

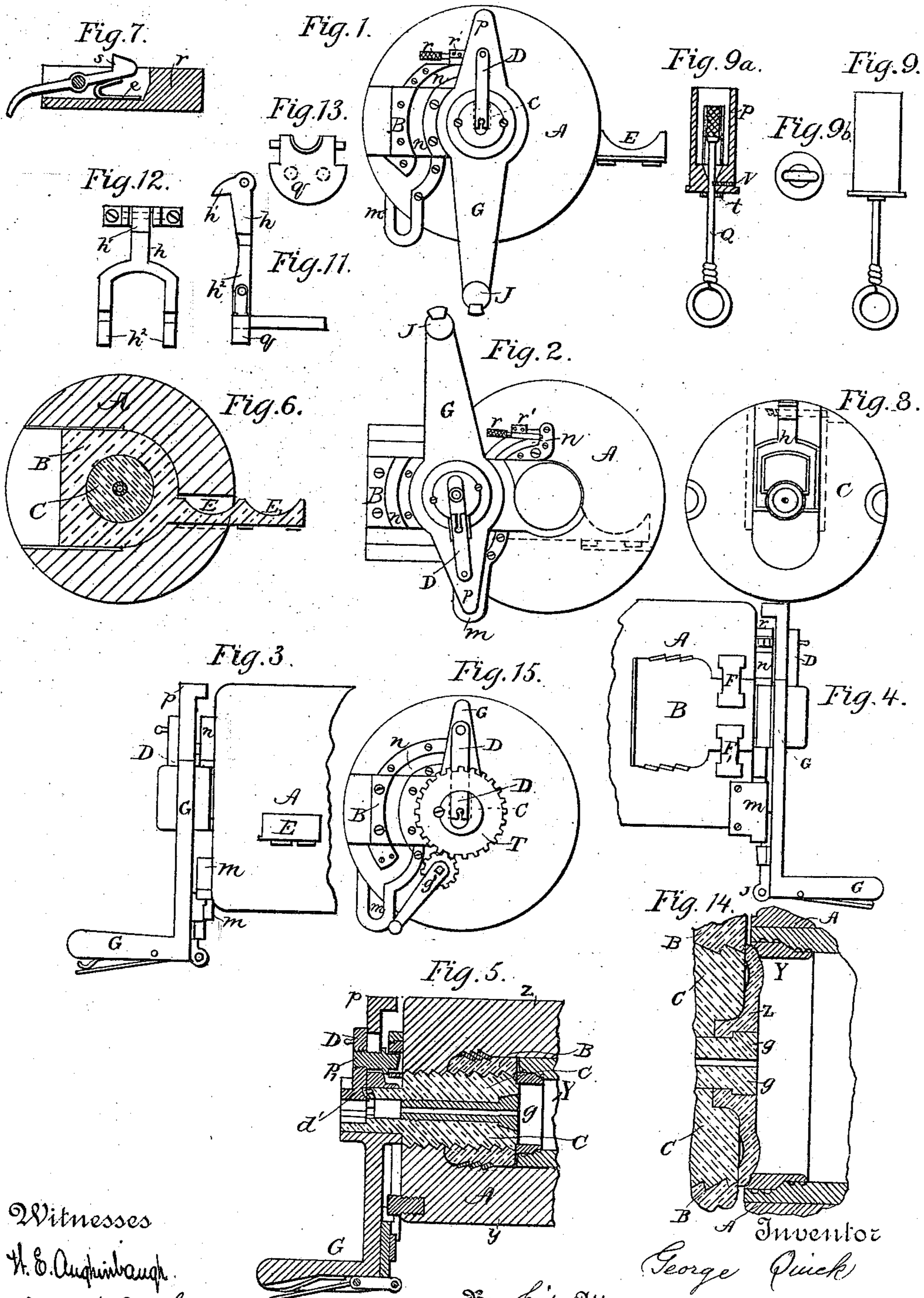
(No Model.)

4 Sheets—Sheet 1.

G. QUICK.  
LOCK FOR BREECH LOADING ORDNANCE.

No. 324,272.

Patented Aug. 11, 1885.



Witnesses  
H. E. Aughinbaugh  
Jas. H. McLaughlin

Inventor  
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(No Model.)

4 Sheets—Sheet 2.

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Fig. 10.

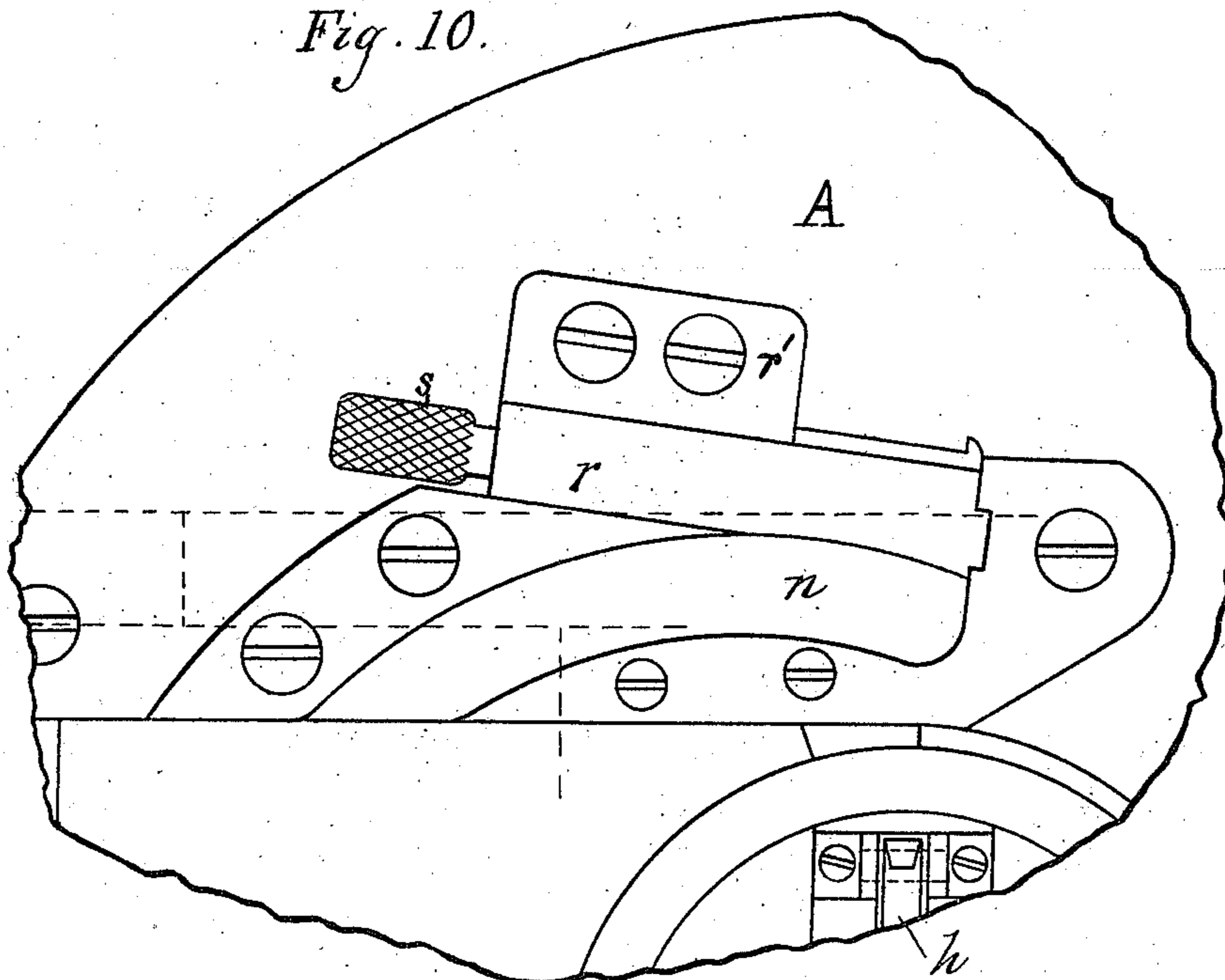


Fig. 10<sup>a</sup>.

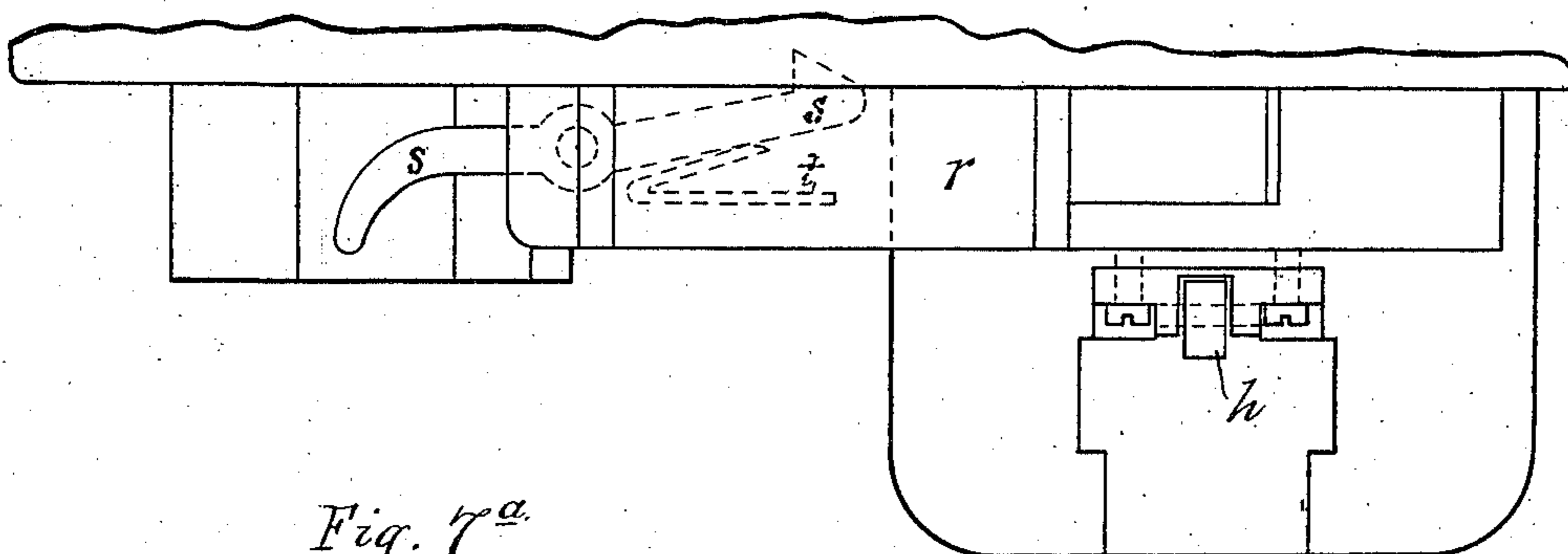


Fig. 7<sup>a</sup>.

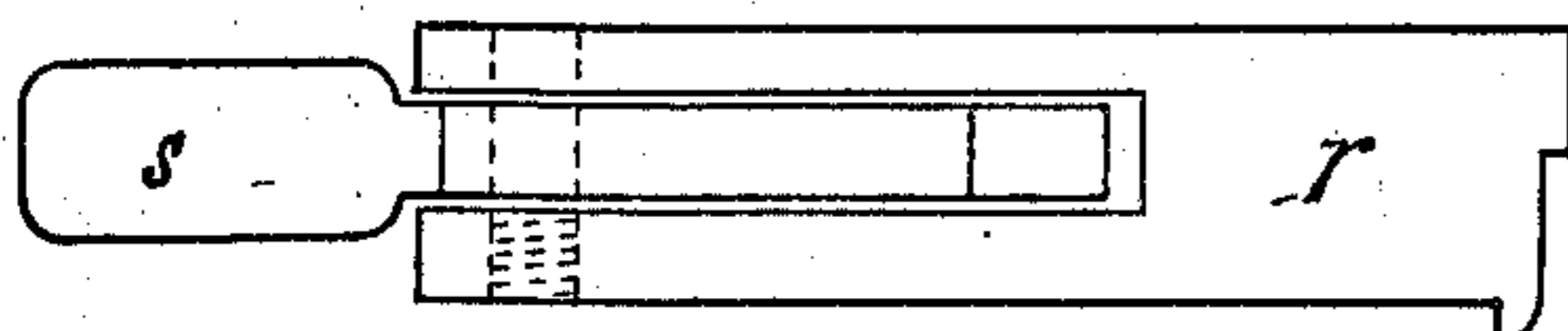


Fig. 7<sup>b</sup>.

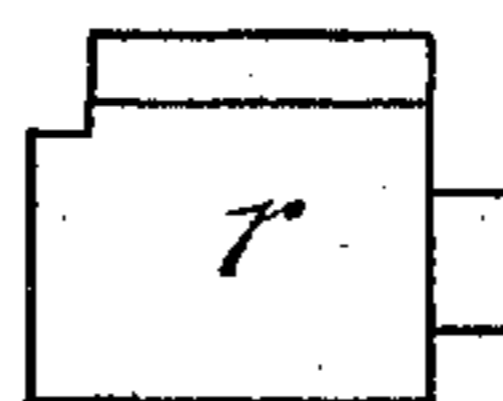
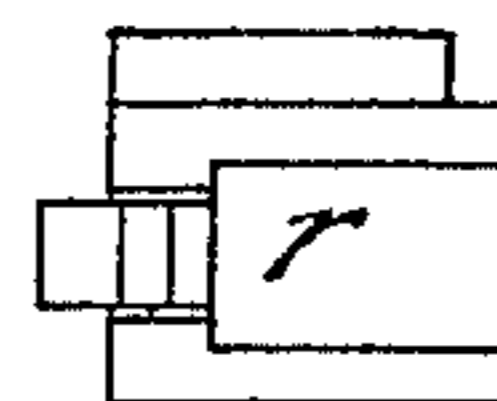


Fig. 7<sup>c</sup>.



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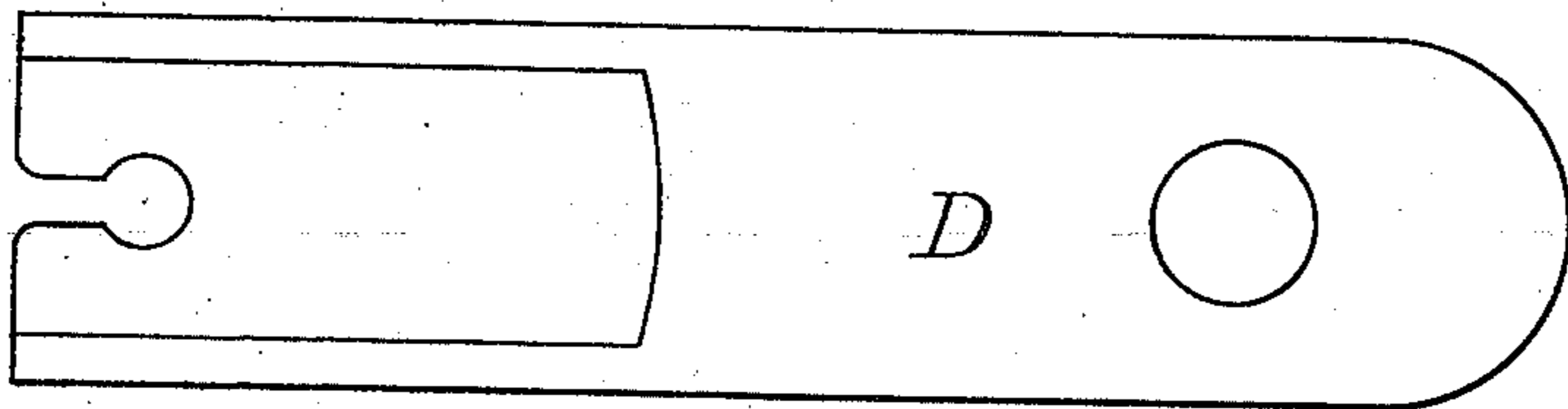
G. QUICK.

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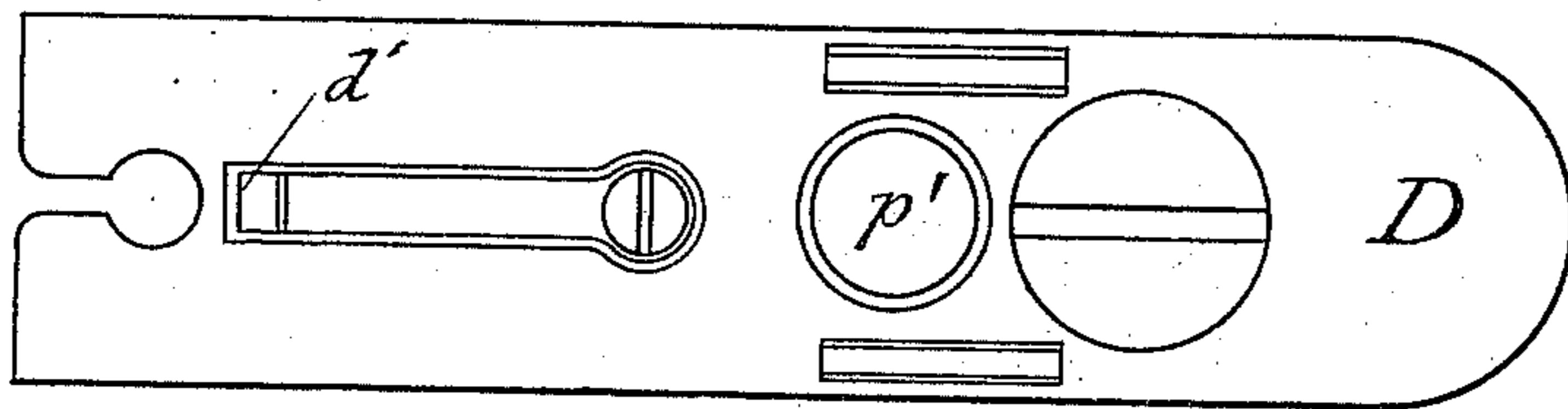
No. 324,272.

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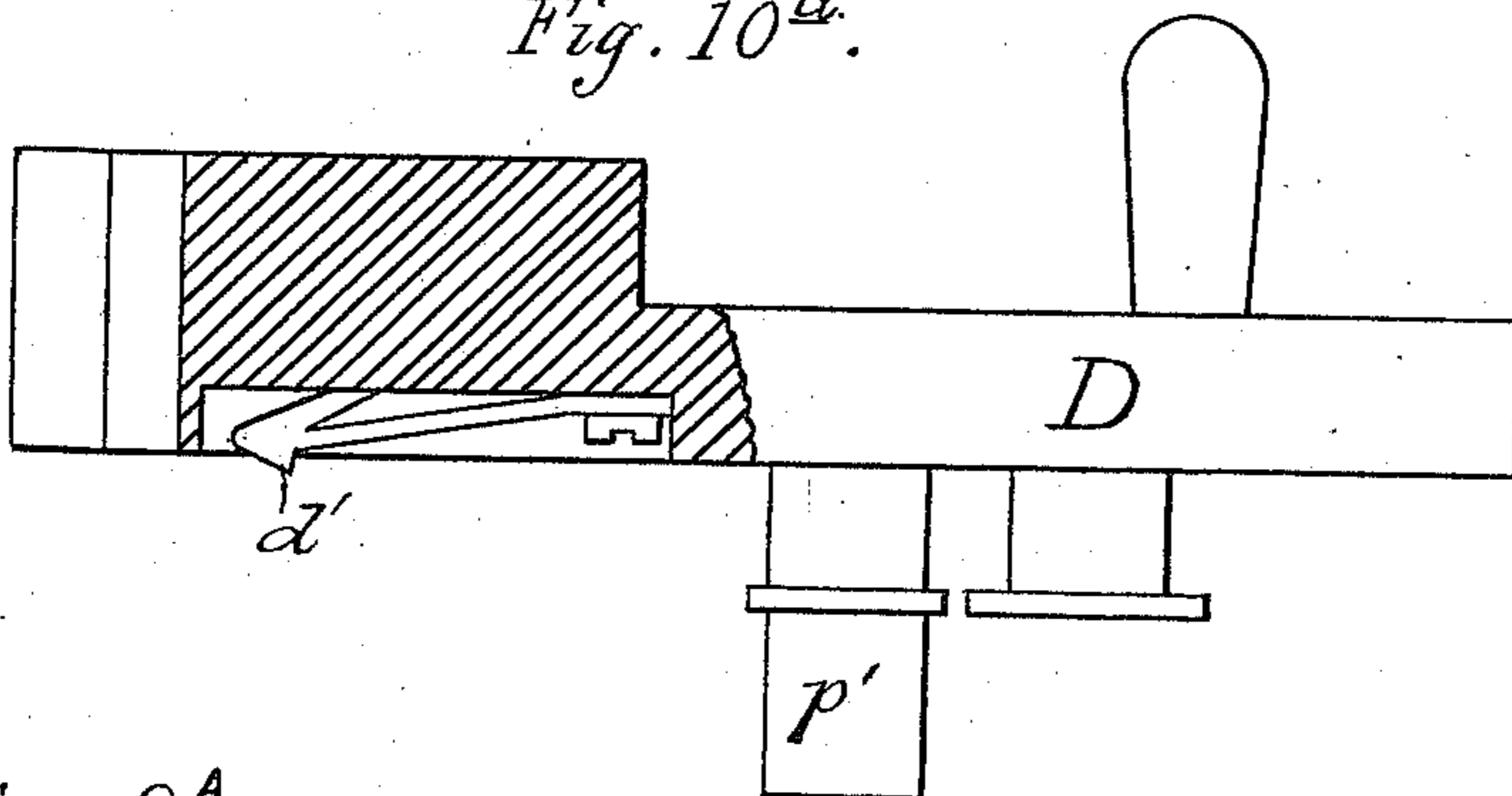
*Fig. 10<sup>b</sup>.*



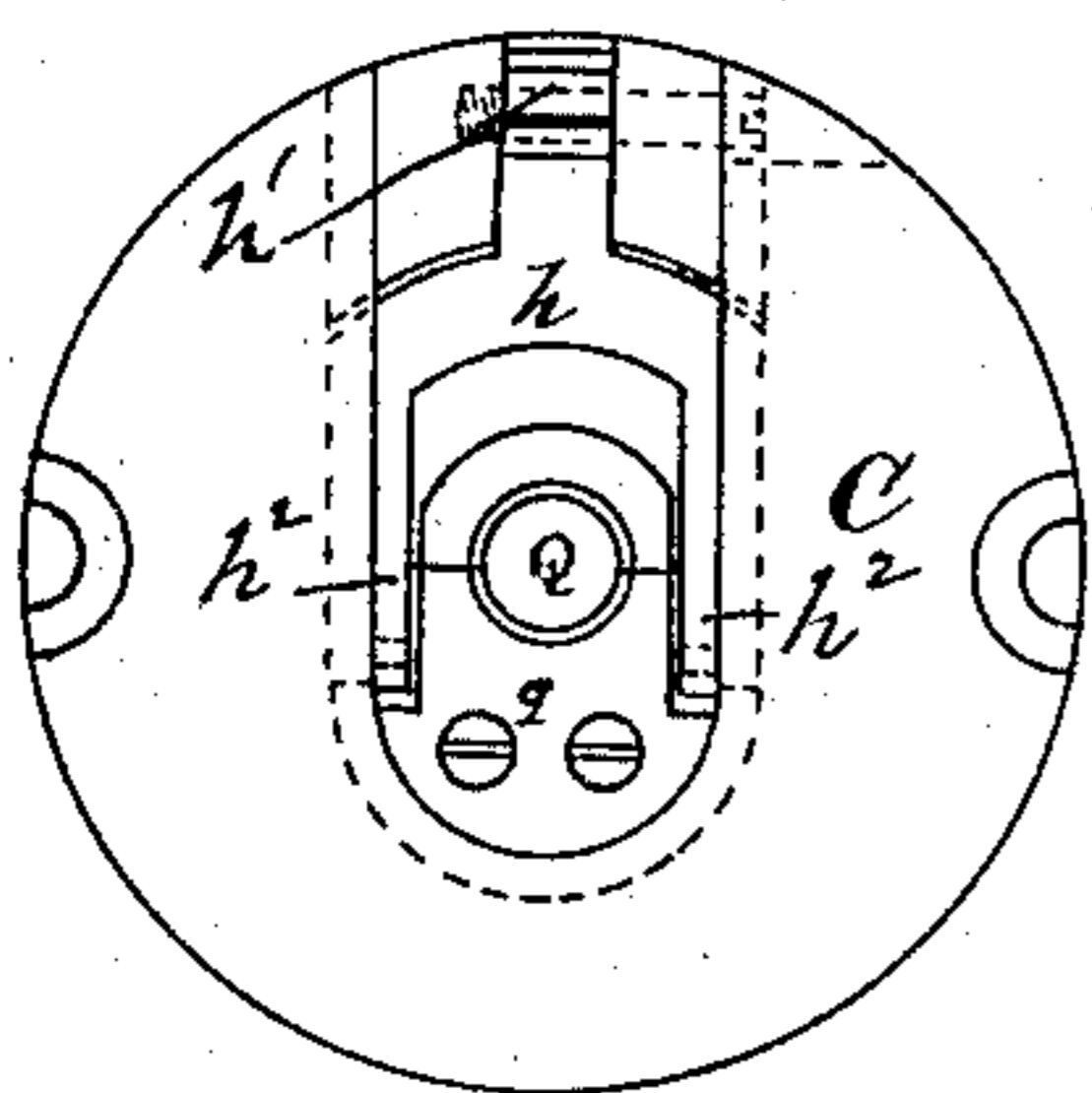
*Fig. 10<sup>c</sup>.*



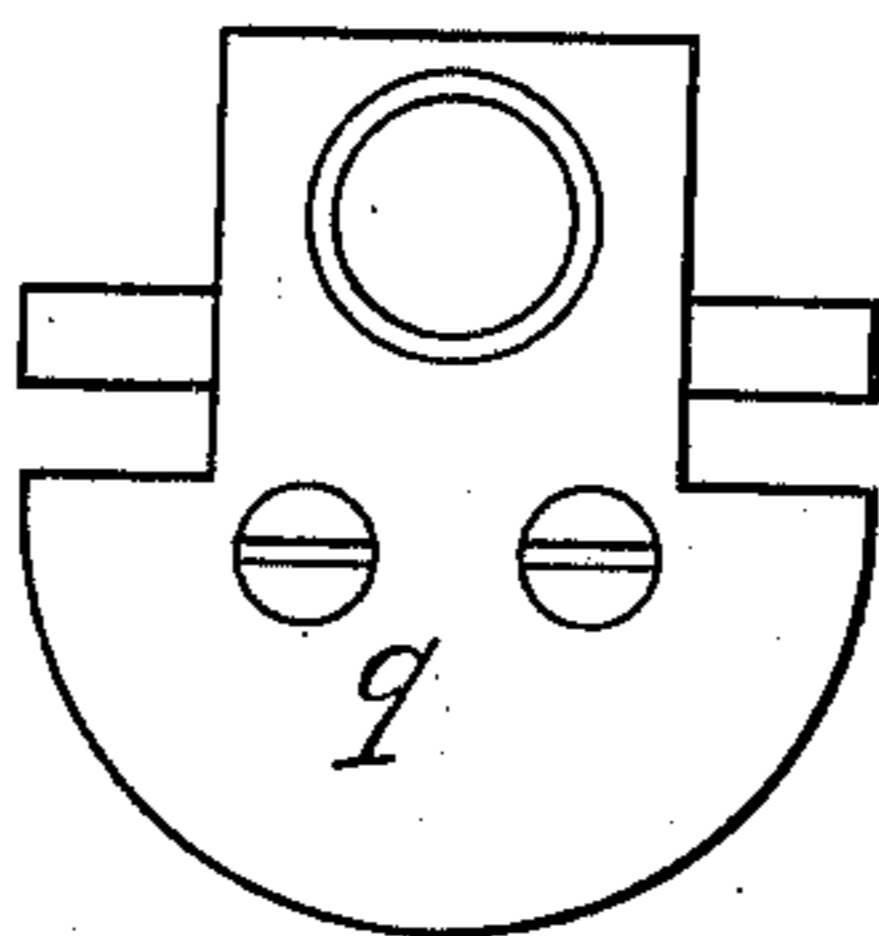
*Fig. 10<sup>d</sup>.*



*Fig. 8<sup>A</sup>.*



*Fig. 11<sup>d</sup>.*



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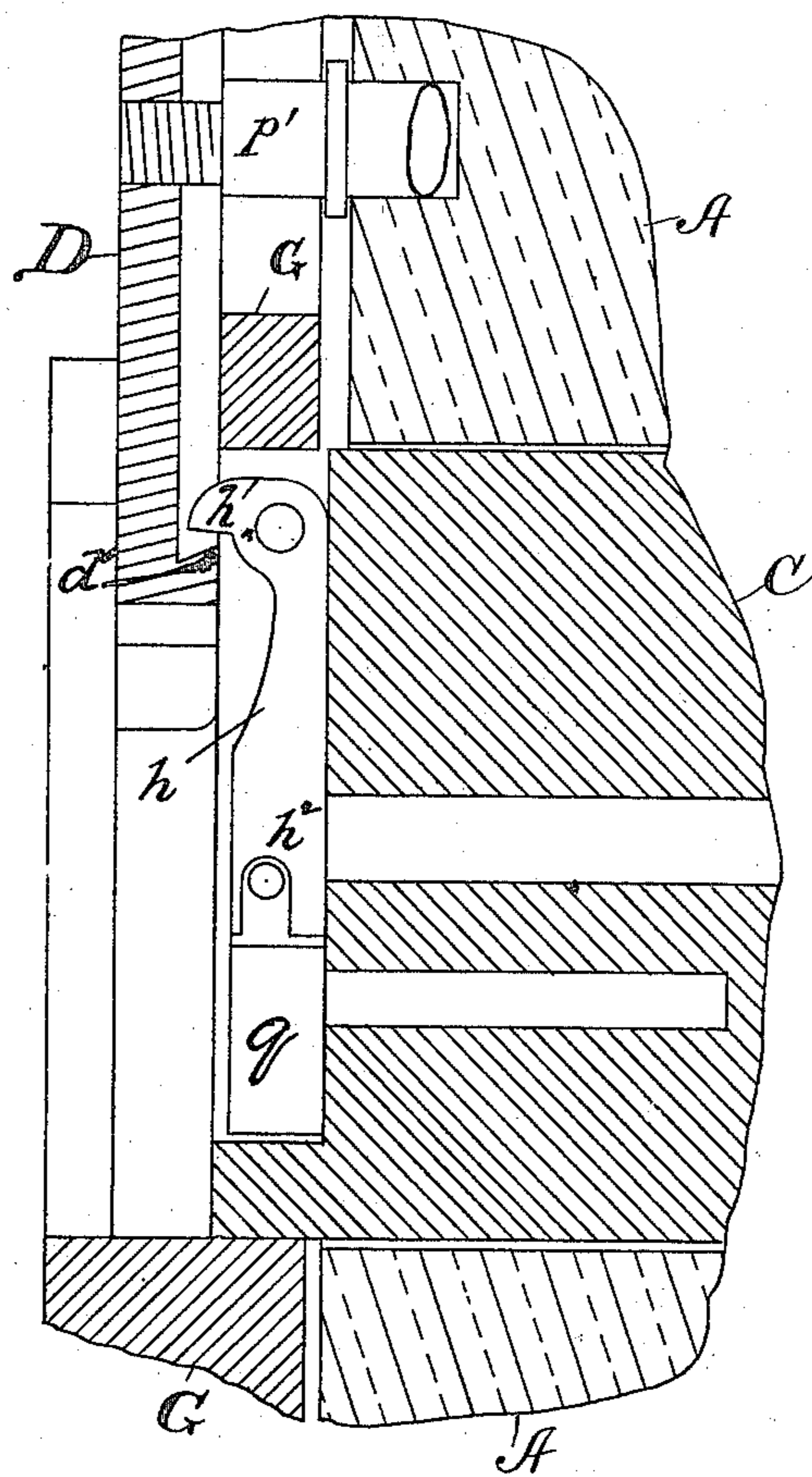
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Fig. 16.



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# UNITED STATES PATENT OFFICE.

GEORGE QUICK, OF CHIPPING-CAMPDEN, COUNTY OF GLOUCESTER,  
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## LOCK FOR BREECH-LOADING ORDNANCE.

SPECIFICATION forming part of Letters Patent No. 324,272, dated August 11, 1885.

Application filed June 11, 1884. (No model.) Patented in England January 10, 1884, No. 1,115; in Germany March 2, 1884, No. 30,502; in France April 23, 1884, No. 161,774; in Belgium May 21, 1884, No. 65,220, and in Italy June 30, 1884, XVIII, 16,939; XXXIII, 394.

*To all whom it may concern:*

Be it known that I, GEORGE QUICK, a subject of the Queen of Great Britain, residing at Chipping-Campden, in the county of Gloucester, England, have invented new and useful Improvements in Ordnance, of which the following is a specification.

My invention relates to improvements in the mechanism described in my former patent, "Breech-Loading Ordnance," No. 258,116, dated May 16, 1882.

The objects of these improvements are to obtain a greater amount of strength in the breech of the gun, greater facility for firing, better obturation, and to provide a simple arrangement for working the breech mechanism by fluid pressure, and an improved friction-primer for igniting the charges. A greater amount of strength in the breech of the gun is obtained, first, by forming the end of the sliding carriage, which acts as a guide for the insertion of the charge into the gun, of a reduced size, so that a smaller amount of the metal of the gun has to be cut away to form the receptacle of the said sliding carriage; secondly, by fitting the said sliding carriage with projecting lugs or keys on the upper and lower sides of its rear part fitting into corresponding recesses in the rear part of the carriage-way in the gun so as to tie these parts together, and thus help to resist any tendency there may be when the gun is fired to open the rear part of the said carriage-way.

I modify the construction of the sliding carriage by fitting it into the carriage-way with grooves in both the sliding carriage and the gun corresponding with each other, and fitting in the said grooves steel keys to help to resist the backward strain of the gas-pressure, by which means the perfect fitting of the surfaces of the said keys in the grooves is more easily effected than when the lands are formed out of the solid metal of the sliding carriage to fit the grooves in the gun.

The improvement in the firing apparatus has for its objects, first, the automatic closing of the vent by a sliding shutter securing the firing-primer in its place by the single movement of the breech-screw lever in closing

the chamber of the gun; secondly, the prevention of the firing of the charge until the breech-screw is completely screwed up; thirdly, the automatic opening of the vent and the extraction of the exploded primer by the single movement of the breech-screw lever when opening the powder-chamber for the gun to be loaded; fourthly, in case of misfire, to permit the firing-primer to be extracted from the vent without difficulty or necessity for opening the breech of the gun or moving the breech-screw lever. These objects are effected as follows:

The firing apparatus consists of a vent passing through the axis of the breech screw, with an enlarged chamber at the rear end of the vent adapted to receive a firing-primer in the ordinary manner, but the rear end of the breech-screw is prolonged a short distance beyond the breech-screw lever, and in this prolongation I form a slot or guide with grooves in which a vent-shutter is adapted to slide easily to and fro directly in rear of the enlarged chamber of the vent. The other end of the vent-shutter slides on the rear face of one end of the breech-screw lever, to which it is freely secured by one or more pins passing through an elongated slot in the said lever. One of these pins projects through the forward side of the lever and engages in a curved guide secured to the rear face of the breech of the gun, part of which guide is eccentric to the center of the said breech-screw, so that as the breech-screw is turned through one part of its travel the vent-shutter is caused to move to or from the center of the breech-screw; and thus to automatically cover or uncover the firing-primer in the vent. On the forward side of the sliding shutter is a projecting toe-piece or catch which operates on a primer-extractor, which extractor is hinged to the breech-screw directly over the chamber of the firing-primer, so that on the vent-shutter uncovering the vent the toe-piece actuates the extractor, which ejects the firing-primer. The vent-shutter may be adapted to use friction-primers, electric fuses, or percussion-primers, but in this application I restrict myself to the construction described for the friction-primers.

When friction primers are to be used, I form that end of the shutter which covers the primer with a narrow slot, so as to pass easily on each side of the friction-pin in the center of the primer. The end of the slot, which is directly in line with the friction-pin of the primer when the breech of the gun is perfectly closed, I enlarge somewhat, and on the friction-pin of the primer, close to the base of the said primer, I form a small collar of greater diameter than the said friction-pin, so that it cannot be drawn through the slot in the vent-shutter until the latter is completely home in its place, and the enlarged part of the slot is directly in line with the collar of the friction-pin, so that premature firing before the chamber of the gun is perfectly closed is rendered impossible.

The friction-primer consists of a short and strong cartridge-case, containing a friction-pin passing through an orifice in the base of the said case, the end of the said friction-pin inside the primer-case being enlarged, and the rear part or shoulder of the enlargement made conical and adapted to fit into and close a corresponding recess formed in the base of the said primer-case when the friction-pin is drawn back. The surface of the enlarged part of the friction-pin is roughened, and is surrounded by ordinary detonating material in the usual manner, to fire the charge of meal powder in the body of the primer-case. The friction-pin is held in its proper position by a small pin or rivet passing through the side of the base of the primer, and engaging in a small recess formed in the side of the friction-pin. On the friction-pin being drawn back to fire the primer the rivet is sheared off, the conical part of the friction-pin closes the orifice in the base of the primer-case gas-tight, the pressure of the powder-gas on the end of the friction-pin also assisting to force the pin into its seating on the firing taking place. On the friction-pin, and close to the base of the said primer, I form a small collar of greater diameter than the said pin, so that it cannot be drawn through the vent-shutter until the said vent shutter is completely home, and the enlarged part of the slot in the vent-shutter is directly in line with the collar on the pin, and as the said enlarged part of the slot in the shutter can be in line with the collar only when the breech of the gun is perfectly closed, premature firing of the charge is prevented. At the extreme rear end of the friction-pin an eye is formed to receive the hook of the firing-lanyard. This friction-primer may be employed for firing other descriptions of guns as well as those described in my patent.

To permit the firing-primer to be extracted from the vent in case of misfire, I form one part of the upper side of the curved guide which directs the vent-shutter movable, but held in position by a guide-plate and spring-catch.

When it is desired to extract the primer, the spring-catch of the movable part is pressed

down, and the movable piece drawn back by one hand of the operator. The vent-shutter is then drawn back sharply by the other hand, by which the firing-primer is uncovered and then extracted from the vent without the necessity for the breech-screw being moved. A fresh primer can be then inserted, the vent-shutter closed, and the sliding piece of the guide returned into its place and secured to the gun by the spring-catch.

The improvement in the obturator consists in fitting a cylindrical metal ring into a recess in the rear of the powder-chamber, the interior diameter of the ring being less than the diameter of the powder-chamber, but sufficiently large for the projectile and cartridge to be passed through it easily. The rear end of the exterior of the ring is of greater diameter than the forward end, the two exterior diameters being connected by a conical or conoidal surface. The recess which receives the ring has a corresponding conical or conoidal surface, against which the ring is forced up by the breech screw. The cylindrical part of the recess has one or more grooves cut in its surface, so as to reduce the bearing-surface of the metal of the gun on the ring. As the surface of the forward or muzzle end of the ring is freely exposed to the pressure of the gas, while the rear end is not so exposed, the tendency of the gas-pressure will be to force the ring back upon the breech-screw. The face of the breech-screw may have a flat surface to bear against a corresponding flat surface on the rear of the gas-ring; but I prefer to secure to the face of the breech a plate of metal, preferably of tempered steel, presenting a concentric corrugated surface to the powder-charge, and having a conically-shaped periphery fitting into a conical seating formed in the rear end of the gas-ring. On the charge being fired, the gas-pressure slightly flattens the corrugated plate, by which the periphery of the plate is expanded tightly into the conical seating in the gas-ring, the gas-ring being at the same time pressed backward into the corrugated plate, and also expanded tightly into its seating in the gun by the said gas-pressure.

The breech mechanism hereinbefore described, with vent-shutter complete, may be actuated in large guns by a pinion gearing into a wheel fixed on the breech-screw, as described in Patent No. 258,116, dated May 16, 1882; but to use fluid-pressure with this mechanism I employ only one cylinder, and a piston connected with a rack-gearing, with a wheel fixed on the breech-screw, and on the said breech-screw I affix also a lever having an arm which carries the vent shutter and the pin by which the sliding carriage is moved. By these means the breech-screw, the vent-shutter, the extractor, and the sliding carriage are actuated by one movement of the lever of the cock or valve which admits the fluid-pressure to the cylinder.

In the drawings, Figure 1 is an elevation of the rear end of the breech of the gun

closed, as when ready for firing. Fig. 2 is the same, but with the breech opened ready for the gun to be loaded. Fig. 3 is an elevation of the right-hand side of the breech of the gun, and Fig. 4 is an elevation of the left-hand side of the same. Fig. 5 is a vertical longitudinal section of the breech closed as when ready for firing. Fig. 6 is a vertical transverse section at Y Z of Fig. 5. Fig. 7 is a section of the sliding piece *r*, showing the construction on a larger scale. Fig. 7<sup>a</sup>, 7<sup>b</sup>, and 7<sup>c</sup> are respectively an under side view and the end views, on an enlarged scale, of the sliding piece *r* and catch *s*, Fig. 7<sup>b</sup> being an end view of the right side of the gun, and Fig. 7<sup>c</sup> an end view at its left side. *s* designates the catch to lock the piece to the gun, and *e* the spring for actuating the catch. Fig. 8 is an elevation on an enlarged scale of the rear end of the breech-screw, the sliding shutter being removed showing the arrangement of the extractor *h*. Fig. 8<sup>a</sup> is a slight modification of Fig. 8. Figs. 9, 9<sup>a</sup>, and 9<sup>b</sup> are respectively an elevation, section and end views showing the arrangement of the friction-primer. Figs. 10 and 10<sup>a</sup> are enlarged views of parts of Figs. 1 and 2 and adjacent parts, and showing the guard, catch-slide, guide, and extractor-lever. Figs. 10<sup>b</sup>, 10<sup>c</sup>, and 10<sup>d</sup> are respectively rear face, front face, and partial sectional views, enlarged, of the sliding vent-shutter D. Figs. 11, 12, and 13 are details of the extractor-gear, as shown applied in Fig. 8<sup>a</sup>. Fig. 11<sup>a</sup> shows a desirable form of extractor for a friction-primer. Fig. 14 is a vertical longitudinal section showing the arrangement of the obturator. Fig. 15 shows an elevation of the breech of a gun fitted with gear-operating mechanism. Fig. 16 is an enlarged section of part of the breech of the gun showing the connection of the vent-shutter with the extractor.

In Figs. 1 to 6, inclusive, the firing apparatus shown is that adapted to use friction or electric primers. In these figures A is the body of the gun. B is the sliding carriage. C is the breech-screw. D is the vent-shutter. E E' is the loading-tray, forming part of the sliding carriage. There are two studs or stops on the loading-tray to limit the travel of the sliding carriage and loading-tray, as may be required. When both stops remain in their place, the position of the loading-tray, when the breech is open, is as shown in Fig. 2, but when the left-hand stop is removed the breech-screw is permitted to go farther to the left, and the part E' of the loading-tray is brought in line with the powder-chamber, the face of breech-screw being forced over to the left of the gun, so that the obturator is freely exposed. F and F' are the tie-pieces or keys for preventing the rear part of the carriage-way from opening when the gun is fired. G is the lever for actuating the breech-screw and mechanism. *m* is the guide for the pin *p* in the end of the lever. *g* is a bolt screwed into the breech-screw through which the axial vent is

formed. *n* is the curved eccentric-guide for the pin *p* (see Fig. 5) for actuating the vent-shutter D, and *r* is the movable part of the guide for permitting the opening of the vent by hand. *r'* is a guard screwed to the gun immediately above the movable part or slide *r*, to keep the same in position. The vent-shutter D is provided with a toe-piece, as in Figs. 5 and 16, or with a spring-catch, *d'*, as in Figs. 10<sup>c</sup> and 10<sup>d</sup>, which operates the short arm *h'* of the extractor-lever *h*. The extractor *g* is pivoted upon the lower and longer arm, *h''*, of the extractor-lever. When the short arm of the lever is operated by the toe-piece or catch, the long arm will recede from the gun, carrying the extractor with it, as also the firing-primer.

J is a spring-catch to lock the lever G to the gun, but this spring-catch is not claimed as of my invention.

In Figs. 7 to 9<sup>b</sup>, inclusive, P is the metal case. Q is the friction-pin. *t* is the safety-collar on the friction-pin, and *v* is a small stud or rivet which holds the friction-pin in its place, but which is sheared off on the firing-lanyard being pulled.

The mechanism shown in Figs. 8, 11, 12, 13 is applicable to friction-primer breech mechanism.

A in Fig. 14 is the metal of the gun. B is a part of the sliding carriage. C is a part of the breech-screw. *g* is the vent-bolt which secures the concentric corrugated valve-face Z to the breech-screw, and Y is the obturating ring fitting into a recess in the rear of the powder-chamber.

Referring to Fig. 1, it may be here remarked that other forms of breech mechanism may be used instead the crank G—as, for instance, intermeshing gears or rack and gear.

In Fig. 15 is shown an elevation of the breech of a gun fitted with a pinion which is carried by a bracket secured to the sliding carriage, and which gears into a wheel fixed on the breech-screw. It is applicable to those large guns in which a certain multiplication of power is required to work the breech mechanism. In this figure, A is the gun; B, the sliding carriage; C, the breech-screw. G is the arm or lever. T is the wheel secured to the breech-screw. *g'* is the pinion with crank-lever for actuating the whole mechanism.

Having thus fully described the nature of my said invention, I wish it to be distinctly understood that I do not confine myself strictly to all the details herein described, as such may be varied somewhat without departure from the principles of the said invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with a gun having a horizontal slideway extending transversely to the bore about one caliber from the extreme rear end of the breech of the gun, the said slideway being of reduced size at one side of the gun and provided upon its upper and lower sides with grooves, of a sliding carriage hav-

- ing one end of a reduced size to fit into the said slideway, into which grooves keys are fitted, the said carriage having a loading-tray at its reduced end, and a breech-screw fitting into said carriage, the said breech-screw gearing also in its rear part into the metal of the gun in the rear of the slideway, the said breech-screw being adapted to close the powder-chamber, all substantially as set forth.
- 10 2. The combination, with a gun having a breech-screw and having a primer-chamber or vent in said breech-screw, of a sliding shutter working in grooves in said breech-screw and upon the breech-screw lever, the said shutter
- 15 having a pin passing and projecting through a slot in said lever, which pin gears into an eccentric slot or guide on the gun, which, as the lever is moved, causes the said shutter to advance over and cover the said primer-chamber or vent as the breech of the gun is closed,
- 20 and to recede from and uncover the primer-chamber as the breech is opened, the said shutter having an orifice therein, through which the firing-pin of a friction-primer may
- 25 pass, substantially as described.
3. The combination, with a gun having a breech-screw with a primer-chamber therein, a sliding shutter for said primer-chamber, and an eccentric guide for such shutter, of a lever
- 30 with a long and a short arm at right angles to each other, the lever being over the primer-chamber or vent, the long arm of which lever forms part of the primer-chamber, and by the

movement of which the primer is extracted when the short arm of the lever is acted on by a catch in the said shutter, substantially as described.

4. The combination, with the vent-shutter, of the eccentric guide for actuating the pin on such shutter, of a slide forming a portion of the said guide and having a spring-catch, a guard screwed to the gun immediately above the slide, said catch and guard serving to hold the said slide in position, but permitting the said slide to be moved so as to open the guide to allow the vent-shutter to be drawn back by hand and uncover the vent and extract the primer in case of misfire, substantially as described.

5. The combination, with a metal gas-ring fitting in the rear end of the powder-chamber and adapted to be forced backward by the pressure of the gas and having a conically-shaped seating at its rear end, of a breech-screw having a corrugated metal face and having a corresponding conically-shaped periphery to fit into said seating in the metal gas-ring, substantially as described.

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