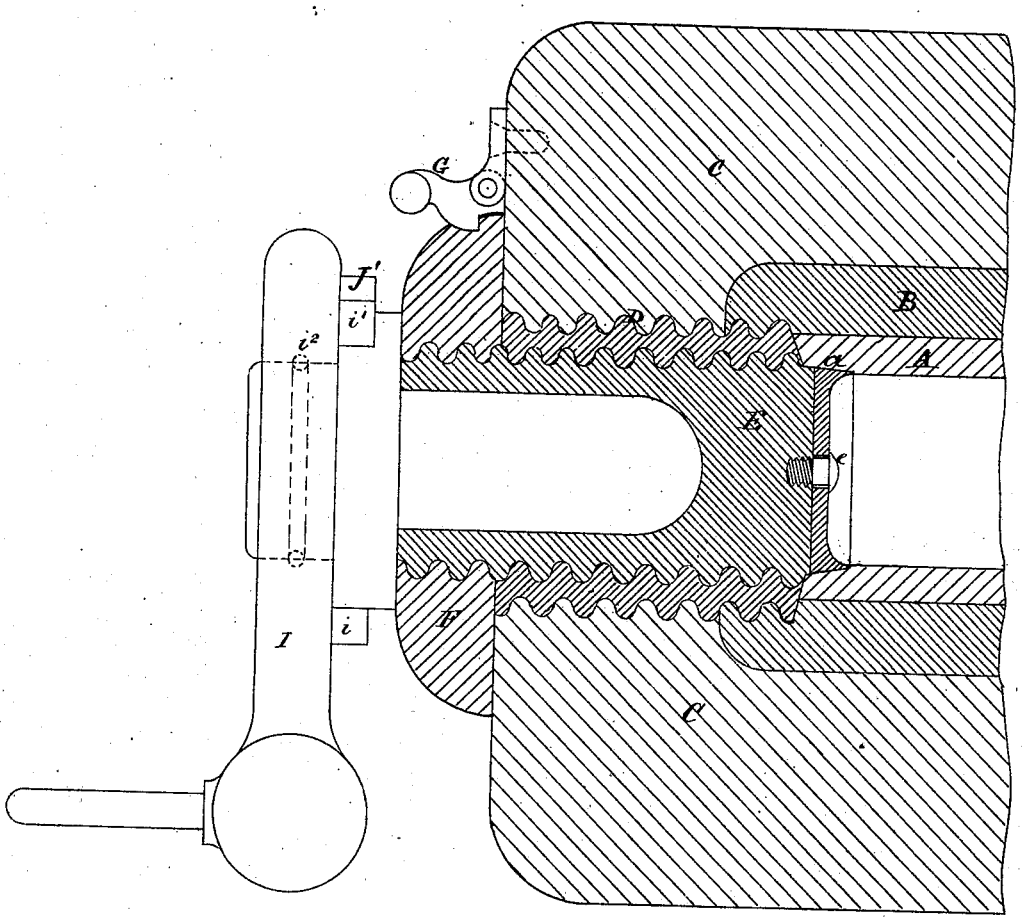
3 Sheets—Sheet 1.

# W. PALLISER.

## Breech-Loading Ordnance.

No. 197,168. Patented Nov. 13, 1877.

FIG. 1

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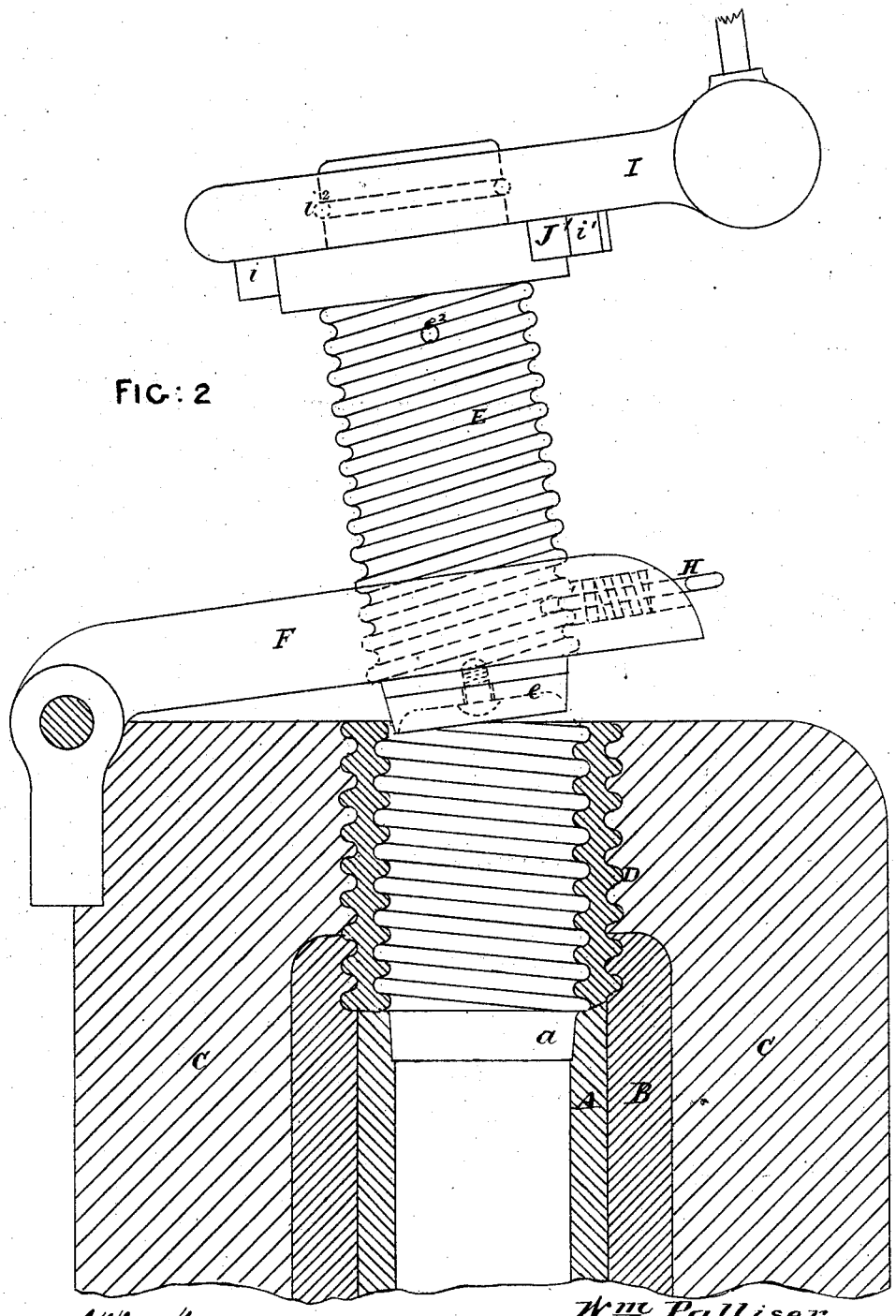
# W. PALLISER.

## Breech-Loading Ordnance.

No. 197,168. Patented Nov. 13, 1877.

FIG: 2

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3 Sheets—Sheet 3.

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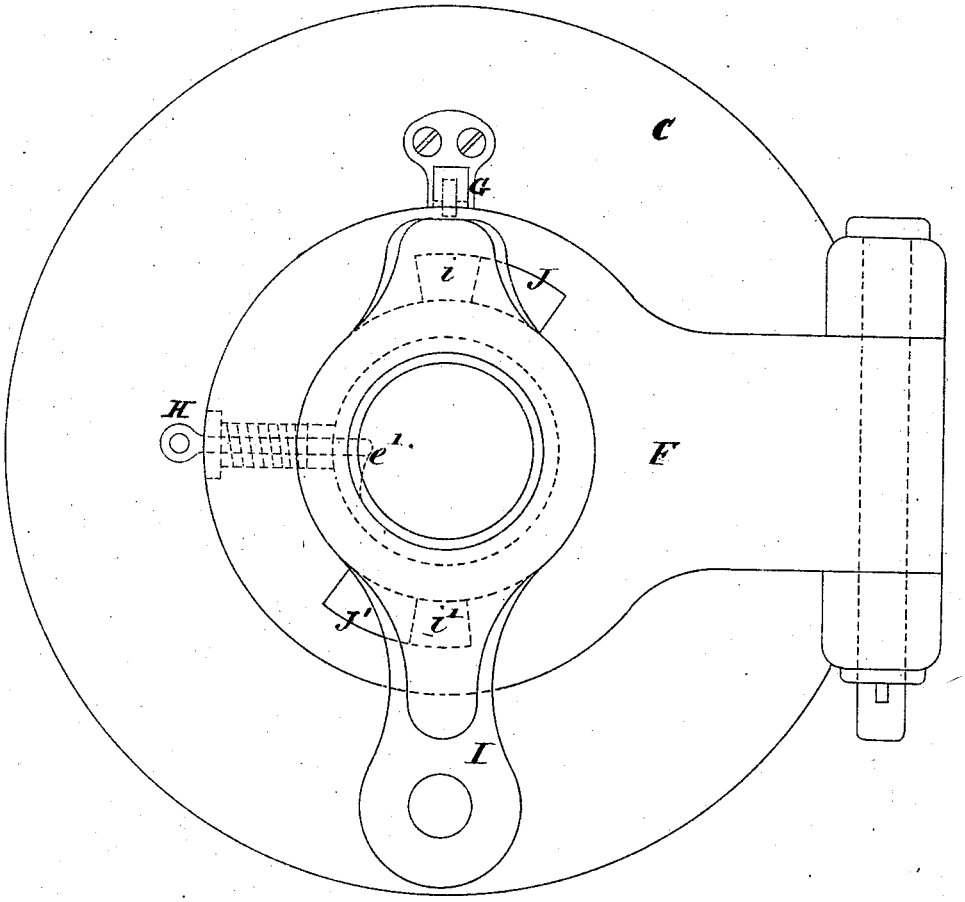
## Breech-Loading Ordnance.

No. 197,168. Patented Nov. 13, 1877.

FIG: 3

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# UNITED STATES PATENT OFFICE.

WILLIAM PALLISER, OF LONDON, ENGLAND.

## IMPROVEMENT IN BREECH-LOADING ORDNANCE.

Specification forming part of Letters Patent No. **197,168**, dated November 13, 1877; application filed October 15, 1877.

*To all whom it may concern:*

Be it known that I, WILLIAM PALLISER, of No. 19 Earl's Court Square, London, in the county of Middlesex, England, knight, have invented an Improvement in Breech-Loading Ordnance; and do hereby declare that the following description, taken in connection with the accompanying drawings hereinafter referred to, forms a full and exact specification of the same, wherein I have set forth the nature and principles of my said improvement, by which my invention may be distinguished from others of a similar class, together with such parts as I claim and desire to secure by Letters Patent—that is to say:

My invention relates to a method of constructing the breech apparatus of breech-loading guns so as to afford an easily-worked, reliable, and tight means of closing the breech for the discharge of the gun, with facility of opening the breech for charging it, and ability to resist great strain in discharging; and the construction which I will describe for this purpose is applicable either in constructing guns as breech-loaders or in converting muzzle-loaders into breech-loaders, and enables the gun to be used as a muzzle-loader as well, whether the guns be of cast or wrought iron or of other metal, or whether they be lined in the manner described in the specification of a United States patent granted to me on the 29th June, 1869, No. 91,864.

The accompanying drawings represent breech apparatus constructed according to my invention.

Figure 1 is a longitudinal section of part of the breech end of a gun with the breech-plug in position for firing. Fig. 2 is a sectional plan of part of the breech end of a gun with the plug withdrawn and ready to be turned aside for charging. Fig. 3 is an end view of the breech.

In these figures, C is part of the body of the gun, which may be lined with A and B tubes, as shown according to my previous invention. In the center of the breech I bore a hole somewhat larger than the bore of the gun, and tap it with a rapid internal screw of several threads, for the reception of a screwed breech-plug, E. For guns of cast-iron or any metal other than steel, I prefer to introduce in the breech-hole a steel bush, D, screwed into the metal of the breech, in order to secure greater strength and durability in the working parts. For guns lined as shown, I make this bush to screw also into the B lining-tube, so as to throw upon that tube as well as on the breech metal of the gun the strain of the explosion on firing. I form the screw-threads of the breech-plug, bush, and lining with curved faces, as shown, whereby end strain upon these parts is distributed evenly over their entire threaded surfaces, and abrupt shoulders and sharp corners liable to easy fracture are avoided.

The breech-plug E, which is preferably of steel, being of larger diameter than the bore of the gun, is made with an end coned to fit a coned seating at *a*, where the charging-hole meets the bore, and it may be provided with any known form of gas-check, such as *e*, secured thereto by a central pin, which gas-check, being expanded on firing, closes the breech-opening against the escape of the gases resulting from the explosion. I do not, however, claim such gas-check as part of my present invention. The plug E, having screw-threads cut on it to suit the rapid threads of the breech-hole, is screwed through a collar, F, which is hinged to the breech of the gun. In this collar is fitted a sliding pin, H, pressed by a spring against the surface of the plug E. In that surface are provided two shallow holes, $e^1$ and $e^2$, into which the point of the pin H can enter. The former hole, $e^1$, near the front of the plug, is entered by the pin H, when the plug is unscrewed sufficiently far to permit of its being folded back along with the collar F, the pin in that case acting as a stop to prevent the plug E from being further unscrewed. One side of the hole $e^1$ is sloped off, as shown in Fig. 3, to allow of the plug E being screwed up when the point of the pin H is in the hole $e^1$. The other hole, $e^2$, near the back end of the plug, admits the pin H when the plug is screwed up, the pin in that case serving as a stop to prevent the plug from being unscrewed by the force of the explosion. In order to unscrew the plug after discharge, the pin H has to be withdrawn from the hole $e^2$. A drop-latch, G, mounted on the breech of the gun, catches in a notch provided at the edge of the collar F, and holds the collar close to

the breech when the plug is about to be screwed in, but this latch yields to a pull when the collar and plug are to be folded back, so as to leave the breech-hole free for charging. On the end of the plug E is mounted a tappet-lever handle, I, of known kind, free to turn on the plug, and held thereon by pins $i^2$, working in a groove in the plug. The handle is provided with striking-pieces $i$ $i^1$, meeting stops J on the plug, so that the plug can be slacked for unscrewing, or tightened up when it is screwed in, by delivering a blow from the handle I through the striking-pieces $i$ $i^1$ being brought rapidly against the the stops J.

The operation of the apparatus will be readily understood on reference to the drawings—that is to say, for charging the gun, the plug E is screwed back, as shown in Fig. 2, and, along with the hinged collar F, is folded away from the breech, so as to leave the breech-hole free for the insertion of the charge. The collar F is then folded back against the breech of the gun, the latch G catching and holding it there, whereupon the plug E is screwed forward till its coned end bears against the coned seating of the bore, the pin H at the same time entering the hole $e^2$, so as to prevent the plug E from unscrewing. The gun having been discharged, the pin H is withdrawn by hand, the plug E is unscrewed, and the collar F withdrawn, whereupon the gun can be charged again. It is obvious that by retaining the plug E screwed up the gun can be used as a muzzle-loader.

Having thus described the nature of my invention, and the best means I know of carrying the same into practical effect, I claim as my invention, with respect to breech-loading apparatus for ordnance—

1. The combination of the screwed steel bush of the charging-hole with the gun-lining, having a rear screwed portion, and arranged to engage with said bush, as and for the purpose set forth.

2. The combination of the screwed plug E with the hinged collar F, latch G, and spring-pin H, substantially in the manner and for the purposes herein set forth.

3. In a breech-loading cannon, the combination of a charging-hole having a greater diameter than the bore of the gun, and provided with a curved-face screw-thread, with a breech-plug having a screw-thread of corresponding conformation.

4. In a breech-loading cannon, the combination of the steel bush of the charging-hole and the breech-plug, said steel bush being provided, both externally and internally, with curved or rounded faced screw-threads adapted for engaging with screw-threads of corresponding shape in the charging-hole and in the breech-plug.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses this 28th day of September, 1877.

WILLIAM PALLISER.

Witnesses:

JNO. P. M. MILLARD,

CHAS. BERKLEY HARRIS.