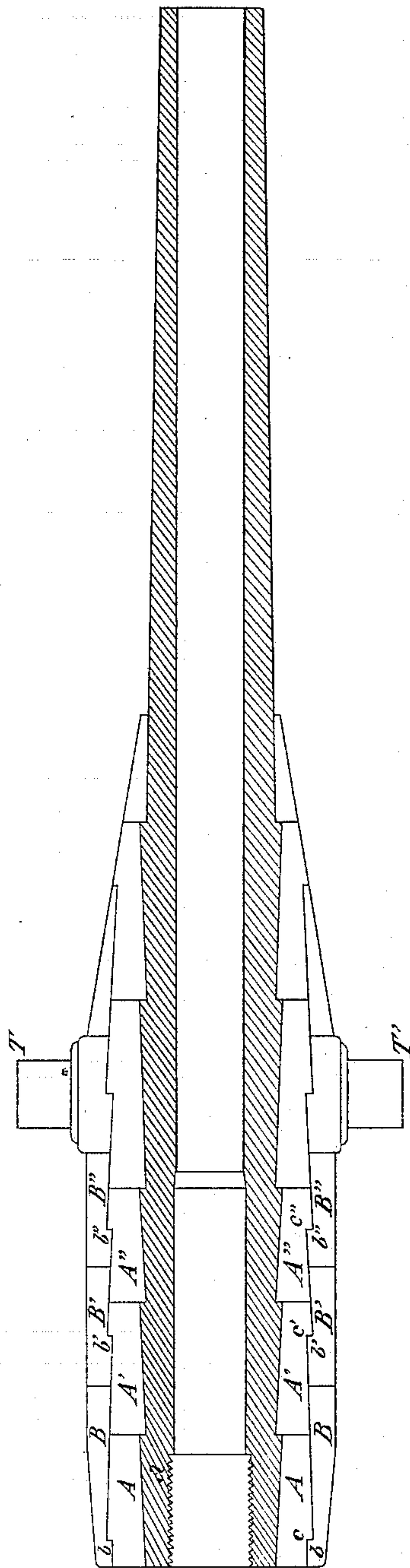


(No Model.)

G. A. CASSAGNES.
BREECH LOADING ORDNANCE.

No. 303,983.

Patented Aug. 26, 1884.



Scale of $\frac{1}{20}$

Witnesses

Crazio Fugo
Thompson

Inventor

Gilbert H. Cassagne

UNITED STATES PATENT OFFICE.

GILBERT A. CASSAGNES, OF PARIS, FRANCE.

BREECH-LOADING ORDNANCE.

SPECIFICATION forming part of Letters Patent No. 303,983, dated August 26, 1884.

Application filed August 13, 1883. (No model.) Patented in France February 12, 1883, No. 153,671, and in Belgium February 14, 1883, No. 60,448.

To all whom it may concern:

Be it known that I, GILBERT ALFRED CASSAGNES, a citizen of the Republic of France, residing in the city of Paris, Department of the Seine, have invented certain new and useful Improvements in the Method and Manufacture of Ordnance, of which the following is a specification.

My invention relates especially to the strengthening of cannons longitudinally, and particularly to the manner of constructing the same. Its object is to equalize the pressure produced by the explosion of the charge throughout the different parts of the gun, and to transmit by means of conical hoops or collars provided with steps and shoulders surrounding the central tube, the longitudinal pressure on the end of the bore to the hoops, so that the breech cannot be blown out without breaking the hoops themselves.

In certain Letters Patent of the United States heretofore granted to me, viz., No. 279,236, dated June 19, 1883—I have described an improved method in the construction of ordnance, which consists in strengthening the barrel by means of conical hoops, each layer being placed with their apexes inverted, and breaking joint so as to strengthen the cannon in the longitudinal as well as in a transversal sense.

My present invention consists especially in devices for the longitudinal strengthening thereof by means of steps or shoulders on the aforesaid hoops, as it will be fully shown and described hereinafter. The method, as actually in use for the strengthening of guns, generally consists in surrounding the chamber and barrel with metallic hoops or collars. These are placed on while hot, and allowed to cool down and shrink in position. Their contraction evidently adds enormously to the transversal strength of the weapon, although having but little effect on the longitudinal resistance. My invention, however, is to apply these hoops or collars in such a manner that they contribute at one and the same time to the transversal and longitudinal resistance of the gun. In order to accomplish this result, the internal and external surfaces of the hoops are shaped conically, and in any two adjacent

layers the inclination of these cones is inverted, so that any longitudinal strain that might arise from the firing of the gun will have for effect to wedge in more firmly the hoops or collars; also, the hoops or collars of two adjacent layers break joint; and on each hoop or collar, above the first row, I leave, externally, a step or shoulder, which fits in a similar recess in the internal surface of the hoop immediately above it, so as to hook or lock together all the different parts.

In order that my said invention may be most fully understood and readily carried into effect, I will proceed to describe the drawing hereunto annexed.

The figure represents to scale of one-twentieth, in order to show the exact dimensions of all pieces, (except the inclination of the conical surfaces and the steps or shoulders, which are greatly exaggerated,) a longitudinal section of a gun made according to my invention. The tube *a* is turned externally with a series of conical zones terminated by steps or shoulders to receive the hoops or collars shaped to fit the different zones of the external tube; such conical hoops or collars to have their external surface similar to the tube, only with the cones inverted; these in their turn to receive a second layer; this a third layer or any number of layers of hoops required, according to the size of the gun. Hoops *A A' A''*, &c., of the first layer have their internal surfaces made conical, the apexes of these internal cones pointing toward the breech of the gun. Their external surfaces, however, are also made conical, but with their apexes pointing inversely to those of the internal surfaces—that is, toward the muzzle—also, these cones are not continuous for each hoop, but steps or shoulders, as at *b b' b''*, &c., are left on their surfaces. Hoops *B B' B''*, &c., of the second layer have their internal surfaces also made conical, and have recesses *c c' c''* and projections *b b' b''*, &c., the whole to fit and closely embrace the external surfaces of the first layer of hoops, *A A' A''*, &c.; also, their extremities are not immediately over those of the hoops underneath but break joint with them. In order to make the drawing clearer, the slope of the conical surfaces and the steps or shoulders have

been greatly exaggerated. The result of this arrangement is as follows: The pressure of the powder when it explodes tends to blow off the rear of the tube, say, *a*; but by means of this construction the strain is transmitted to hoop A by the wedging action of the conical parts together, and from hoop A to hoop B through the step or shoulder *b*. Hoop B then wedges onto hoop A', A' to B' through step or shoulder *b'*, and so on successively until the whole longitudinal strain is transmitted to the trunnions T T'.

The various operations needed for the construction of the cannon are the following:
 15 First, turning or casting of tube with conical zones terminated by steps or shoulders; second, turning or casting of hoops or collars of the first layer internally to fit surface of tube; third, heating hoops of first layer, so as to
 20 bring them into position, and allowing them to shrink; fourth, turning external surface of conical hoops of the first layer with their apexes inverted with reference to that of the tube, and also leaving steps or shoulders thereon;
 25 fifth, similar operations for each successive

layer until the last, whose external surface is turned smooth.

Having described the nature of my invention, what I desire to secure by Letters Patent of the United States is—

1. The method of strengthening cannons by means of hoops or collars in the shape of truncated cones, both externally and internally, with their apexes pointing opposite ways in two adjacent layers, and also the conical hoops breaking joints, and provided with shoulders or steps, so as to stiffen the gun both longitudinally and transversely, the whole as substantially set forth and described.

2. The combination of an internal tube whose external surface is provided with conical zones and shoulders or steps, as described, with hoops whose internal and external surfaces have conical zones or planes opposite, in successive layers, substantially as set forth.

GILBERT A. CASSAGNES.

Witnesses:

ORAZIO LUGO,
 HÉRREAU.