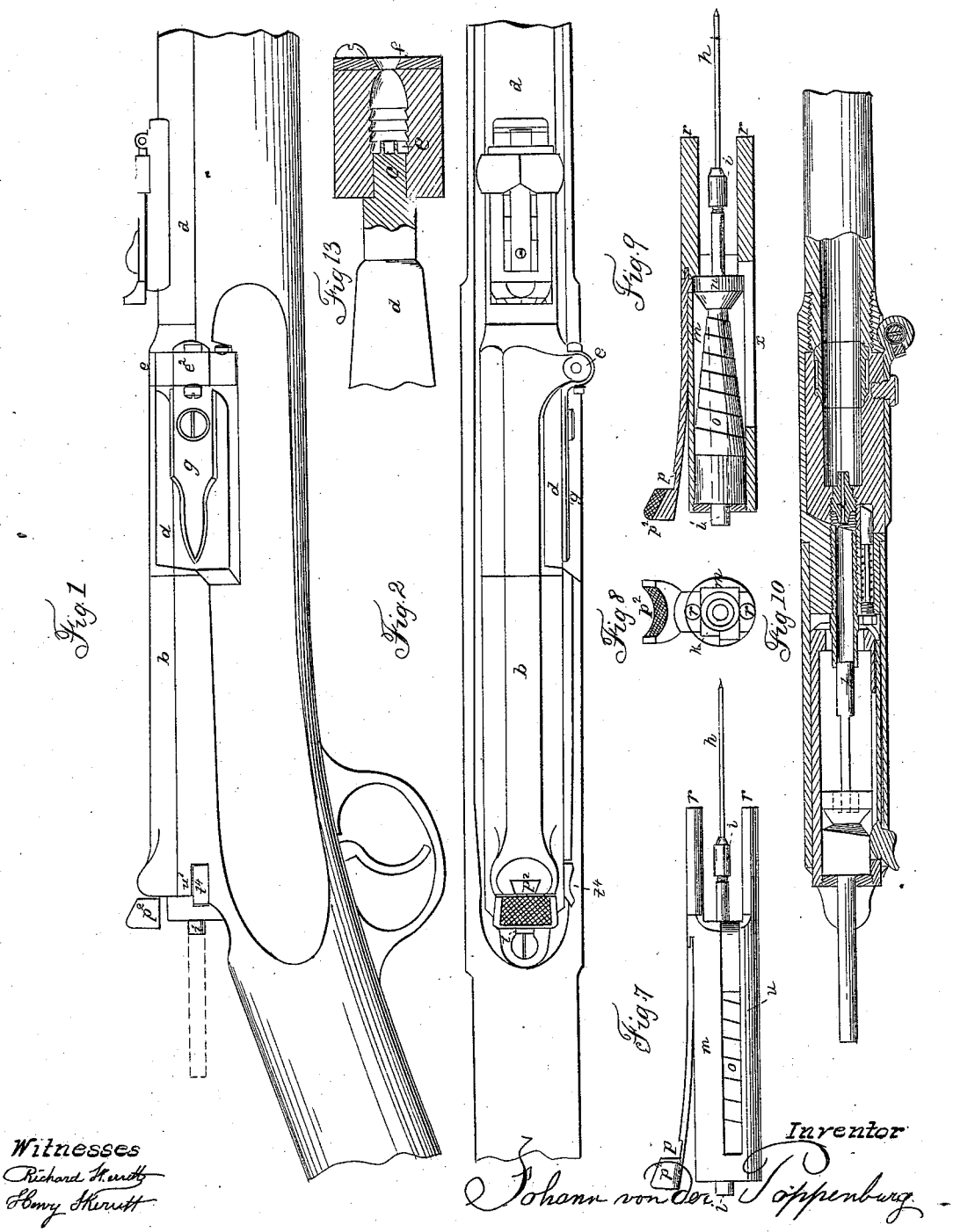
2 Sheets—Sheet 1.

J. VON DER POPPENBURG.

Breech-Loading Fire-Arm.

No. 50,670. Patented Oct. 24, 1865.



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2 Sheets—Sheet 2.

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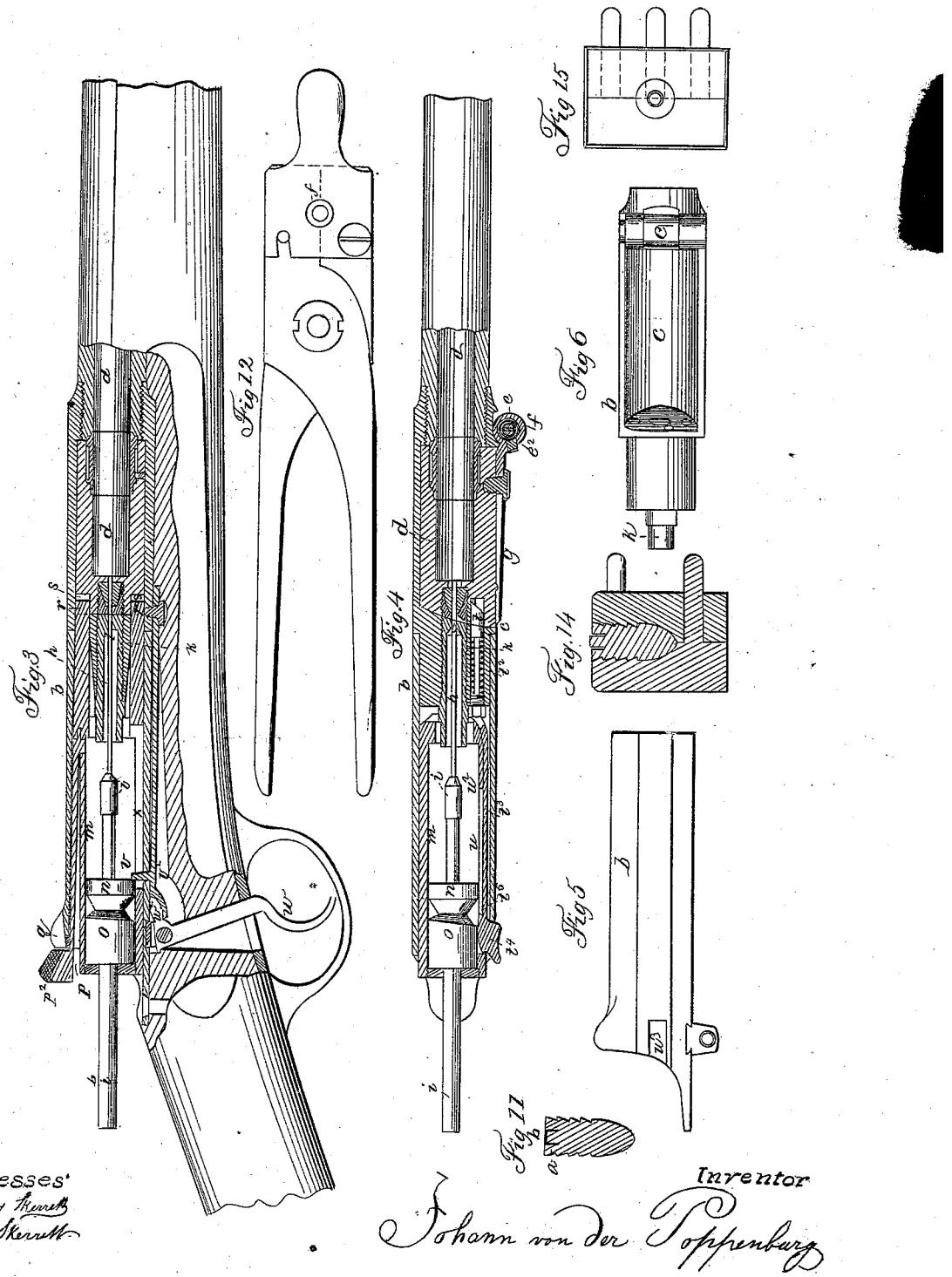

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UNITED STATES PATENT OFFICE.

JOHANN VON DER POPPENBURG, OF BIRMINGHAM, COUNTY OF WARWICK, ENGLAND.

IMPROVEMENT IN BREECH-LOADING FIRE-ARMS.

Specification forming part of Letters Patent No. **50,670**, dated October 24, 1865.

To all whom it may concern:

Be it known that I, JOHANN VON DER POPPENBURG, of Birmingham, in the county of Warwick, England, engineer, a subject of the King of Prussia, have invented or discovered new and useful Improvements in Central-Fire Breech-Loading Fire-Arms; and I, the said JOHANN VON DER POPPENBURG, do hereby declare the nature of the said invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement thereof—that is to say:

My invention consists of the following improvements in central-fire breech-loading fire-arms: I elongate the barrel at its rear or breech end, and in the said elongated part I make an opening, to which I hinge a charge-chamber. The said charge-chamber is hinged to the side of the barrel and opens by moving in a horizontal plane. In opening for the reception of the charge the free end of the said charge-chamber is thrown toward the muzzle of the gun, the open end of the charge-chamber being turned toward the breech end of the gun. After the introduction of the charge the chamber is turned upon its hinge and introduced into the opening in the barrel. The discharge of the gun is effected by a central striker, which strikes either upon a percussion-cap put on a nipple fixed in the back of the charge-chamber or the said striker forces a needle through a small hole in the back of the charge-chamber and discharges the cartridge. The said striker is constructed and worked in the following manner: A tubular slide working in the prolongation of the barrel and moving in the direction of the axis of the barrel carries in its axis the cylindrical rod described, which has on its inner end the needle already referred to. When a percussion-cap is employed a hammer-head is fixed in place of the said needle. The said rod and tubular slide are connected by a spiral spring surrounding the rod, which spring tends to press the rod within the slide. After discharge the rod and slide are drawn back together, and the trigger engages with the said rod and fixes it in its withdrawn position. By pressing forward the slide the spring is compressed, and the charge-chamber is at the same time bolted down. The slide is fixed in position by a snap-fastening. On pressing the trigger the central rod is disengaged and is urged forward by the compressed spring, so as to cause it to strike the cartridge and discharge the gun. The charge-chamber springs open on the withdrawal of the slide and is fixed down, before the bolting described takes place, by a sprin bolt fastening. The charge-chamber is capable of turning into a position at right angles to its normal position, so that when opened its mouth may be brought uppermost, and it may be charged with a bullet and loose powder, similar to a muzzle-loading gun.

Having explained the nature of my invention, I will proceed to describe, with reference to the accompanying drawings, the manner in which the same is to be performed.

Figure 1 represents, in side elevation, and Fig. 2, in plan, a portion of a central-fire breech-loading gun constructed according to my invention, the parts of the gun being in the positions which they respectively assume after the gun has been discharged. Fig. 3 is a longitudinal vertical section, and Fig. 4 a horizontal section, of the same, the parts being in the positions which they respectively assume when the gun is ready to be discharged. Figs. 5, 6, 7, 8, and 9 represent portions of the same, as hereinafter explained.

The same letters indicate the same parts in Figs. 1, 2, 3, 4, 5, 6, 7, 8, and 9.

a is the barrel of the gun, elongated at its rear or breech end. The elongated part is marked *b*. In the said part *b* an opening at *c* is made, to which a charge-chamber, *d*, is hinged. The said chamber is hinged at *e* to the side of the barrel *a*, and opens by moving in a horizontal plane. In opening the charge-chamber *d* for the introduction of the cartridge, the free end of the chamber is thrown toward the muzzle end of the gun, the open end being turned toward the breech end of the gun. The throwing back of the charge-chamber is effected by a coiled flat spring, *f*, situated around the axis of the joint *e*, one end of the spring being fixed to the axis of the joint and the other end to the movable knuckle e^2, connected by the arm *g* to the charge-chamber *d*. When the charge-chamber is turned into the opening *c* in the prolonged part *b* of the barrel the spring *f* is tightened or compressed upon the axis of the

hinge *e*. On releasing the charge-chamber the tension of the spring opens the said chamber and throws it upon the outside of the barrel. The prolonged part *b* of the barrel is made in two parts. (Represented separately in Figs. 5 and 6.) In Fig. 6 the charge-chamber is represented removed.

The gun is discharged by means of a needle, *h*, fixed to a central rod or striker, *i*. The said needle passes through a tube, *k*, in the prolonged end of the barrel, and also through a hole in the tube *l*, fixed in the back of the charge-chamber *d*. The said rod or striker *i* is constructed and worked in the following manner:

m is a tubular slide working in the prolonged end *b* of the barrel, the said tubular slide carrying the discharging mechanism of the gun, as well as that by which the charge-chamber *d* is fastened down. This tubular slide and parts carried by it is shown separately in side elevation in Fig. 7, end elevation in Fig. 8, and longitudinal section in Fig. 9. In the axis of the tubular slide *m* is the rod or striker *i*, having at its front the needle *h*, and at about its middle the short cylinder or block *n*, working freely in the interior of the said slide and guiding the rod *i*. The said rod *i* is further guided by its outer end working in a hole in the closed outer end of the slide *m*. (See Figs. 3 and 4.) The rod *i* and tubular slide *m* are connected together by a flat coiled spring, *o*, one end of which spring is fixed to the top of the slide *m* and the other end to the short cylinder *n*. By means of the said spring *o* the rod *i* and needle *h* are urged forward to discharge the gun. The tubular slide *m* is fixed in the prolonged part *b* of the barrel by a spring-fastening at *p*, the spring of the said fastening being fixed to the top of the said slide, the said spring-fastening engaging with a shoulder at *q* on the cylindrical surface of the said prolonged part. By depressing the thumb-plate p^2 the spring-fastening *p* is liberated from the shoulder *q*, and the said slide can be drawn back by means of the said thumb-plate nearly out of the prolonged end *b* of the barrel. The charge-chamber *d* is fixed in its place during discharge by means of two rods or bolts, *r r*, on the front end of the slide, being made, when the slide is pushed home, to enter holes or recesses *s s* in the front end of the said chamber, and securely hold it down. A snap-bolt, *t*, also assists in holding down the charge-chamber, the said snap-bolt being pressed outward by the coiled spring t^2. The snap-bolt *t* is connected to a flat spring, t^3, having a head or thumb-plate, t^4, at its end. This head or thumb-plate t^4 works in a slot, *u*, in the tubular slide *m*, and also in a slot, w^3, in the end of the prolonged part *d* of the barrel. (See Figs. 1 and 5.) The rod *i*, carrying the needle *h*, is fixed in position for firing by means of a tooth, *v*, carried by a spring, v^2, the said tooth being liberated by means of the trigger *w* of the gun, the short arm w^2 of which is made to act upon the free end of the spring v^2. The said tooth *v* works in a slot, *x*, in the tubular slide *m*, and passes through an opening in the bottom of the prolonged part *b*.

The action of the parts is as follows: When the gun has been discharged the needle *h*, rod *i*, and spring *o* are in the positions represented in Figs. 7 and 9—that is, the needle *h* is situated in the charge-chamber *d*, and the short cylinder *n* is held by the expanded spring *o* against the front end of the tubular slide *m*. In order to reload the gun the thumb-plate p^2 is depressed, so as to liberate its spring-fastening *p* from the prolonged part *b*. By drawing back the slide *m* the needle *h* is withdrawn from the axis of the charge-chamber, and the pins or bolts *r r* at the end of the slide are also withdrawn from the charge-chamber. The same motion also withdraws the snap-bolt *t*, the withdrawal of the said snap-bolt being effected by the end u^2 of the slot *u* in the slide coming against the shoulder t^5 of the head t^4 of the spring t^3, and giving a sliding motion to the said bolt by making the head t^4 advance in its slot w^3 in the prolonged part *b* of the barrel. On the withdrawal of the snap-bolt *t* the charge-chamber *d* is thrown back by the action of the spring *f* ready to receive a fresh cartridge. When the pressure is removed from the slide *m* the snap-bolt *t* is pressed outward by its spring t^2 a short distance only—that is, to a distance much less than that represented—into the opening *c*, in which the charge-chamber shuts down. During the withdrawal of the slide *m* the short cylinder *n* acts upon the tooth *v* of the spring v^2 and depresses it until the slide has been drawn back to the full extent, when the said tooth is raised by its spring, and engaging behind the short cylinder fixes it, and thus holds the needle *h* in its withdrawn position, as illustrated in Figs. 3 and 4. The cartridge having been introduced into the charge-chamber *d* the said chamber is shut down into the barrel and fastened by the snap-bolt *t*, the beveled face of the said charge-chamber pressing back the beveled end of the snap-bolt, to enable it to enter the barrel. By now pressing forward the tubular slide *m*, by the thumb-plate p^2, into the position represented in Figs. 3 and 4, the pins or bolts *r r* and the snap-bolt *t* are made to enter their respective recesses in the end of the charge-chamber *d* and hold it securely for firing. This motion of the tubular slide *m* also compresses the spring *o* between its top and the short cylinder *n*. When the tubular slide has been pushed home it is fixed by the spring-fastening *p*, as before explained. The last-described motion of the slide *m* does not affect the rod *i* and needle *h*, the said parts being fixed, by the engagement of the tooth *v*, behind the short cylinder *n*. The parts of the gun now have the positions represented in Figs. 3 and 4, and the gun is ready for discharge. On pulling the trigger *w* its short arm w^2 depresses the spring v^2 and liberates the tooth *v* from the short cylinder *n*. The central rod, *i*, is now urged forward by the compressed spring *o*, causing the needle *h* to pass through the

tubes *k* and *l* into the cartridge in the breech-chamber *d* and discharge the gun. When it is required to wholly remove the tubular slide *m* and parts connected with it from the prolonged end of the barrel the said slide is withdrawn to its full extent, the only obstacles to its being wholly withdrawn being the part w^2 of the slide engaging with the shoulder t^5 of the head t^4 and the tooth *v*. By pressing upon the trigger *w*, so as to withdraw the tooth *v* from the slot in the slide, and at the same time pressing the head t^4 outward from the slide, the said slide can be wholly withdrawn from of the barrel.

When the gun is to be discharged by a percussion-cap I screw into the back of the charge-chamber a nipple and remove the needle and use in place thereof a hammer-head. This arrangement of my invention is represented in longitudinal section in Fig. 10 of the drawings. The hammer-head, by which the percusssion-cap is discharged, is marked 1, and the nipple at the back of the charge-chamber, for receiving the percussion-cap, is marked 2. In other respects the construction and action of the parts of the gun represented in Fig. 10 are precisely the same as those hereinbefore described and represented in the needle-gun, Figs. 1, 2, 3, 4, 5, 6, 7, 8, and 9.

Fig. 11 represents a projectile especially adapted to my fire-arm. In the base of the projectile I make an annular depression, *a*, of a size proper to receive an ordinary percussion-cap. The part within the depression somewhat resembles a nipple. Upon the said nipple-piece I place a percussion-cap, *b*, the said nipple-piece occupying the inside of the percussion-cap. By means of a hammer or mallet, or by pressure, I force the percussion-cap upon the central piece until the closed end of the cap is flush with the base of the projectile. The projectile, Fig. 11, is made into a cartridge in the ordinary way, the pin or needle of the gun passing through the powder to strike upon and discharge the percussion-cap.

In making blank cartridges and cartridges for sporting and other purposes the tubular cup of papier-meché or other hard non-metallic substance has an annular depression in its base to receive the percussion-cap, similar to that represented in the projectile, Fig. 11 In casting the projectile I use molds of the construction represented in plan and section in Figs. 12 and 13. The said molds are of the ordinary construction, excepting that the bottom is closed by a plug, *c*, held by a handle, *d*. The top of the plug *c* has a projecting hollow piece, *e*, of the size of the annular depression to be made in the projectile. When the fused lead or other soft metal or alloy is poured through the gate *f* into the molds, the said lead fills up the molds, excepting that part occupied by the hollow piece *e*, the said piece forming the annular depression in the finished projectile. In fixing the percussion-cap upon the center nipple-piece of the projectile by pressure or percussion, I support the projectile in a holder made in halves of the kind represented in Figs. 14 and 15.

Having now described the nature of my invention and the manner in which the same is to be performed, I wish it to be understood that I do not limit myself to the precise details herein described and illustrated in the accompanying drawings, as the same may be varied without departing from the nature of my invention; but

I claim as my invention—

1. The construction of the spring-hinge of the movable charge-chamber hereinbefore described and illustrated in the accompanying drawings.

2. The arrangement and combination of the parts described and represented for bolting down the charge-chamber during the discharge of the gun.

3. The construction of the snap-bolt described and represented for holding the charge-chamber in its place when shut down, as well as for assisting in bolting down, the charge-chamber for discharge; also the arrangement of parts for working the said snap-bolt.

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