(No Model.) 2 Sheets—Sheet 1.

E. J. BLOOD.

CANNON.

No. 374,577. Patented Dec. 13, 1887.

Fig. 1.

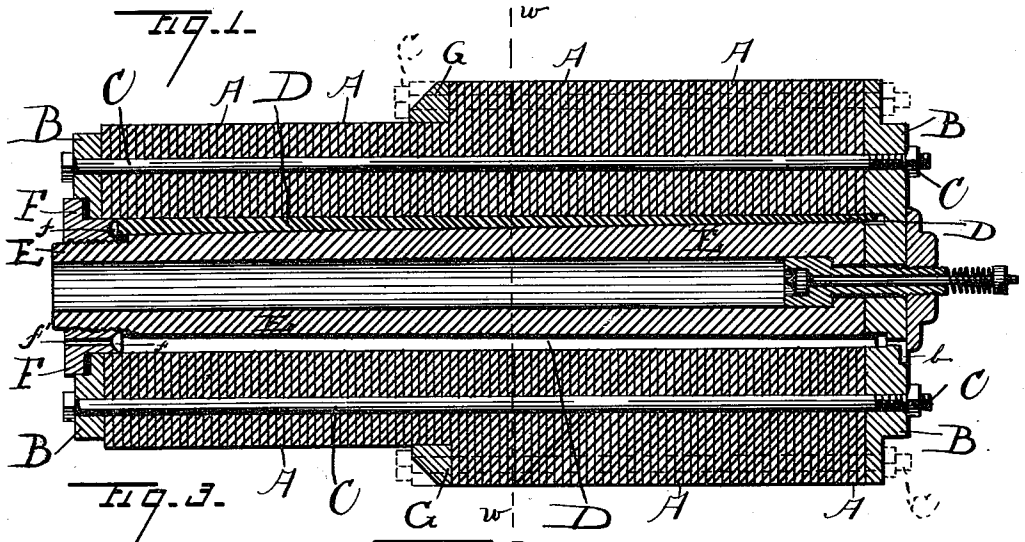


Fig. 3.

Fig. 2.

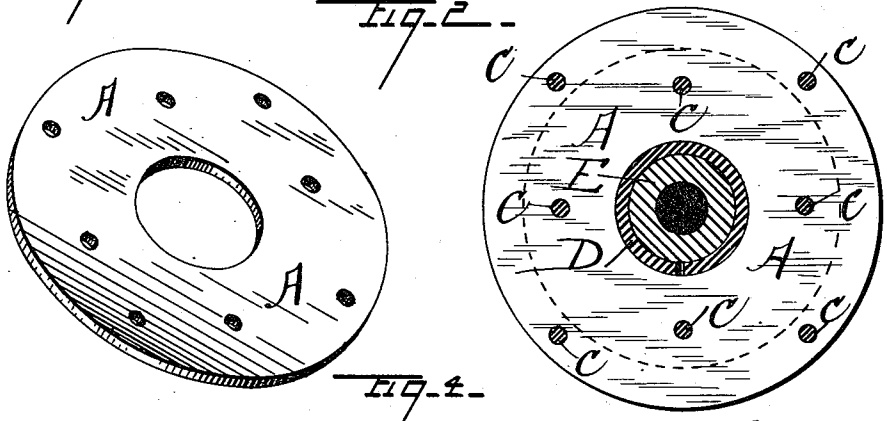


Fig. 4.

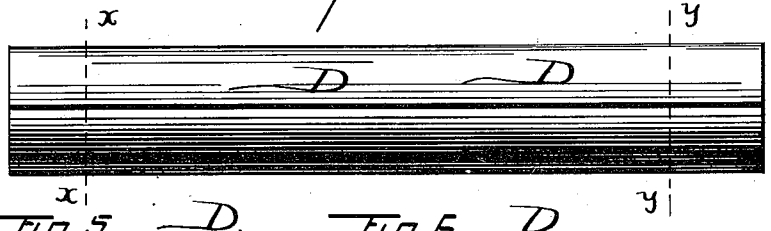


Fig. 5.

Fig. 6.

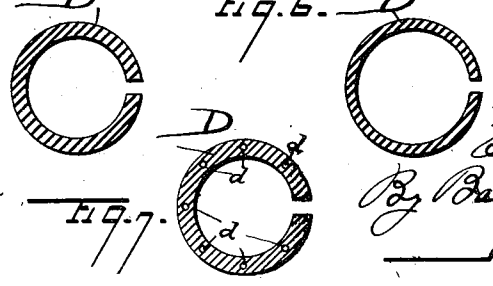


Fig. 7.

Witnesses

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(No Model.) 2 Sheets—Sheet 2.

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CANNON.

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Fig. 8.

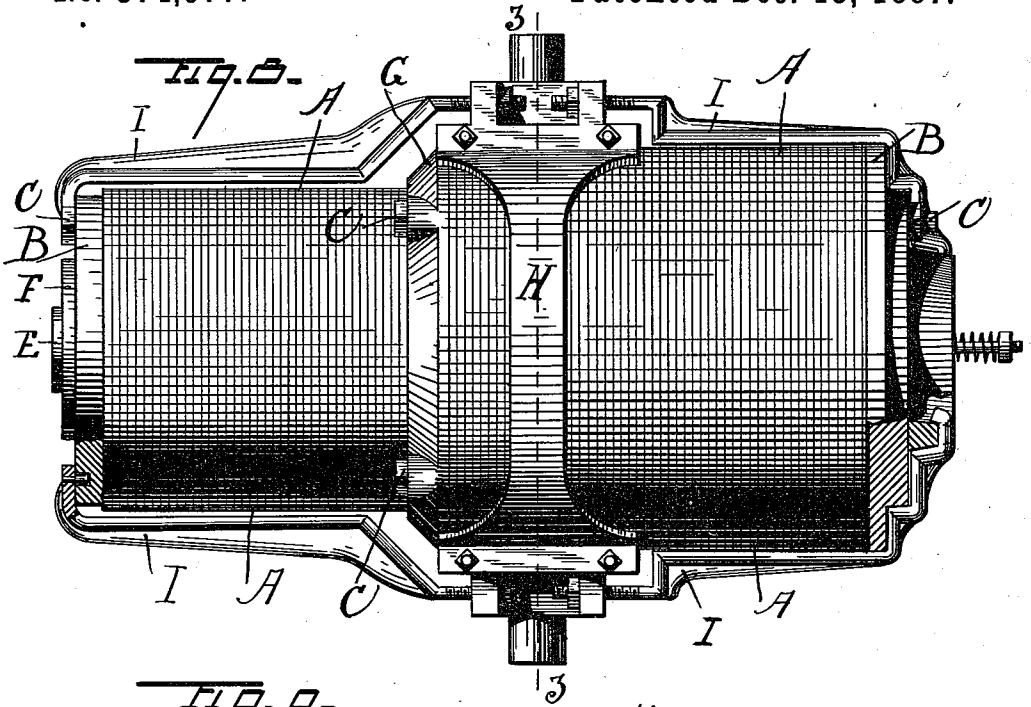
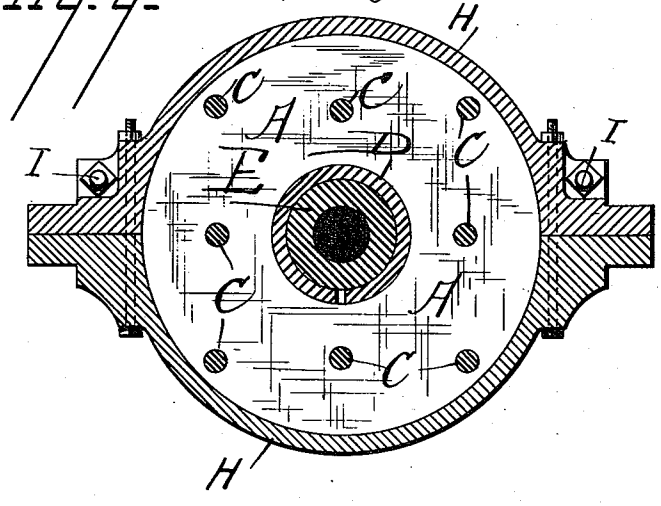


Fig. 9.



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UNITED STATES PATENT OFFICE.

EDWIN J. BLOOD, OF CHICAGO, ILLINOIS.

CANNON.

SPECIFICATION forming part of Letters Patent No. 374,577, dated December 13, 1887.

Application filed March 29, 1887. Serial No. 232,828. (No model.)

To all whom it may concern:

Be it known that I, EDWIN J. BLOOD, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Cannons, of which the following is a specification.

The object of my invention is to make a simple, cheaply-constructed, and powerful cannon which shall be easily transported from place to place; and the invention consists, essentially, in constructing a cannon of thin layers or plates of metal, as hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a longitudinal section of a cannon constructed according to my invention; Fig. 2, a cross-section taken in line *w w* of Fig. 1; Fig. 3, a perspective view of one of the disks or plates used in the construction of my cannon; Fig. 4, a plan view of the tube or sleeve covering the inner barrel of the cannon; Fig. 5, a cross-section taken in line *x x*, and Fig. 6 a cross-section taken in line *y y*, showing the difference in thickness of the metal forming the sleeve at its respective ends; Fig. 7, a cross-section showing air-holes in the sleeve to prevent its becoming overheated; Fig. 8, a plan view of the cannon, with some parts shown in section; and Fig. 9, a cross-section taken in line *z z* of Fig. 8.

A designates the disks or plates from which the cannon is formed; B, the end plates, and *b* air-holes therein; C, the rods extending through holes in the disks and end plates to secure and hold the same together; D, the sleeve surrounding the inner barrel, and *d* air-holes therein; E, the inner barrel or tube forming the bore of the cannon; F, a nut or screw on the inner barrel to tighten or key the parts; *f*, a groove, and *f'* an air-hole therein; G, a ring encircling the body of the cannon in front of the large disks, and which also serves as an end plate for the short securing-rods; H, an adjustable ring or jacket encircling the body of the cannon and provided with trunnions to support it on the carriage, and I arms or side bars extending from the trunnions to the ends of the cannon to more rigidly hold the disks together.

In the construction of my improved cannon I use thin plates or disks, preferably of cast or rolled steel, which are of course of suitable size to form the cannon when put together. The thickness of these disks will vary somewhat, according to the size of the gun for which they are intended; but I prefer to have them from about one-eighth to about one-fourth of an inch thick, although they may be made much thicker. Each of these disks, except those intended to be back of the bore, is pierced in its center, so as to form a hole of proper diameter, so that when they are put together these holes will answer for the bore of the cannon, or as a receptacle for the tube forming the bore. In my preferred form they are also pierced at points away from the center or bore, so that when placed side by side there are, as it were, continuous holes from one end of the cannon to the other, adapted to receive the retaining-rods C to hold the disks together. The outside surface formed by these disks may be of any form or pattern desired, and of course their outside diameter will be regulated somewhat by the kind or size of gun for which they are intended.

When the center holes themselves are used to form the bore of the cannon, it will probably be found advisable to braze the disks together, so as to make them solid or in one body; but even in this case the cannon will be constructed on what I consider an entirely new principle—that is, formed from thin layers or plates of metal, which can of course be made and handled separately until brazed together for final use. If desired, the retaining-rods can be used even when the disks are thus brazed together, and in such case I prefer so to use them.

When it is desired to have the bore formed by the insertion of a tube or inner barrel—and I prefer this construction—the central hole formed by the piercing of the disks should be large enough to receive such tube or barrel and the sleeve surrounding it. This sleeve is somewhat shorter than the tube or inner barrel, and is preferably of uniform diameter on its outer surface and of a slightly varying or tapering diameter on its inner surface, this tapering variation being caused by the difference in thickness of the metal of which it is formed or by the tapering of its bore. It is

also preferably slotted throughout its entire length, so as to permit of the very slight yielding or expansion necessary when the tube is inserted, so as to wedge or key it against the sides of the continuous central hole formed in the disks. When so desired, this sleeve may also have openings or air-holes extending through it lengthwise to prevent it or the cannon from becoming overheated.

The tube or inner barrel is preferably formed of soft steel; but it may be made of any other suitable metal. Its outside diameter is of course adapted to the inside diameter of the sleeve in which it is to be inserted, and is tapered correspondingly. It is made long enough to extend substantially from one end of the cannon to the other—that is, from the outer surface of the front-end plate to the inner surface of the breech-end plate—and its bore is of the size and length desired for the bore of the cannon proper. Its muzzle end is preferably threaded, so that when inserted a suitable nut may be screwed thereon to securely key or hold it in its proper position. Its end nearest the breech-plate is provided with a suitable hole or opening for the breech-pin, which is inserted from the muzzle end, and, passing back, extends through the breech-plate, and is secured and held in position by a nut or other suitable means. This breech-pin of course has suitable shoulders to press tightly against the bottom of the bore. This tube or inner barrel, thus constructed, inserted, and secured, forms the bore of the cannon when constructed without brazing the disks together; or, when desired, it may be used even when this brazing of the disks is employed.

I prefer to construct the nut used on the muzzle end of the inner tube or barrel in such a way that it will have a shoulder adapted to fit into a recess in the muzzle end plate, so that its inner surface will strike and press against the end of the sleeve, thus causing the sleeve to be pressed and wedged in by the tightening of the nut in such a way as will re-enforce the inner tube by all the strength of the outer disks. It will thus be seen that forcing the sleeve in by this turning or tightening of the nut operates to accomplish the object now attained by the shrinking of rings on ordinary cast guns. I also prefer to provide the inner surface of the nut with a groove to pass over or partially over the end of the sleeve, and to make an air-hole in the nut which, by means of such groove, will connect with the air-holes in the sleeve.

When it is desired to have the disks of different outside sizes or diameters, they may be made so as to taper from the breech to the muzzle, or those to be used at the breech end of the cannon may be made larger than those to be used at the muzzle end, and I prefer this latter construction. In such case it will generally be found convenient to have a ring encircle the body of the cannon in front of the large disks, which may also serve as an end plate for the short securing-rods inserted through the large disks near the outside surface formed by putting them together where such rods are used.

An adjustable jacket may encircle the body of the cannon, and, being provided with trunnions, operate to support it on its carriage. I prefer to construct this ring or jacket in two parts, so that the inside diameter of each will form a semicircle and the two together be sufficient to encircle the entire body of the gun. These two parts may be properly fitted over the cannon and then secured together by bolts, nuts, and screws, or any other suitable way. When so desired, this adjustable jacket may be provided with projections at or near its trunnions to receive the ends of side bars or arms, which may extend therefrom to either end of the cannon and be used to more rigidly secure the disks together. These side bars may be secured at the ends of the cannon in any convenient way; but I prefer to secure the ones at the muzzle end by having them hooked into holes in the end plates and the ones at the breech by means of a ring provided with notches, into which the ends of the bars are hooked, this ring being of suitable size to fit over the nut securing the breech-pin and still be between the nuts on the ends of the rods holding the disks together. The ends of the arms or side bars passing through the projections on or near the trunnions may be threaded, so as to be secured or tightened by suitable nuts.

Some of the advantages of my invention are, that it enables heavy guns to be constructed with all the advantages of great weight, but without the disadvantages thereof, the same being made and mounted in sections and in very short time; that it enables the builder to detect and reject impure or weak metal and to avoid the initial strain due to the impossibility of cooling a great mass of metal equally rapid in all its parts; that it dispenses with the use of ponderous implements now necessary in the casting and handling of guns of great weight; that it enables a correct estimate of the strength of the gun to be made while it is being built, or after it is finished, without the necessity of hydraulic or other tests; that it enables a large gun to be made as cheap per pound as a small one; and, generally, that it enables the gun to be taken apart and put together at pleasure, thus greatly facilitating its transportation for use or other purposes.

The essence of my invention being the construction of a cannon from readily-detachable plates or layers of metal, I do not wish to be understood as limiting myself to special forms or details of construction; and therefore the special means described for securing the parts together or aiding in their operation are not to be understood as indispensable to my construction, but most of them may be used or omitted at pleasure.

I am aware that cannons have been heretofore constructed of a series of thin tubes, one

within another, and of course having the seams between the different tubes extending lengthwise of the barrel; but in practice the parts of a cannon of this construction are not detachable, and, without regard to other points, my invention differs therefrom in that my layers or plates of metal are so made and placed together as to cause the seams between them to extend crosswise of the barrel, or substantially at right angles to the bore of the gun.

I claim—

1. A cannon comprising layers or plates of metal, end plates, rods for securing the layers and end plates together, an inner tube or barrel, and a surrounding sleeve slotted and having air-holes extending lengthwise therein, substantially as described.

2. A cannon comprising layers or plates of metal, end plates, rods for securing the layers and end plates together, an inner tube or barrel, and a slotted sleeve surrounding the inner tube or barrel, substantially as described.

3. A cannon comprising layers or plates of metal, end plates, rods for securing the layers and end plates together, an inner tube or barrel threaded at its muzzle end, and a nut on such muzzle or threaded end circumferentially grooved at its inner surface and having an air hole or opening, substantially as described.

4. A cannon comprising layers or plates of metal, end plates, rods for securing the layers and end plates together, an inner tube or barrel tapering on its outside surface, a sleeve surrounding the inner tube or barrel oppositely tapering on its inside surface, and a nut on the outer end of the tube or barrel fitting and pressing against the end of the sleeve, substantially as described.

5. A cannon comprising layers or plates of metal, end plates, rods for securing the layers and end plates together, and an adjustable jacket encircling the body of the cannon and provided with trunnions, substantially as described.

6. A cannon comprising layers or plates of metal, end plates, rods for securing the layers and end plates together, an adjustable jacket encircling the body of the cannon having projections, and side bars or arms extending from such projections to the ends of the cannon and secured at such ends, substantially as described.

7. A cannon comprising layers or plates of metal, end plates, rods for securing the layers or plates of metal together, an adjustable jacket provided with trunnions and projections, and adjustable side bars or arms extending from such projections to the ends of the cannon and secured at such ends by being hooked into notches or holes, substantially as described.

8. A cannon comprising layers or plates of metal, end plates, rods for securing the layers and end plates together, a lining barrel or tube having a shoulder on its inner surface near its rear end, and a breech-pin extending back of the rear end of the lining-tube and having a shoulder near its forward end to engage with the shoulder of the lining-tube, and means for tightening or pressing such shoulders against each other, substantially as described.

9. In a cannon, a removable lining-tube tapering on its outer surface and having at least one of its ends provided with means for keying it firmly in position, and a surrounding slotted sleeve oppositely tapering on its inner surface, substantially as described.

EDWIN J. BLOOD.

Witnesses:
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E. F. HUBBARD.