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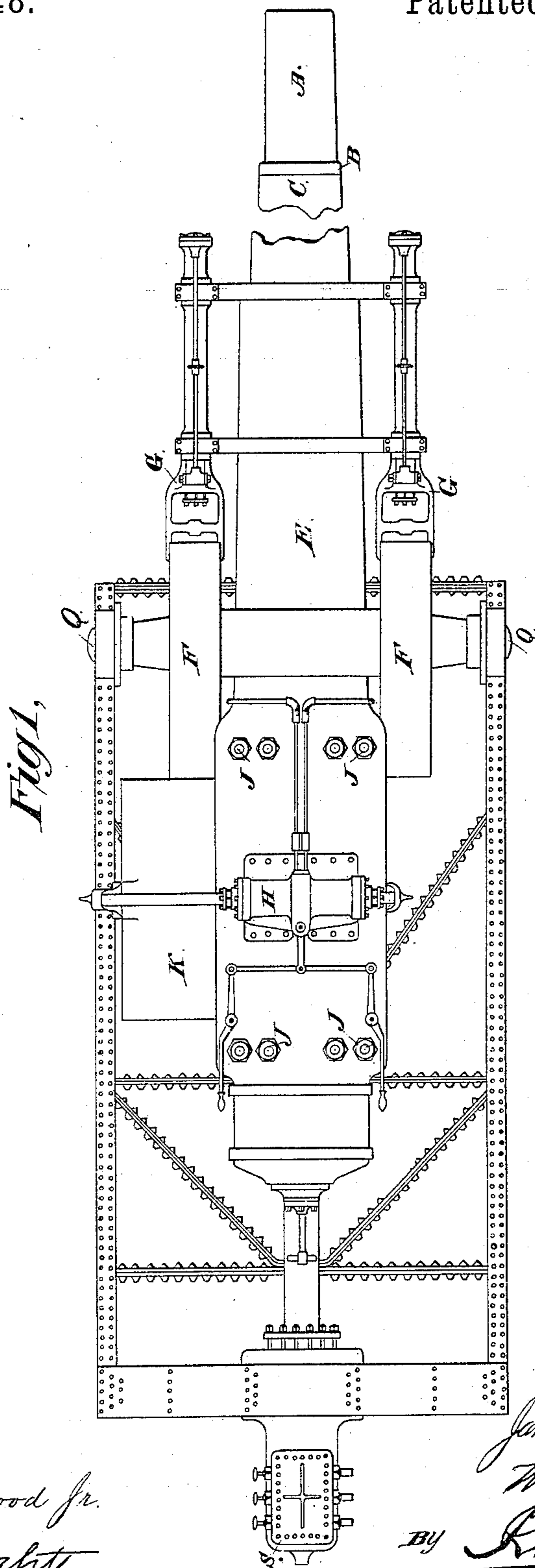
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J. H. McLEAN & M. COLONEY.

BREECH LOADING COMPOSITE GUN.

No. 282,548.

Patented Aug. 7, 1883.



Attest:
Geo. T. Smallwood Jr.
H. E. Knight.

Inventors:
James H. McLean and
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By *Knight Bros*
Attys

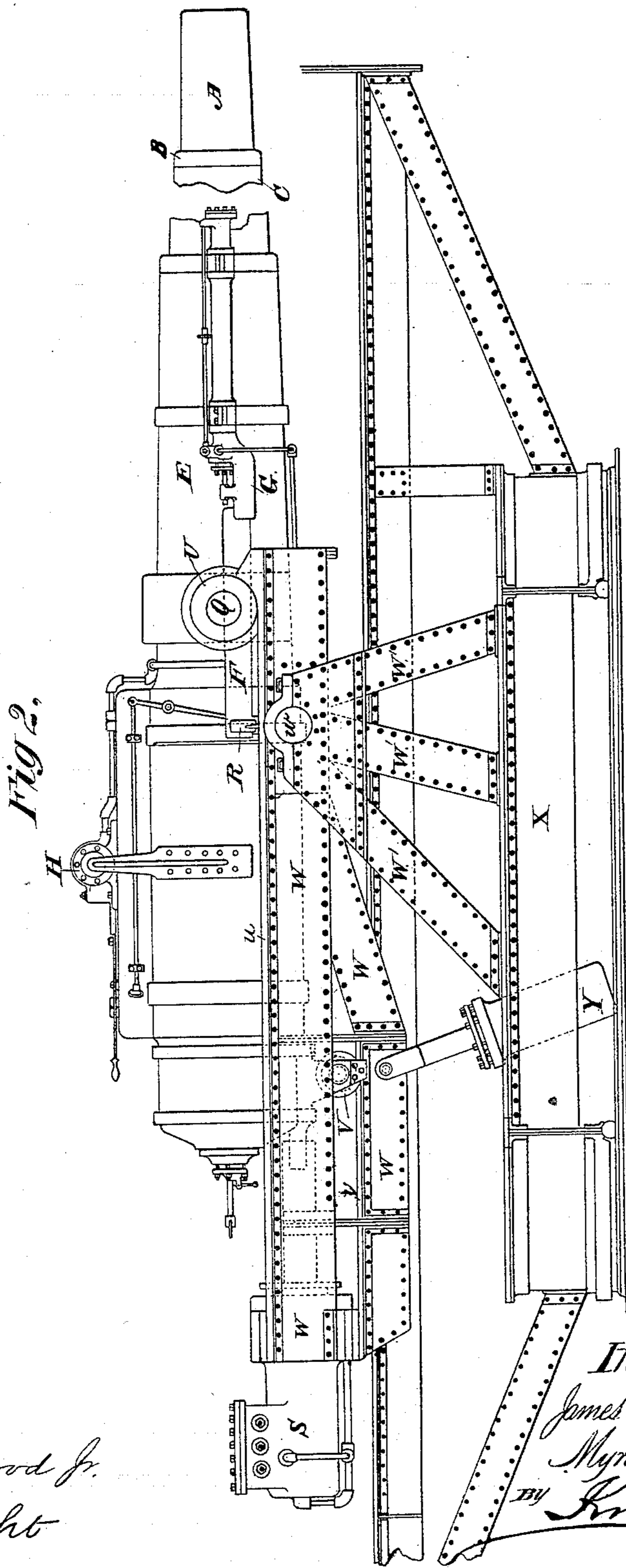
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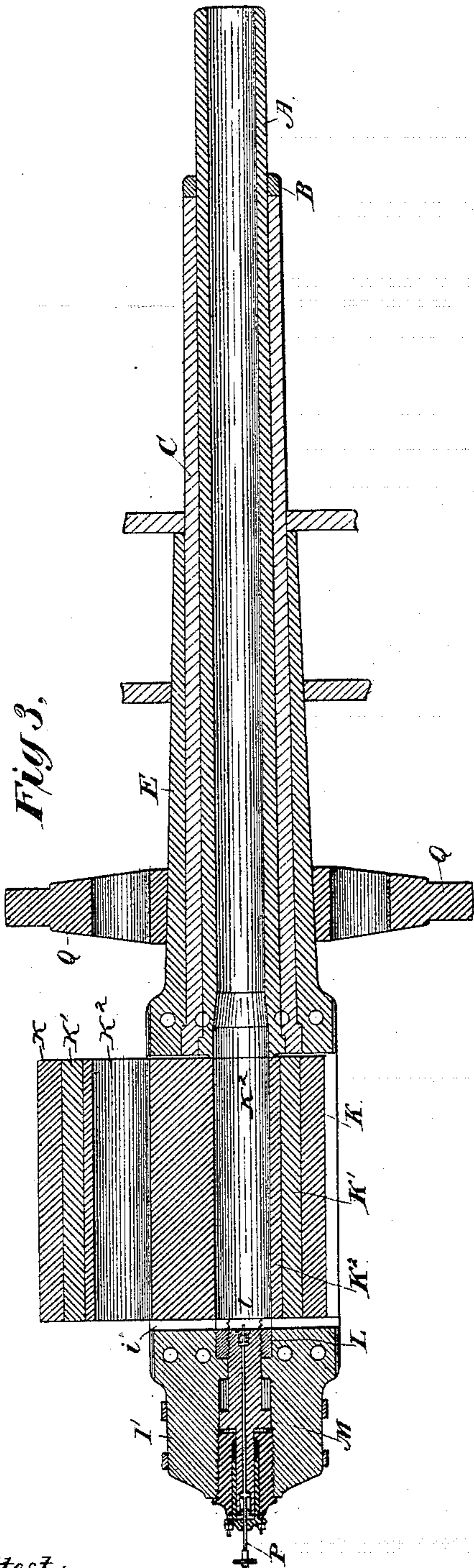
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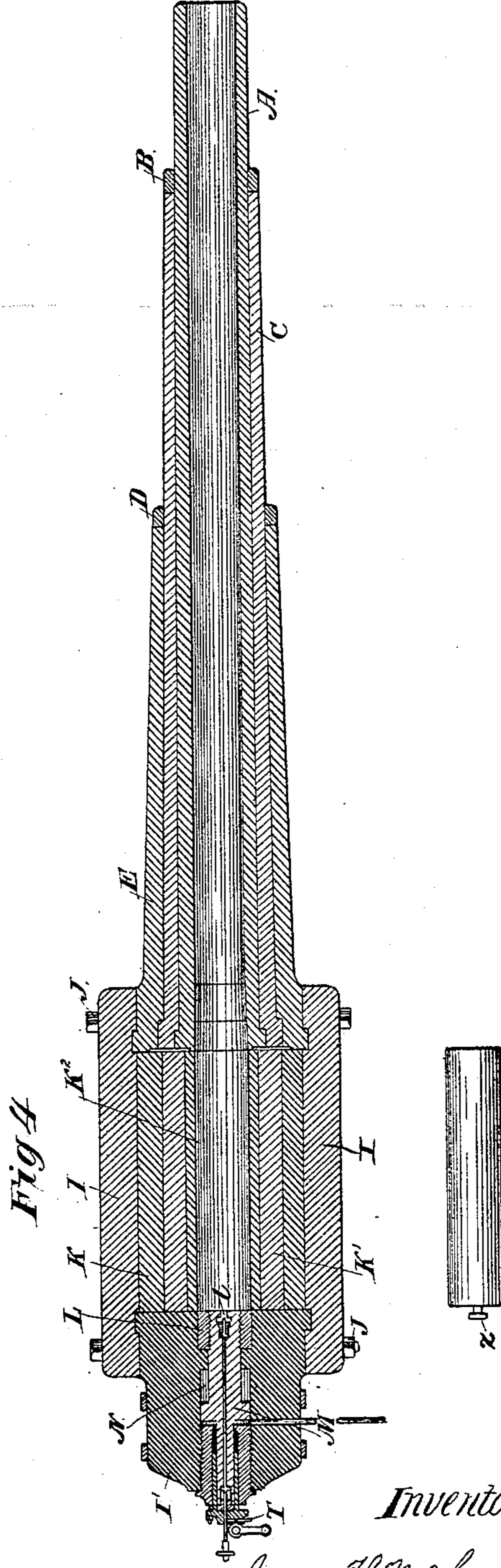
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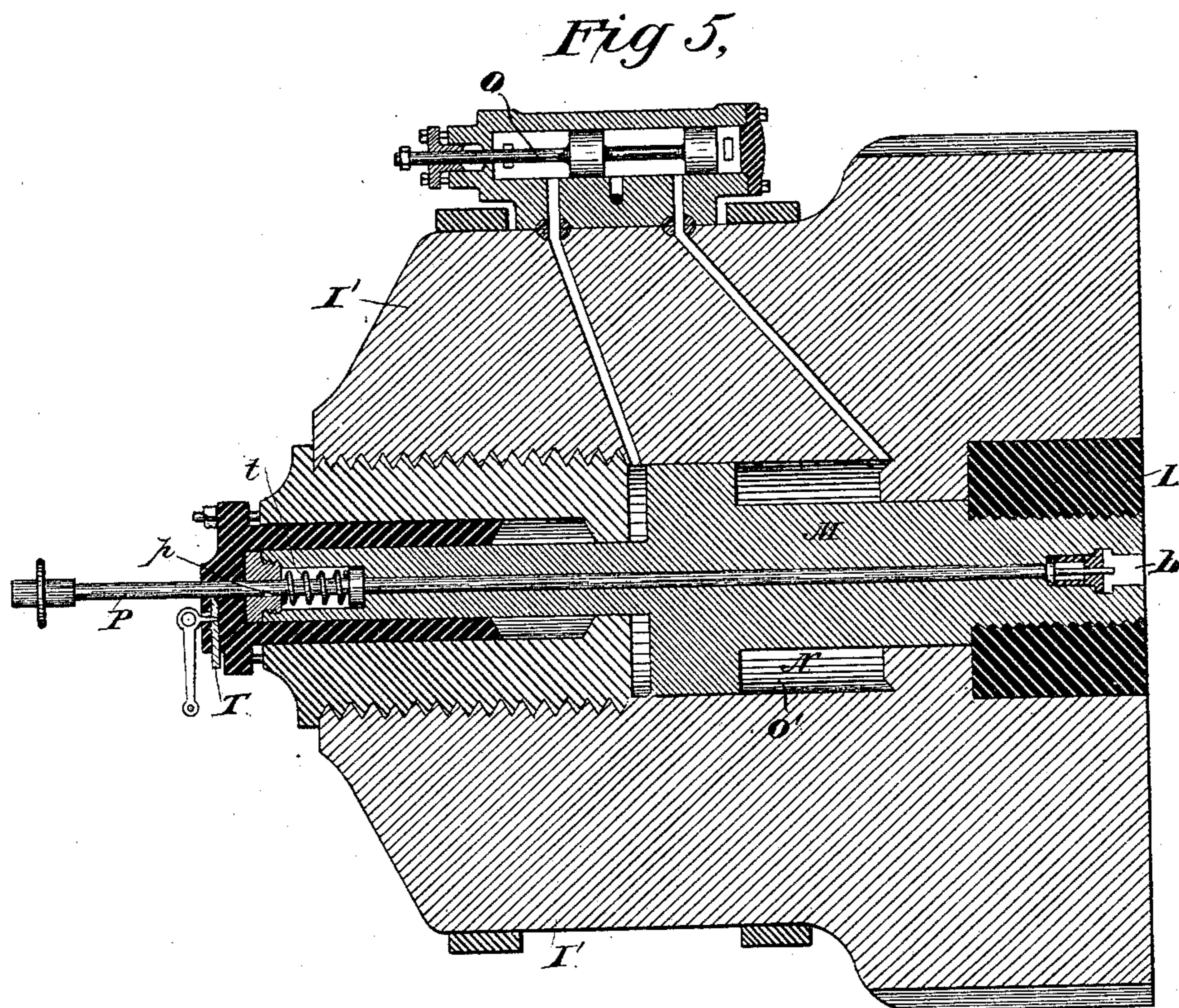
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(No Model.)

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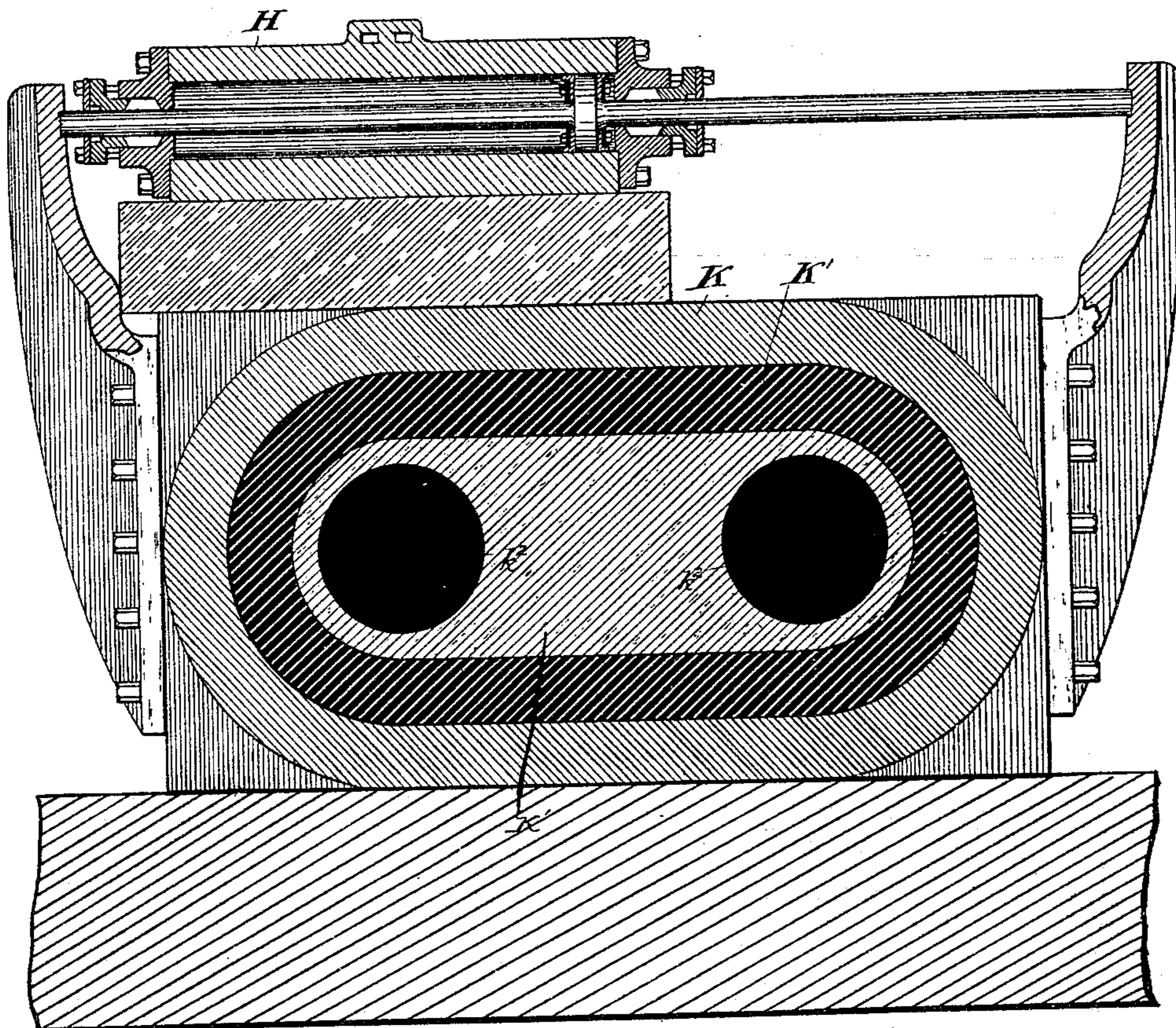
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Fig 6,



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(No Model.)

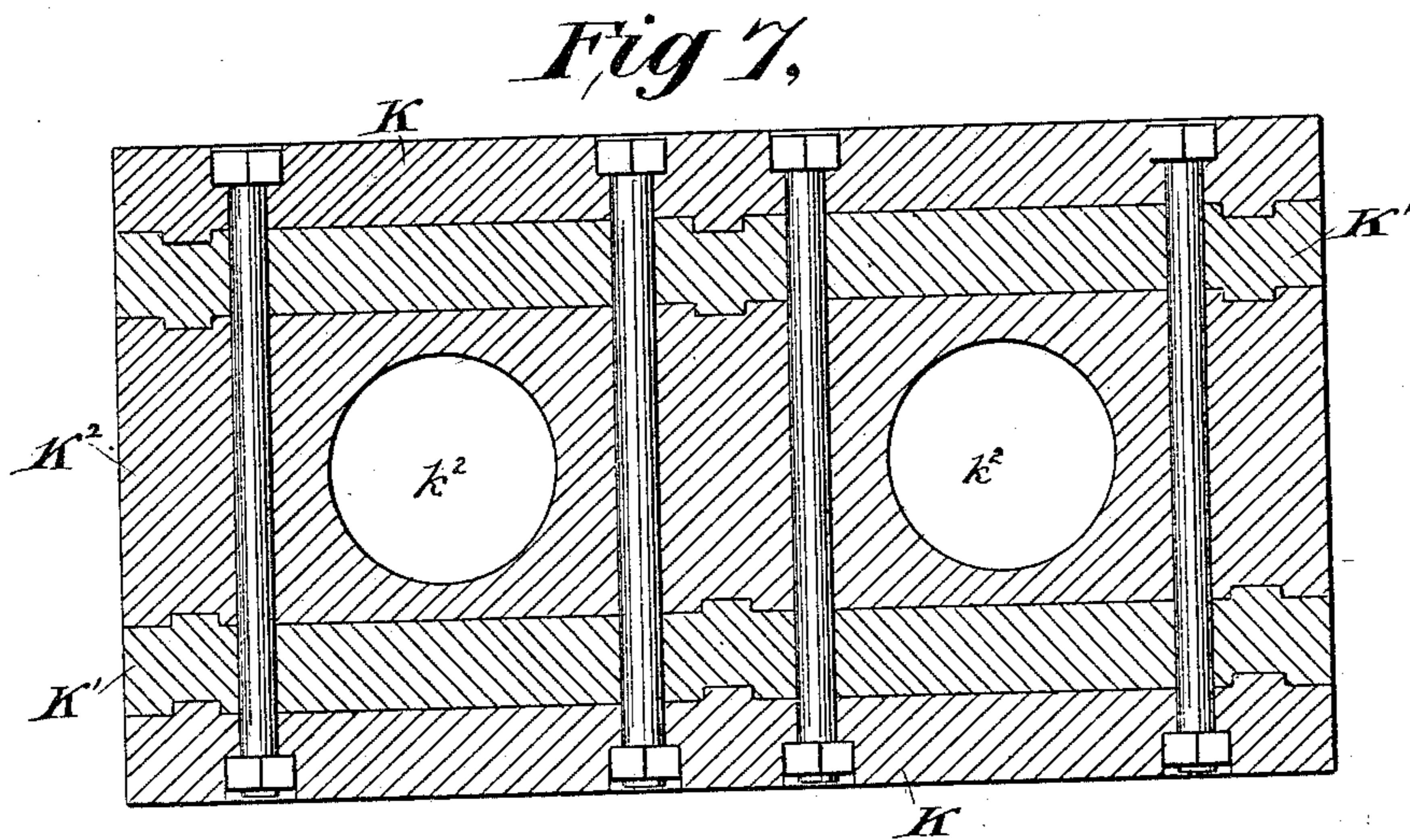
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UNITED STATES PATENT OFFICE.

JAMES H. McLEAN, OF ST. LOUIS, MISSOURI, AND MYRON COLONEY, OF NEW HAVEN, CONNECTICUT; SAID COLONEY ASSIGNOR TO SAID McLEAN.

BREECH-LOADING COMPOSITE GUN.

SPECIFICATION forming part of Letters Patent No. 282,548, dated August 7, 1883.

Application filed October 26, 1880. (No model.)

To all whom it may concern:

Be it known that we, JAMES HENRY McLEAN and MYRON COLONEY, both citizens of the United States, residing, respectively, at St. Louis, Missouri, and New Haven, New Haven county, Connecticut, have invented Improvements in Machine-Guns, of which the following is a specification.

The invention relates to a gun of heavy caliber adapted for use in forts or on war-ships of large size. The barrel is made up of three (more or less) tubes or sections slipped one within another, secured together and to the breech by dovetailed or shouldered joints, and by a band shrunk on each tube in front of the shorter tube, in which it is incased, the simple fitting of the one tube within the other leaving it capable, without strain or violence, of such relative longitudinal movement as may be caused by unequal expansion and contraction. The loading is effected by a transversely-sliding breech-block made up of a number of plates bolted together and having two chambers, one of which is presented externally for the reception of a cartridge, while the other is in position in rear of the bore. In order to provide the transverse chamber or opening required for the chambered breech-slide to move in, the breech of the gun is made in three parts—namely, a casting forming the cascabel or extreme rear part of the gun, containing a recoil-piston and firing-pin, and massive plates forming the top and bottom of the chamber and connecting the cascabel to the composite barrel, engaging over suitable shoulders thereon and securely bolted to both. Hydraulic engines are employed to feed the cartridges in succession from suitable magazines to the slide-chambers, shift the slide alternately in opposite directions, and drive the cartridge partly out of the slide-chamber and within the bore, the engine which performs the last-named duty serving also to take up the recoil and to withdraw the empty shell within the slide-chamber in readiness for the next movement. Hydraulic engines are also employed for elevating and training the gun. This hydraulic mechanism and the supporting-frame are not claimed in this application. We hereby reserve to ourselves the right to embody these features in applications for Letters Patent.

In order that the invention may be fully understood, it will now be described with reference to the accompanying drawings, in which—

Figure 1 is a plan view. Fig. 2 is a side elevation. Fig. 3 is a horizontal section of the gun proper, omitting the carriage. Fig. 4 is a vertical section of the same. Fig. 5 is a partial vertical longitudinal section on a larger scale. Fig. 6 is a transverse section of the breech and breech-slide. Fig. 7 is a section illustrating another mode of putting together the parts of the breech-slide.

The barrel is made of three parts or tubes, A, C, and E, of unequal length, one fitted within another. A ring or band, B, is shrunk on the inner tube, A, after said tube has been slipped within the next tube, B, and in like manner a band, D, is shrunk on the central tube, C, after said tube has been slipped into the outer tube, E. These tubes are made of hammered steel and are exceedingly strong.

The mode of fitting an outer upon an inner tube without shrinking it on, as heretofore practiced, imparts superior strength to the gun, for the reason that while in use expansion by heat occurs first and principally in the inner tube, A, and next in order and degree in the central tube, C, so that when the piece becomes heated, and before any excessive strain can occur, the concentric tubes will be forced into close contact and will sustain the strain with the nearest possible approach to uniformity. This is much better than the mode heretofore practiced of shrinking one tube on another, and thereby placing the fibers of the iron or steel in the outer tube under a severe initial strain while in a cold state. In this construction one effect of the heating of the inner tube, A, in excess of the tube C, in which it is fitted, is to extend the said tube A in length relatively to the tube C, resulting in the opening of a slight crack or seam between the band B and the end of the tube C. This seam is closed again on the cooling of the metal. The same effect occurs between the band D and the end of the tube E. The breech of the gun is made up of separate plates, I I of hammered steel, and a breech-block or casting, I', forming the cascabel or rear part of the breech. The plates I I are fitted, as shown, over shoulders formed to receive them on the barrel E and breech-block I', and are securely fastened

to both by bolts J J, thus giving to the gun in all its parts the required strength to adapt it to resist the heavy longitudinal and transverse strains to which it is subjected in use. The space between the plates I I forms a chamber for the reception of the transversely-moving breech-slide. This is made up of separate plates K K' K², of cast-steel, fitted one within another, as illustrated in Fig. 6, or forged plates K K' K², as illustrated in Fig. 7, bolted together. In either case the central plate, K², is provided with the two parallel chambers k², for receiving the cartridges in succession and conveying them to firing position in rear of the barrel.

By making the parts of the gun of separate plates of steel the avoidance of flaws is insured, and a structure of the greatest possible strength is produced.

F F represent feeding troughs or magazines located on each side of the barrel, supported at one end by the trunnion-plate Q and at the other end by a bracket, R, and employed to contain the cartridges, which are driven backward into the respective slide-chambers by successive strokes of a hydraulic engine, G, after they have been hoisted up into the magazine-troughs.

H is a double-acting hydraulic engine to impart the required reciprocating movement to the breech-slide K.

A breech-engine consisting of a piston, L M N, controlled by a valve, O, is used to force the cartridge forward ten inches (more or less) into the rear of the barrel, so as to form a perfect gas-check between the slide-chamber and breech. The piston-head L fits the slide-chamber, or nearly so, and is attached to the plunger M, the head N of which works in the hydraulic cylinder O'. In the face of the head L is formed a horizontal under-cut or T-groove, l, which opens into a horizontal groove, i, extending across the face of the fixed back I' of the breech, as indicated in Fig. 3. This groove receives a flanged or T-shaped lug, z, projecting from the base of the cartridge, so that the empty shell may be drawn back within the slide-chamber by the reverse movement of the piston L M N after the discharge. The hydraulic engine L M N O may be made to hold the cartridge firmly within the base of the barrel, or to permit any degree of recoil within the slide-chamber which may be desired, to relieve the breech of the gun from undue strain. The rearward movement of the piston L M N, whether effected by hydraulic pressure or by the force of the recoil, carries back with it the firing-pin P, which is held by the trigger T, catching in notch p, in readiness for the next fire.

t is the spring by which the pin P is driven forward when released by the trigger.

The gun is mounted on wheels U V, the latter being mounted on suitable journals beneath the breech, and the former on the trunnions Q Q. The wheels U and V run on track-

rails u and v, respectively. The gun is moved forward on its wheels U V, and the recoil of the entire gun received by a hydraulic engine, S. The frame W, of which the wheels U V form a part, is mounted by secondary trunnions w on cheeks W', mounted on a turn-table, X, for training the gun. The elevation of the gun is effected by a hydraulic engine, Y, mounted on the table X and supporting the frame W at any angle.

The water-pressure for working the hydraulic engines is produced by compressed-air or steam pumps and communicated by pipes in customary or suitable manner. As these details are not new or peculiar, they do not need specific description.

By effecting the entire manipulation of the gun through the medium of hydraulic engines described, controlled by levers, all within reach of the operator, we adapt a gun weighing one hundred and twenty-five tons or more and carrying a projectile of two thousand pounds in weight to be loaded, aimed, and fired by one man with as great ease and facility as a musket.

The following is claimed as new in the above-described invention:

1. In a gun, the combination of a barrel formed with external shoulders at its rear end, and composed of a concentric series of tubes, the central tube being the longest and the exterior tube the shortest, said tubes being joined together by shouldered joints, and by a band shrunk on each tube in front of the shorter tube, within which the longer tube is contained, a cascabel constituting the rear portion of the gun, and provided with external shoulders at its front extremity, and two plates placed one above and the other beneath the gun-barrel and cascabel, and provided each with recesses to receive the shoulders of the cascabel and the barrel, to which parts the plates are bolted, said plates forming the breech-slide chamber.

2. The combination, with the composite barrel, the breech-frame, and the breech-slide, constructed and arranged substantially as herein described, of the cascabel I', secured by shouldered joints to said breech-slide frame, and containing the recoil-piston L M N, provided with the recess l, and also containing the firing-pin P, substantially as and for the purposes specified.

3. The combination, with the cascabel, breech-housing, and barrel, constructed and arranged as herein set forth, of the sliding breech composed of the outer plate, K, intermediate plate, K', and central plate, K², said central plate being provided with a series of load-chambers, k², substantially as set forth.

JAMES HENRY McLEAN.
MYRON COLONEY.

Witnesses:

JNO. G. TAYLOR,
JAS. MILLAN.