-operation of several persons, and cannot be carried up a ladder at all, which is a very serious drawback. Again, once ignited, this massive charge of material must be allowed to burn on, and cannot be checked for the moment, whether its action be found to be directed to a point where it does good execution or not, and thus a very serious waste is almost always unavoidable. Again, where the apparatus cannot be brought directly up to the point of operation the gas has to be conducted to and directed upon the source of the fire by means of air-tight hose which, not being protected, as in the case of water-hose, (always as a natural consequence thoroughly wet,) is constantly liable to be burned through, not only causing thus a great inconvenience and expense; but in such case, from the escape of the gas before reaching the destined point, the whole object is defeated. Again, as the gas has not sufficient gravity to be thrown from a distance, the hoseman is obliged to approach painfully near the flames. For the same reason where there is a strong opposing draft or current of flame the gas cannot of course be forced into the fire so as to have any efficiency of action, while it has the disadvantage of carrying forward a conjunctive or confluent current of air from without to sustain the fire, and so far counteract its own intended effect. None of these defects appertain to my method, which I will now proceed to describe in its practical details.

First, I will describe the gun for throwing with the necessary force and precision the solid gas-generating material into the fire.

A is a full-length exterior view of the gun.

B is a corresponding sectional view. C′ is the barrel, about three inches in bore. In the hollow metal portion of the stock D′ is a self-cocking lock of well-known character, requiring no further description.

E′ is the rotating charge-cylinder of the ordinary form, except that it has sharp-pointed cones *x x* within to perforate the cartridge as it is inserted: These are of course additional to the usual exterior cones for receiving the percussion-caps.

x′ x′ is a spiral spring of considerable force, that presses forward and insures the contact of the charge-cylinder with the recoil-shield F′ at their point of junction. This prevents there ever being left by wear an open joint at this place for the escape of the gas from the charge of powder when exploded. This escape is a great nuisance and loss of force in all many-chambered fire-arms. The spring mentioned is by its action a great preventative, although not an effective cure of the evil.

The face of the cylinder and the back of the recoil-shield have to be a little farther apart than the length of the cartridges used in the former, that they may be easily inserted. This causes the heel G′ of the recoil-shield to be correspondingly long, as also the passage H′ through it.

The charge-chamber is rotated by hand by the little handles I′. The barrel is sheathed with leather, so that as it becomes heated by rapid firing it will not inconvenience the operator.

J′ is the wiper for swabbing out the barrel occasionally, and is also used for pushing down the fire-slugs at each discharge.

I will now describe the fire-slug. K represents it in the gun, whose bore it fits. It is in the form of a solid cake wrapped in thick tough paper, and has a concave base protected (so as not to be punctured and shattered by the discharge) by a heavy pasteboard sole, L′. The object of the concave is that the pressure of the discharge shall have freedom to act upon the whole surface or end area at once. The passage H′ is curved for the same reason, so that the center of the discharge from it shall coincide with the center of the slug. As the slug is of so great diameter, if the discharge struck it eccentric to its longitudinal axis it would pry it over and tend to wedge it in the barrel, and so break up the slug, strain the gun, and lessen the projective force materially, as well as to cause it to "carry wide."

The slug is composed of nitrate of soda, three parts; sulphur, two parts; charcoal, one part. Any ingredients, however, that will generate carbonic and sulphurous acid gases and burn with about the rapidity of rocket-filling compounds will answer. The above ingredients or fire-slug, however, develops on combustion a large amount of carbonic oxide in lieu of carbonic acid, which gas has peculiar properties, as my experiments have proved, for the purpose in view. Carbonic oxide will not support combustion, but will combine with the heated oxygen of the air that is supporting the fire, thereby robbing the fire of that which is necessary to its life, while in the very act of so doing it forms carbonic acid, which has direct antagonistic effect upon fire. Thus a double effect may be attained by developing in the first instance carbonic oxide in lieu of carbonic acid. The sulphurous-acid gas formed at the same time is a most powerful fire-extinguishing agent.

In the center of the cake or slug there is left a tubular-shaped opening, into which is inserted a quick fuse, M, and (owing to the paper on the outside of the slug) this will be the first to become ignited by the fire, and will in turn ignite the slug in its interior, and the body of the slug acts, as it were, as an adjutage, from which the gas rushes with considerable force, effecting its dispersion through the flames—a very important and necessary point.

The slug, of from one-fourth to three-fourths of a pound weight, of this construction can be thrown over or into the highest building and with perfect precision and force, through a thick pane of glass in a window, or through the panel of a door, and pass to the farthest corner of any room in any edifice, by means of a gun substantially as described, and by the force of not over one-half of a standard musket-charge of gunpowder.

Of course, unless just breaking out, a number of such guns must be employed at a fire, and an intermittent volley of such slugs shot in. A single gun will, however, command and extinguish a thousand cubic feet of flame or burning space with ease, and if the space has little or no ventage, it will command three times this. This is a fair estimate made from practical test.

At a great fire in London many years since cannon were in some instances drawn up in front of the burning buildings and fired into the open doors with great effect. In fact, the gas was thus applied to the flames in rapidly-intermittent charges, which very greatly adds to the total amount of execution done with the expenditure of a given quantity of gas, and although this gas was not generated within the flames as in my method, yet from the mode of its application or generation it would have all the projectile power and force of penetration, which is so vitally essential, that mere gas could have, and so far is superior to the method now in use, but of course still more inconvenient of operation. In fact, these methods possess in common like disadvantages in different degrees, and substantially are of the same distinguishing character—to wit, that in all cases the gas is generated within the machine itself and projected by its own elasticity and pressure upon the flames, while my method overcomes all their corresponding inconveniences and disadvantages and develops novel and additional points of efficiency by projecting the solid gas-generating material from the machine

in a concentrated form in moderate, distinct, and rapidly-intermittent masses or charges, and by an exterior and separately generated projectile agency, the after result being the generation of the gas within the flames and apart from the machine, which of course need never be exposed to the destructive contact or action of the fire. I make this latter remark because so much more efficacious is it found to generate the gas within the source of the flames that on every occasion where circumstances will permit the present "fire-annihilator" (a peculiar gas-generating retort) is carried by the operators into the room on fire, set in operation, and abandoned without regard to whether the apparatus gets destroyed or not.

Having now fully described my improved method of extinguishing fires and wherein it so essentially differs from all others, that which I claim, and desire to secure by Letters Patent of the United States, is simply—

The plan of projecting into the flames with precision and penetrating force, by means of an apparatus or gun purposely adapted and by means of a projectile power independently and separately generated, the fire-extinguishing gas-generating solid itself in the concentrated and properly-adapted form, substantially as described, and in moderate, distinct, and rapidly-intermittent masses, as explained, whereby the gas is generated apart from the machine and within the source of the fire, by all of which I attain the many points of increased efficiency and convenience of operation set forth.

WM. MT. STORM.

Witnesses:
I. M. CARNEAU,
WM. H. STORM.