

No. 679,115.

Patented July 23, 1901.

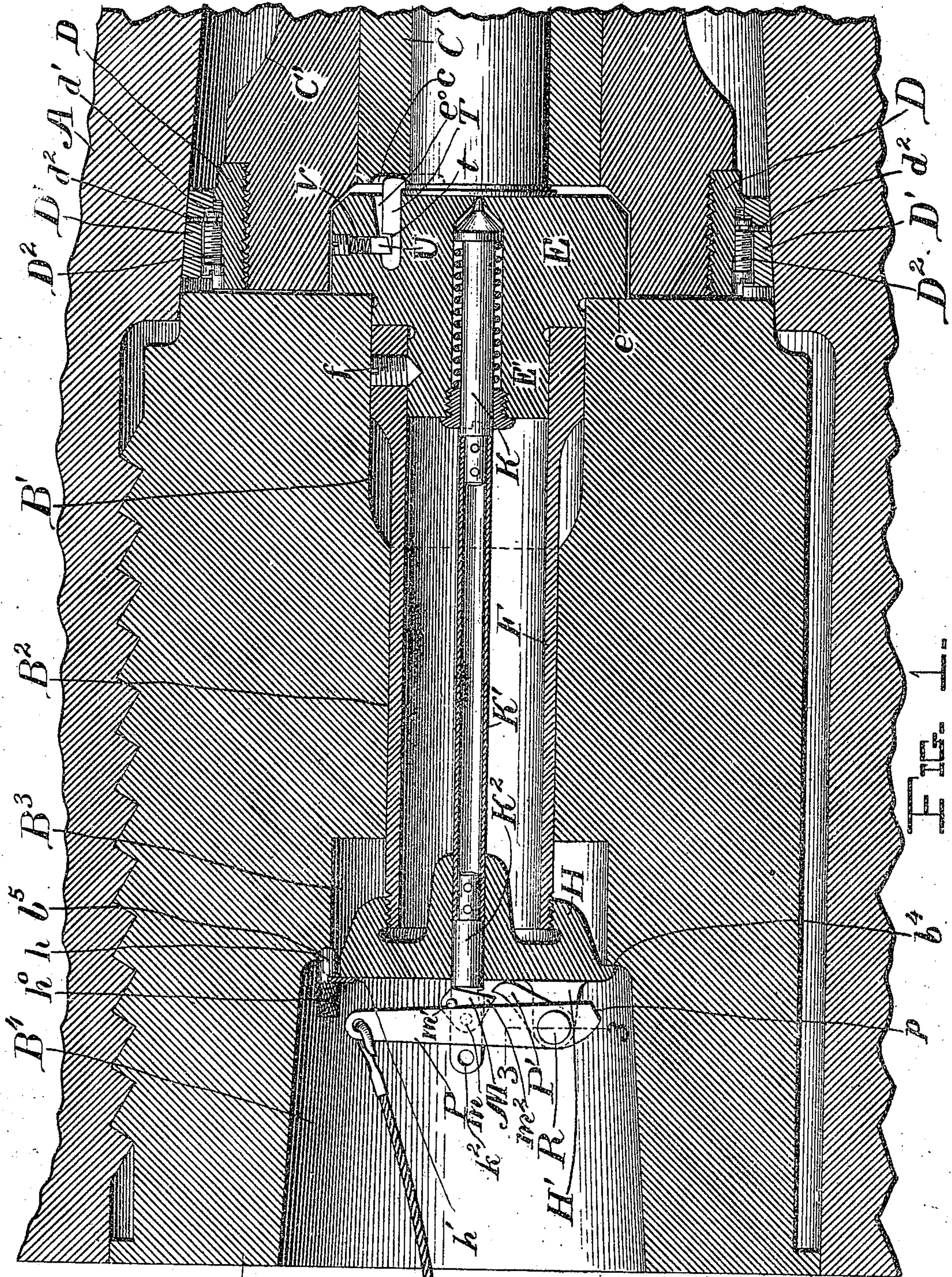
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(No Model.)

(Application filed Dec. 9, 1899. Renewed Feb. 12, 1901.)

2 Sheets—Sheet 1.



Witnesses

Percy C. Bowers.

Clarence A. Bateman.

Inventor
Louis C. Driggs,
by Wilkinson & Fisher,
Attorneys.

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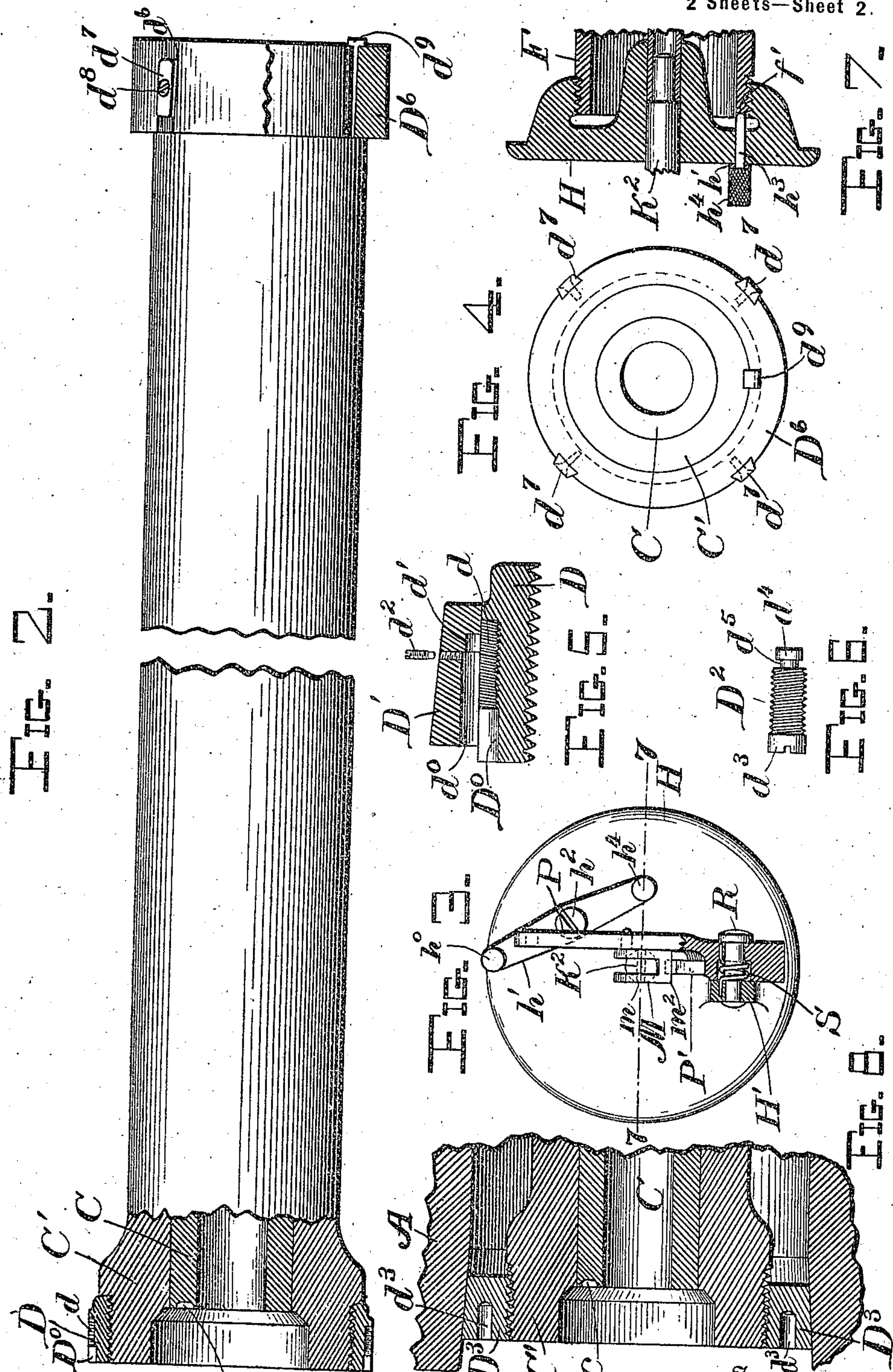
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Witnesses
Percy C. Bowen
Clarence A. Bateman

Inventor
Louis L. Driggs
by Wilkinson & Fisher,
Attorneys

UNITED STATES PATENT OFFICE.

LOUIS L. DRIGGS, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO WILLIAM H. DRIGGS, OF WASHINGTON, DISTRICT OF COLUMBIA.

SUBCALIBER MECHANISM FOR BREECH-LOADING RIFLES.

SPECIFICATION forming part of Letters Patent No. 679,115, dated July 23, 1901.

Application filed December 9, 1899. Renewed February 12, 1901. Serial No. 47,050. (No model.)

To all whom it may concern:

Be it known that I, LOUIS L. DRIGGS, a citizen of the United States, residing at New York, in the borough of Manhattan and State of New York, have invented certain new and useful Improvements in Subcaliber Mechanism for Breech-Loading Rifles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in subcaliber devices for breech-loading guns; and it consists in a subcaliber-barrel with means for securing the same in the gun and mechanism for closing said barrel and for firing the cartridge carried by the breech-block of the gun.

It also consists in certain novel details of construction and combinations and arrangements of parts, that will be hereinafter more fully described and claimed.

Figure 1 represents a section through the breech-block and a part of the breech of the gun, showing the subcaliber device. Fig. 2 represents an elevation, partly broken away, of the subcaliber-barrel adapted to be inserted in the bore of the gun with the rear outer adjusting-ring removed. Fig. 3 represents a rear view of the screw-cap carrying the firing attachment. Fig. 4 represents a front view of the barrel of the gun, showing the centering-ring and lugs for holding the same against turning. Fig. 5 is a detail view showing the means of adjusting the rear end of the subcaliber-barrel in the powder-chamber of the gun. Fig. 6 is an elevation of the adjusting-screw. Fig. 7 is a section through the screw-cap, taken along the line 7 7 of Fig. 3. Fig. 8 shows a section of a modified form of adjusting-ring for the barrel.

A represents the body of the gun, preferably constructed in the usual way—such, for instance, as shown in the patent to Fletcher, No. 499,531.

The breech-block B engaging in the screw-box is of the ordinary type—such, for instance, as is shown in the Letters Patent of Fletcher aforesaid—and has the usual slotted screw engagement. The breech-block is hollowed out, as at B', B², B³, and B⁴, to re-

ceive the mushroom gas-check and firing mechanism carried thereby, which gas-check and attached parts are removed and the hereinafter-described subcaliber attachments are placed in the breech-block in lieu thereof.

C represents the inner tube of the subcaliber-barrel and is surrounded by an outer tube C', although the tubes may be made in one, if desired, and outside of the outer tube C' are secured the centering-bands D and D⁶. The two bands D and D' may be made in one, if desired, and arranged to fit snugly in the obturator slope of the powder-chamber; but I prefer to have means for adjusting the fit of the rear end of the subcaliber-barrel in the powder-chamber and have provided for this purpose the adjusting devices shown in Figs. 1, 2, 5, and 6. In these figures the band D is screwed to the gun, the screw-threads being so arranged that the rifling in the subcaliber-barrel will tend to cause said threads to screw tighter as the gun is fired. The outside of this band is mainly cylindrical, and in the cylindrical portion of the outer surface I provide a plurality of recesses D⁰, slightly enlarged in their rear portions to receive the heads d³ of the adjusting-screws D², while the forward part of these recesses is screw-threaded, as at d, to engage the screw-threads of the adjusting-screw. Thus the adjusting-screw has some little travel in the recess D⁰ before its head either projects beyond the rear of the ring D or brings up against the shoulder at the rear end of the screw-threads. The front end of the adjusting-screw is somewhat reduced in diameter and terminates in the cylindrical button in front of the annular groove d⁵. The adjusting-ring D' fits snugly over the ring D, but is free to travel longitudinally thereon. The inner surface of this ring D' is provided with recesses d⁰, each adapted to receive the head of the adjusting-screw D², but to be clear of the screw-threads on said screw, while the forward portion of the recess d⁰ is reduced, as at d', to receive the button d⁴. A pin d² is screwed in from the exterior of the ring D' to engage in the annular groove d⁵ of the adjusting-screw D². The exterior of the ring D' is made tapering, as shown, to fit the tapering portion of the powder-chamber. It will be evident that by set-

ting up on the adjusting-screws D^2 the adjusting-ring D' will be moved forward on the ring D until the adjusting-ring fits snugly in the powder-chamber, while easing up on these
 5 adjusting-screws will move the adjusting-ring to the rear on the ring D , allowing the subcaliber-barrel to be readily withdrawn from the gun. The front band D^6 is provided with a plurality of lugs d^7 , secured
 10 thereto, as by means of the grooves d^6 and screws d^8 , which lugs pass into the rifle-grooves and hold the subcaliber-barrel against turning in the gun, due to the reaction of the projectile on the subcaliber rifle-grooves when
 15 the subcaliber device is fired. Other means for holding the subcaliber barrel against rotation may be adopted, if desired. This band D^6 may be either shrunk on the outer tube C' or may be keyed thereon, as by means of
 20 the key d^9 . By means of these two bands D' and D^6 the subcaliber-barrel is centered in the bore of the gun and the projectile of the subcaliber-barrel follows the same path that the larger projectile would follow.

25 Instead of the fixed ring D and sliding ring D' , I may use a single slightly-tapered adjusting ring or band D^3 , screwed on the breech of the jacket C' of the subcaliber-barrel C ; as shown in Fig. 8. In this case the tapered
 30 portion of the adjusting-ring D^3 fits in the rear slope of the powder-chamber of the gun and is adjusted by means of a spanner engaging in the spanner-holes d^3 .

The breech of the subcaliber-barrel is closed
 35 by means of the block E , which is shouldered, as at e , and bears against the face of the service breech-block B . This block E is provided with a rearwardly-extending stem E' , which projects into the sleeve F , which sleeve is keyed
 40 fast to the block E , as by means of the set-screw f . Over the rear end of the sleeve a screw-cap H is screwed, having shoulders which bear against the shoulders b^4 of the service breech-block.

45 In order to hold the subcaliber breech-block against turning in the breech-block proper of the gun, I provide a plunger-pin h , having a knurled head h^0 for convenience in drawing same to rear, and secured to the plate-spring
 50 h' at its center, as at h^2 , to the rear face of the plate H . This pin h engages in a groove cut in the rim of the plate H and projects into a recess or socket b^5 in the shoulder b^4 of the main breech-block. A similar pin h^3 is
 55 secured to the opposite end of the plate-spring h' and passes through an opening in the plate H , extending into a recess f' in the end of the sleeve F , as shown in Fig. 8, to prevent the screw-cap H from turning on the screw-
 60 threads of the sleeve F . This pin h^3 is also provided with a knurled head h^4 , by means of which it may be withdrawn when necessary. The resiliency of the spring h' should be sufficient to allow the pins h and h^3 to be
 65 drawn to the rear to clear the rear face of the plate H , and then swinging the spring h' slightly about its pivot will allow the points

of the pins to rest on the rear face of the plate H out of engagement with the sockets b^5 and f' until the plate H is screwed home, when
 70 the pins are snapped into the recesses in the plate H and the latter is turned, the points of the pins meantime bearing against the shoulder b^4 until the pins snap into the sockets b^5 and f' , and the subcaliber-block is then
 75 held against turning in the main breech-block. It may not always be necessary, however, to lock this subcaliber-block against rotation, especially where metal cartridge-cases are not used. Projecting through this cap
 80 H is the stem K^2 , made fast to the sleeve K' , secured to the tail of the firing-pin K , the latter being of the ordinary type of spring-operated firing-pin and projecting through the block E , as shown in Fig. 1. The rear
 85 end of this stem K^2 projects between the arms of the yoke M , which is pivoted, as at m , to the said stem, and is provided with a stud or projection m' and with a heel m^2 . A single plate may be substituted for the yoke M , if
 90 desired.

P represents a trigger or firing-arm operated either by hand or preferably by means of the lanyard Q , which is pivoted on the pin R and has a shorter cocking-arm P' project-
 95 ing therefrom and engaging the heel m^2 of the pivoted yoke M . Surrounding part of this pin R is a spring S , which normally tends to throw the firing-arm P forward and to restore the same automatically to the initial po-
 100 sition each time the gun has been fired. As the cocking-arm P' is thrown forward it tilts the heel m^2 and passes beyond the same, and then the arm P , engaging the lug m' , swings the yoke M forward until its front face strikes
 105 against the shoulder k on the stem K^2 , and thus the parts are normally held in the position shown in Fig. 1.

If it is desired to fire the subcaliber device by pulling back on the lanyard, the cocking-
 110 arm P' will drag the stem E^2 backward until the said arm passes beneath the heel m^2 , when the firing-pin will be released and will fly forward under the operation of the spring, firing the cartridge. The short arm p is arranged
 115 to bring up against the rear face of the plate H when the firing-arm is drawn far enough to the rear to release the firing-pin, and thus excess of lost motion and excessive strain on the spring S is avoided.

As an additional means for firing the gun the stem K^2 is provided with an eye k^2 , into which the lanyard may be hooked directly, and the firing-pin may be drawn back and then let go, if desired.

125 In order to remove the empty cartridge-cases, I provide the extractor T , notched, as at t , to engage the inclined face of the spring-catch U , which is normally pressed inward by means of the spring W . The extractor is
 130 mounted in the slot e^0 in the front face of the block E , and the head of the extractor passes into the arc-shaped recess c of the inner tube C , while the nib of the extractor engages the

rim of the cartridge-case, as shown in Fig. 1. There may be two or more of these extractors, if desired, and other well-known forms of extractors may be adopted, if preferred.

5 In order to fit the gun with the subcaliber mechanism, the obturator and connected parts are first removed from the breech-block, which is swung open, the subcaliber-barrel is inserted from the rear of the breech of the
10 gun, the lugs *d* taking in the grooves of the rifling, and the said subcaliber-barrel is shoved in place, the rear end being centered by the ring *D'* and adjusting-screws *D''*, as before described. The block *E* and sleeve *F* are in-
15 serted from the front face of the breech-block, and the screw-cap *H* is screwed on from the rear. It will be obvious that in mounting the block *E* in the breech-block that the said block *E* should be turned so that the head of the
20 extractor will register with the end of the arc-shaped recess *c* in the rear end of the barrel *C*. The parts now being in the position shown in Fig. 1, the breech-block is opened and closed in the ordinary way, and the subcali-
25 ber ammunition is placed in the barrel *C* from the rear just as the full-sized service ammunition is loaded.

By the herein-described arrangement it is rendered possible to secure high efficiency in
30 subcaliber practice and to have it simulate as nearly as possible the actual service practice. The design permits the introduction of subcaliber mechanism with no cutting or alteration of the gun whatever, except, possi-
35 bly, the slight cutting incident to providing the stop-notch *b''*, and even this may not be necessary. The only work required to prepare the gun to receive the subcaliber mechanism is the removal of the obturator and
40 connections. As the design permits of the use of the service breech-block, the gun's crew has the benefit of practice with the mechanism in the same manner as in firing full charges.

45 As target practice with service charges is held but seldom and it is generally desired to have frequent target practice with the subcaliber ammunition, the subcaliber device need only be removed a few times per year
50 when practice with service charges is held. Under these conditions the large subcaliber-tube would not be too unwieldy.

The advantages of being able to use a comparatively heavy and yet not too expensive a
55 projectile in subcaliber practice are too obvious to be dwelt upon.

It will be obvious that various modifications might be made in the herein-described apparatus which could be used without departing from the spirit of my invention. 60

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. A subcaliber-barrel for use in breech-loading guns, provided with a band, with lugs 65 thereon near the forward end of said barrel, and a sloping centering-band at the rear end of the barrel adapted to fit in the obturator slope of the bore of the gun and to center the said barrel in the said gun, in combination 70 with means for closing said barrel and for firing the subcaliber device; substantially as described.

2. A subcaliber-barrel for use in breech-loading guns, provided with a band, with lugs 75 thereon at the forward end of said barrel, and a sloping centering-band at the rear end of the barrel adapted to fit in the obturator slope of the bore of the gun and to center the said barrel in the said gun, in combination with 80 a subcaliber breech-block mounted in the breech-block of the gun and firing mechanism carried by said subcaliber breech-block; substantially as described.

3. A subcaliber-barrel for use in breech-loading guns, provided with a centering de- 85 vice near the forward end of said barrel, and an adjustable sloping centering-band at the rear end of the barrel adapted to fit in the obturator slope of the bore of the gun and to 90 center the said barrel in the said gun, in combination with means for closing said barrel and for firing the subcaliber device; substantially as described.

4. A subcaliber-barrel for use in breech-loading guns, provided with a centering de- 95 vice near the forward end of said barrel, and an adjustable sloping centering-band at the rear end of the barrel adapted to fit in the obturator slope of the bore of the gun and to 100 center the said barrel in the said gun, in combination with a subcaliber breech-block mounted in the breech-block of the gun, and firing mechanism carried by said subcaliber breech-block; substantially as described. 105

In testimony whereof I affix my signature in presence of two witnesses.

LOUIS L. DRIGGS.

Witnesses:

ALBERT W. HOWE,
L. J. ELIOT.