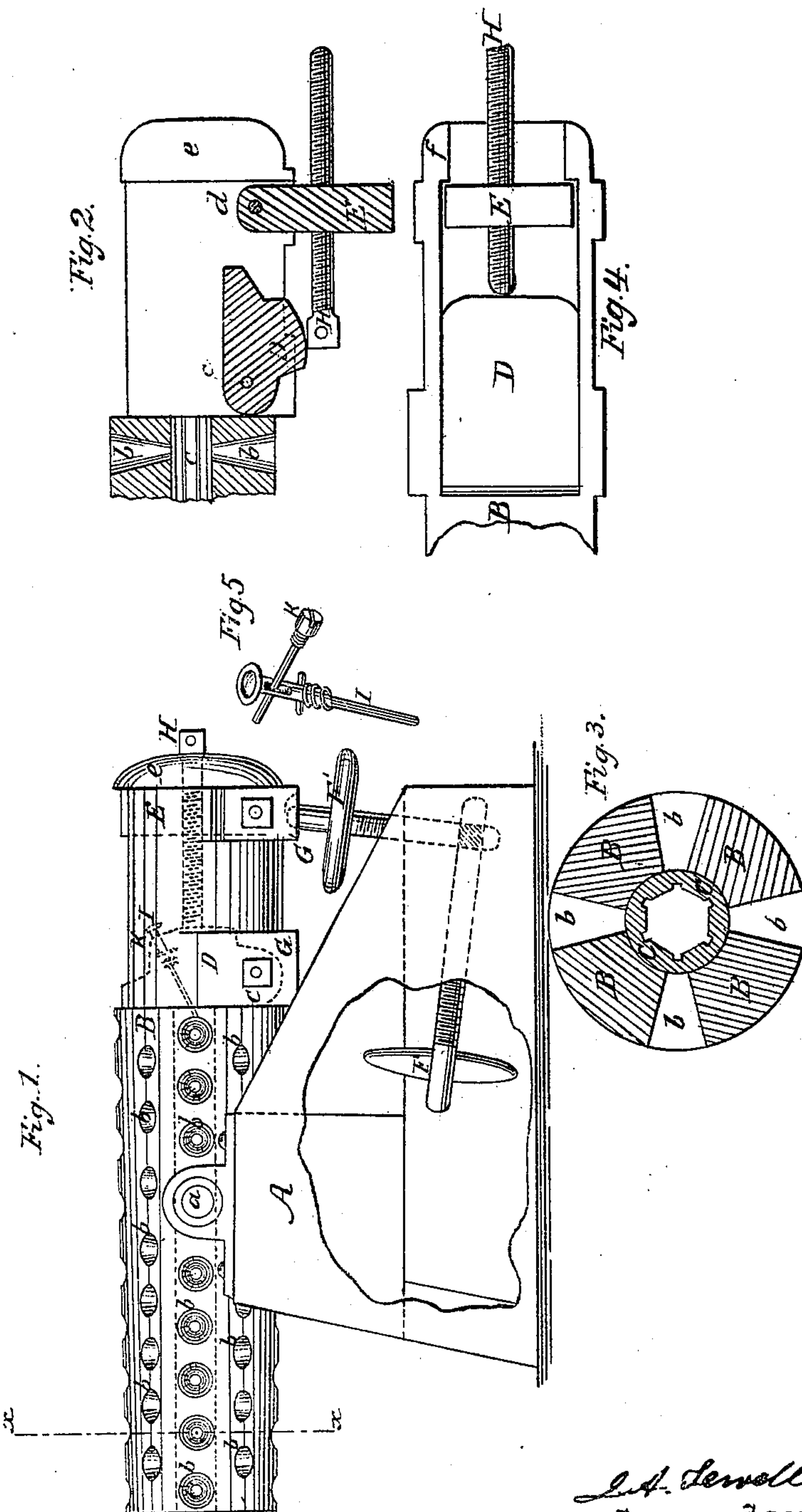


Breech-Loading Ordnance.

No. 85,491.

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Attest
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Letters Patent No. 85,491, dated December 29, 1868.

IMPROVEMENT IN CANNON.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern :

Be it known that I, JOHN A. TERRELL, of Bloomfield, in the county of Nelson, and State of Kentucky, have invented a new and useful Improvement in Cannon; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawing, making part of this specification, in which—

Figure 1 is a side elevation of a gun having my improvements applied thereto;

Figure 2 is a vertical longitudinal section, showing the hinged breech-plate, and the devices for retaining the same in position;

Figure 3 is a vertical section, on the line $x-x$ of fig. 1; and

Figure 4 is a top or plan view.

Corresponding letters refer to corresponding parts in the several figures.

The object of this invention is an improvement in cannon; and

It consists in a perforated reinforce, which encloses the non-perforated barrel or core of the gun; and

It also consists in various other improvements, which will be fully described hereafter.

A is the frame, upon which the gun is mounted, which may be of wood or iron, and of any suitable construction, but which, as it forms no part of my present invention, need not be more particularly described here.

B is the reinforce, having the perforations b formed in it, they being arranged in rows which extend the entire length of that portion of the reinforce which covers the core or barrel of the gun. These apertures are arranged in rows, longitudinally, as above stated, but they are so situated relative to each other, that a line drawn vertically through any one perforation, will pass through the solid metal between the adjoining rows. The form which I believe to be the best for these apertures is that of a truncated cone, with its base pointing outwards. These apertures are best formed by having cores set in the mould when the gun is being cast, as they thus relieve much of the strain which would otherwise be put upon it while cooling; they may, however, be bored through the gun, after it has been turned and bored to receive its core. The diameter of the inner portions of these apertures should be about equal to the thickness of the metal which composes the wall of the core or barrel of the gun. These proportions may be slightly varied, however, without materially affecting the result; the object of such perforations being to permit the radiation of the heat caused by the burning powder and the friction of the outgoing shot. The trunnions of this gun are also to be made hollow, to prevent any accumulation of heat at those points, and to afford further facilities for radiation. To the rear end of the perforated portion of the reinforce is cast, or otherwise secured, a slotted breech-piece, which is of equal diameter, ex-

ternally, with the reinforce at the point of junction. Through this breech-piece there is formed a vertical slot, the width of which is sufficient to receive the hinged breech-plate D, and also the hinged nut E, its length being such as to permit the breech-plate and nut to swing down when released from the control of the screw, as will be more fully described hereafter. This breech-piece is also provided with projections, as shown at G and G', in fig. 1; the purpose of those shown at G, being to receive the bolt C, which forms the hinge upon which the breech-plate turns, while those shown at G' serve the same purpose with reference to the bolt d , upon which the nut E is hinged, they also serving the further purpose of resting-points for the heads of the elevating-screws F F.

C is the non-perforated core or lining, which forms, with its perforated reinforce, the barrel of the gun. It is composed of a cylinder, of brass, iron, steel, or any other suitable metal, brass or bronze being preferred, and is bored perfectly true and smooth on its interior surface, in the usual manner, and may be rifled or not, as preferred, but in any event, it is to be finished with sufficient accuracy to give the required regularity of surface for the passage of the shot. The internal diameter of this cylinder having been established, the exterior surface thereof is turned off parallel thereto, until the thickness of the wall or metal surrounding the aperture for the shot is equal, or about equal, to one-fourth the diameter of the bore or aperture therein, when it is inserted into the perforated reinforce, it having been previously bored to receive it, and heated so as to be properly expanded, and so that as it cools, it will shrink firmly upon said cylinder. It will be observed that this cylinder is open at both ends, which permits of a free passage of air through it, when the breech-plate is turned down, and also permits of its being cleaned or "swabbed" from the rear end, which will be found to be a great convenience at certain times, as, for instance, when the gun is placed within the turret of a monitor, or in any other position where it would necessitate the movement thereof, to gain access to its front end.

D is a breech-plate, which is hinged to the walls of the slot formed in the breech-piece, the bolt upon which it turns, passing through said walls, and through projections G, formed thereon, said bolt passing through the lower portion of such plate, so that it may swing through such slot, and drop down, as shown in figs. 2 and 4, so as to leave a free passage for inserting the charge, and also for "swabbing" or cleaning the gun. This plate is dressed smooth upon its inner face, and when placed in the position shown in fig. 1, forms a tight joint by leaning against the rear end of the reinforce and the enclosed cylinder.

E is a swinging nut, secured to the walls of the slot, and the projections G' formed thereon, in the same manner as is the hinged plate above described, it

being located near the rear end of the slot formed in the breech-piece, and arranged to swing freely through and out at the bottom thereof, so that when dropped down to the position shown in fig. 2, it, with its screw H, will project below said breech-piece; but when in the position shown in fig. 1, it will bear against the stops *e f*, which constitute the rear end of the slot above referred to. It will be seen that when the breech-plate D and the nut E are in the position shown in fig. 1, if the screw H is inserted in the nut, and turned in, so as to press firmly upon the breech-plate, it will hold it in tight contact with the barrel of the gun, thus preventing the escape of any gas which may be generated therein, and at the same time, the nut will be pressed against the stops *e* and *f*, but upon giving the screw H a few turns backward, both the nut and the plate will be liberated, and both will fall down to the position shown in fig. 2, by which means a free passage is formed for the insertion of the "swab" for cleaning the barrel.

F F' are the elevating-screws, which pass through a bar of metal, which extends from one side of the frame to the other, and has its bearings in each, it being so arranged as to turn upon such bearings. Through holes formed in this revolving bar, the screws F F' pass, they being of different lengths, as shown in fig. 1, so as to afford the means of giving the gun any desired amount of depression or elevation.

G G' are projections formed upon the slotted portion of the gun, their office having been previously described.

H is the set-screw, already referred to, which holds the breech-plate in position, which screw should be of sufficient size to receive any strain which may be thrown upon it.

I is a device for exploding the charge, when metallic cartridges are used, which consists of a bolt, having a slot formed therein, near its outer end, for the reception of a pin which passes through it, for the purpose of holding it in position when not in use.

This bolt has upon its outer end, a head or collar, sufficiently large to receive the blow from a hammer or lock placed upon the gun, and it is inserted into the swinging breech-piece, at such an angle as to bring its lower end to the inner surface thereof, at its centre, so that when the blow is given, the charge will be ignited at its centre.

Through the upper portion of this bolt a hole is bored, and a pin is inserted, which rests upon a spiral spring, which is placed around said bolt, below such pin, and which serves to withdraw the bolt after it has been forced down against the cartridge.

Should it become desirable to use the bag-cartridge, the bolt above described may be withdrawn, and powder

used in its stead, which may be ignited with a match, or in any convenient manner.

The manner of arranging the above-described device, is clearly shown in figs. 1 and 5 of the drawings, and on an enlarged scale at I and K.

Some of the advantages which are incident to and which are expected to result from my improvements, are—

First, great facility for the radiation and escape of the heat caused by the burning powder, and friction of the outgoing shot, such heat, in guns of usual construction, being regarded as one of the principal causes of their explosion.

Secondly, by arranging the apertures as described, and casting them in the reinforce, the casting is relieved of much of the lateral as well as the longitudinal strain which would otherwise be put upon it, from its first cooling after having been cast, as well as from constant variations of temperature while in use.

Third, the swinging breech-piece and nut afford great facilities for charging the gun, and for cleaning the same, without any change of its position, the slot in the extreme rear end thereof, through which the screw H passes, being of ample size to permit the passage of the handle of the "swab."

Fourth, the combining of the igniting-device with the swinging breech-plate prevents any deterioration of the barrel at the point where such apparatus is usually applied.

Fifth, the arrangement of the elevating and depressing-screws affords increased facilities for arranging the gun, as they may at any time be turned so as to give the same its greatest possible amount of elevation or depression, without the lapse of time which would be necessary were only one screw used.

Having thus described my invention,

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

1. A perforated reinforce for guns, substantially as shown and described.

2. The combination of the hinged breech-piece D, hinged nut E, and set-screw H, substantially as shown and described.

3. The arrangement of the elevating-screws F F', substantially as shown and described.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

JOHN A. TERRELL.

Witnesses:

EDM. F. BROWN,
D. P. HOLLOWAY.