

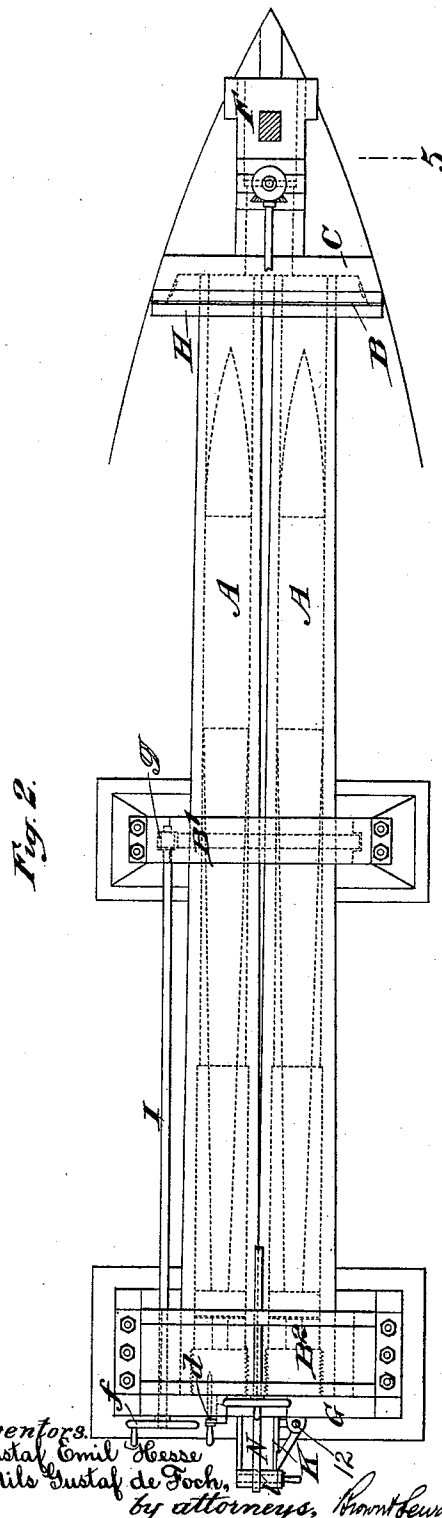
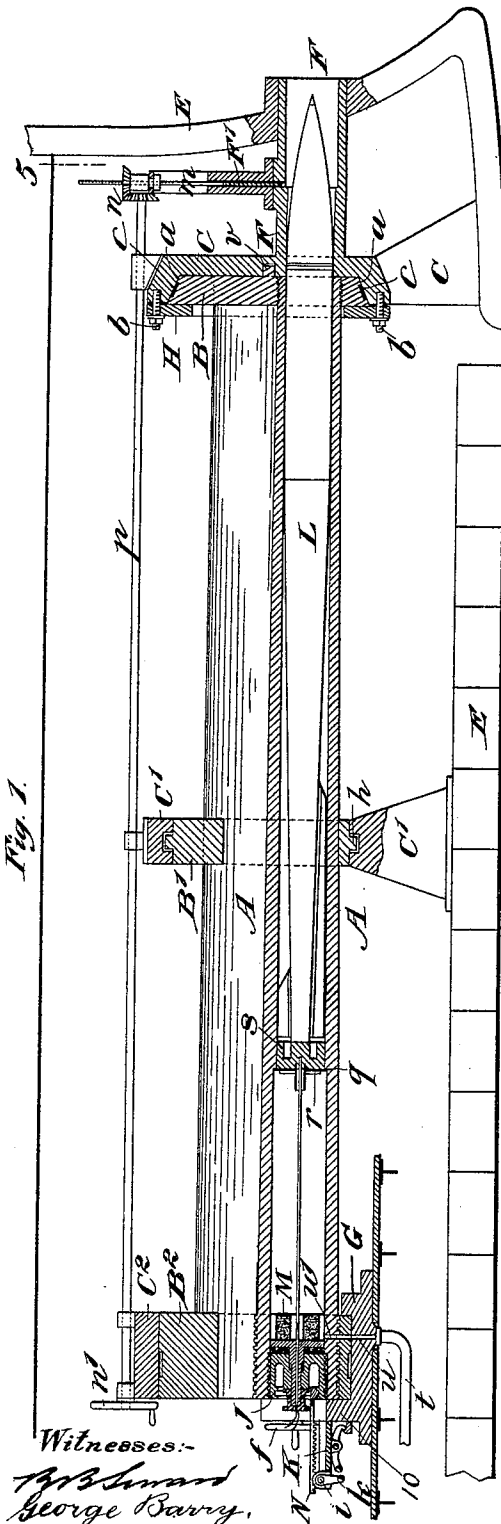
(No Model.)

3 Sheets—Sheet 1.

G. E. HESSE & N. G. DE FOCH.
SUBMARINE GUN.

No. 582,352.

Patented May 11, 1897.



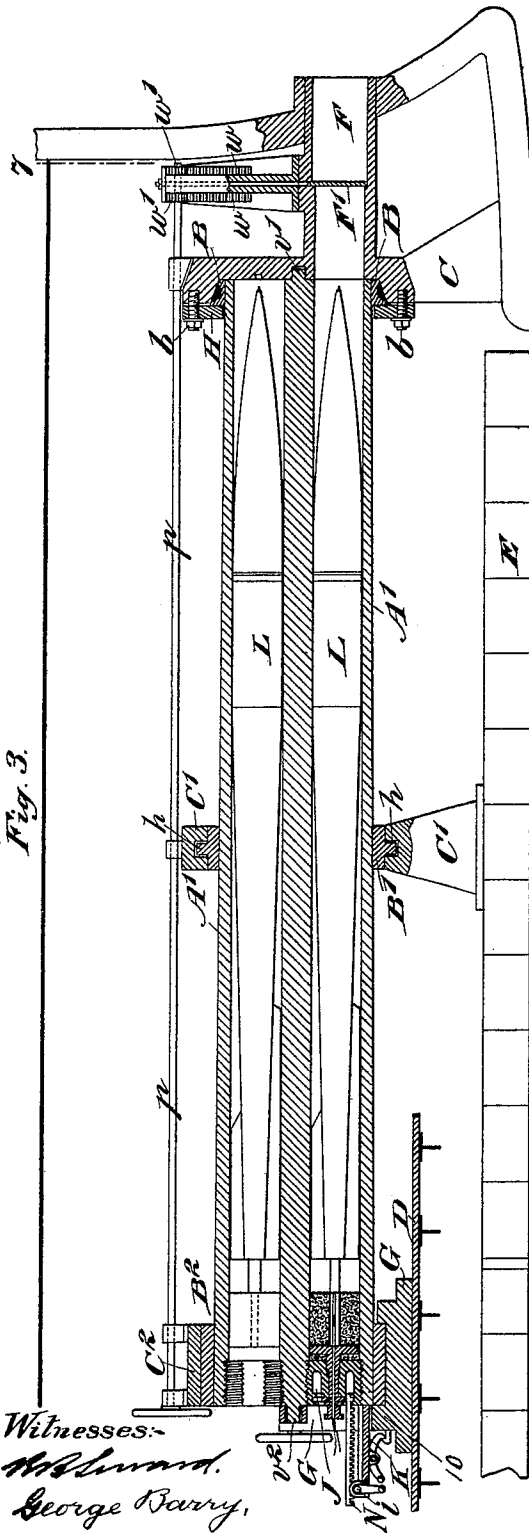
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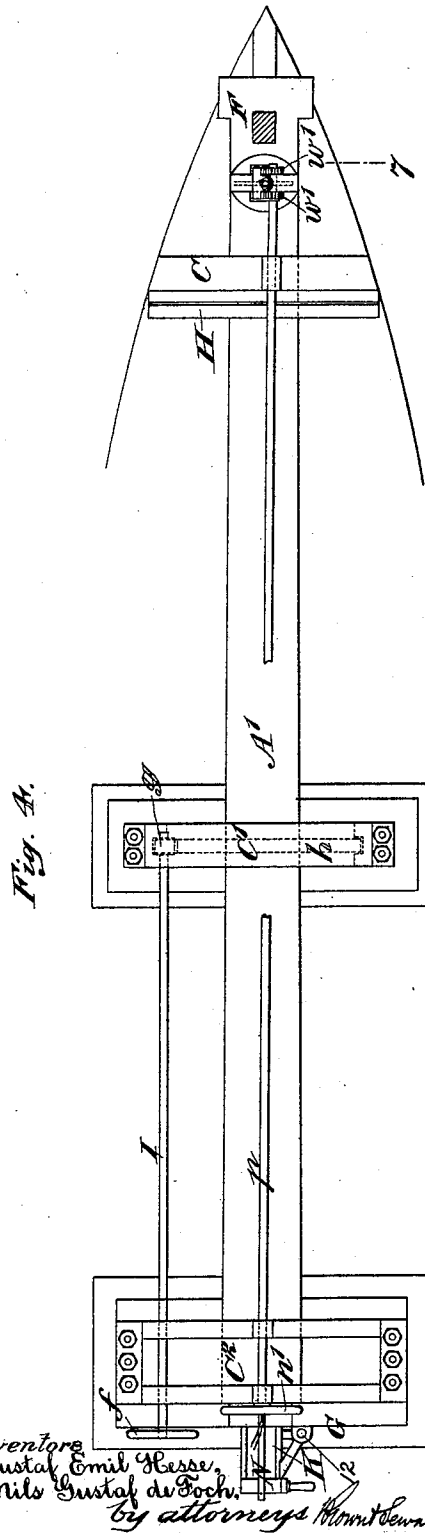
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Witnesses:-
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 George Barry.



Inventors
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(No Model.)

3 Sheets—Sheet 3.

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Fig. 5.

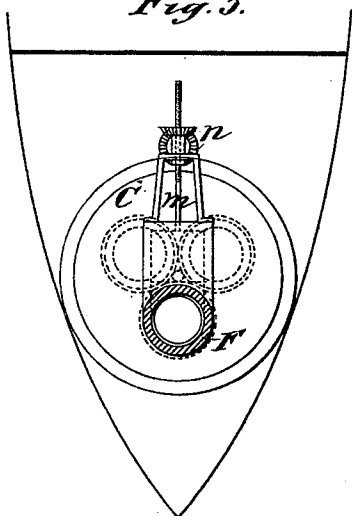


Fig. 1.

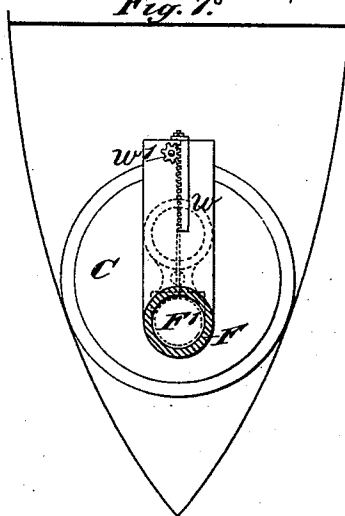


Fig. 6.

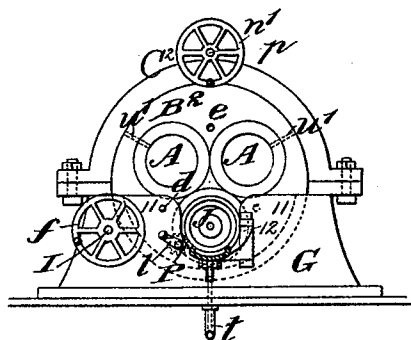
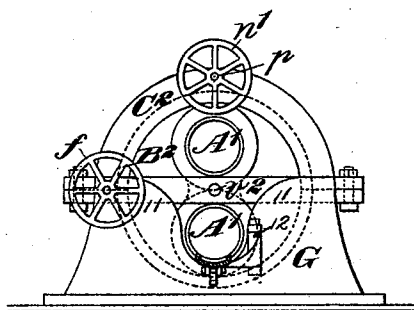


Fig. 8.



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UNITED STATES PATENT OFFICE.

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SUBMARINE GUN.

SPECIFICATION forming part of Letters Patent No. 582,352, dated May 11, 1897.

Application filed August 3, 1895. Serial No. 558,106. (No model.) Patented in England August 13, 1895, No. 15,229; in France August 13, 1895, No. 249,612, and in Germany September 7, 1895, No. 87,951.

To all whom it may concern:

* Be it known that we, GUSTAF EMIL HESSE and NILS GUSTAF DE FOCH, residing in the city of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Submarine Guns, of which the following is a specification, and for which we have obtained patents in the following countries, viz: England, No. 15,229, dated August 13, 1895; France, No. 249,612, dated August 13, 1895, and Germany, No. 87,951, dated September 7, 1895.

This invention consists, mainly, in certain combinations, hereinafter described and claimed, whereby two or more connected breech-loading gun-barrels arranged to revolve around a common center are adapted to a vessel for firing one after another under water through the bow or wall of the vessel. We will first describe our invention in detail with reference to the accompanying drawings and afterward point out its novelty in claims.

Figure 1 of the drawings represents a central vertical longitudinal section of a submarine gun having three barrels and of the forward part of a vessel to which said gun is fitted for firing through the bow; Fig. 2, a plan view of the gun and the bow of the vessel. Fig. 3 represents a central vertical longitudinal sectional view of the forward part of a vessel and of a submarine gun thereon having only two barrels. Fig. 4 is a plan view corresponding with Fig. 2. Fig. 5 represents a transverse section taken in the line 5 5 of Figs. 1 and 2; Fig. 6, a rear view of the gun and its frame corresponding with Figs. 1, 2, and 5. Fig. 7 represents a transverse section taken in the line 7 7 of Figs. 3 and 4; Fig. 8, a rear view of the gun and its frame corresponding with Figs. 3, 4, and 7.

Similar letters and numerals of reference designate corresponding parts in all the figures.

We will first describe the invention with reference to Figs. 1, 2, 5, and 6.

A A A are the gun-barrels, which are arranged parallel with each other and held together by strong encircling disks, bands, or

yokes B B' B², of steel or other metal, of circular form, the said barrels being arranged with the center lines of their bores at equal distances from the common axis of said disks or yokes, about which the barrels are arranged to revolve, and at equal distances apart in a circle concentric to said common axis.

C C' C² designate the gun-frame, in which the gun-barrels, with their disks, bands, or yokes B B' B², revolve. This frame is represented as consisting of three standards C C' C², of iron or steel, containing bearings for the said disks, bands, or yokes, the standards C C' being represented as built up from the keel or keelson of the vessel E, and the aftermost standard being represented as set up on a deck D, from which the gun is to be worked. The foremost standard C has cast or forged with or otherwise firmly secured to it a fixed muzzle F, which is common to all of the barrels and which is built into and projects through the bow of the vessel below the line to which the vessel is submerged for service and at such distance below the axis about which the gun-barrels revolve that the barrels may be successively brought opposite to the fixed muzzle and there secured by a sliding pin *d*, inserted through a hole in the cradle G, which is formed at the bottom of the rearmost standard C², and through the proper one of the three holes *e* provided in the rearmost disk or yoke B².

The foremost disk or yoke B is represented as fitted to a taper seat or bearing *a*, provided for it in the standard C, and as held up to said seat or bearing by means of a ring H, which is bolted to the said standard by screw-bolts *b* and which overlaps said disk or yoke B. Between the seat *a* and ring H there is a packing *c* to serve as a gas-check. This ring H may serve to receive in part the recoil, though that is received mainly by the cradle G, which is formed in the base or lower portion of the rearmost standard C², and portions of which project upward, as shown at 10 in Fig. 1 and at 11 11 in Fig. 6, in rear of the rear disk or yoke B², the said cradle thus constituting a recoil-block. The foremost disk

or yoke is represented as furnished with a pivot v , which enters a bearing in the standard C.

The revolving of the barrels may be effected by any suitable power—as, for example, an electric motor—but we have represented for that purpose a hand-gear consisting of a shaft I, mounted in bearings on the standards C' C² and furnished with a hand-wheel f , to be worked from the deck D, and with a pinion g , gearing with teeth h , provided around the disk or yoke B'.

A single breech-block J is provided for all the barrels, being inserted in each one in its turn. This breech-block is represented in Figs. 1 and 3 as externally screw-threaded and fitted to screw-threaded seats in the barrels, the screw-threads on said block and in said barrels being respectively mutilated at intervals, so that the block may be pushed directly into and withdrawn from the barrels and screwed up thereinto and unscrewed therefrom by a partial revolution. This kind of block being so well known requires no further description.

K designates the carrier (represented as a tray) in which the said block slides to and from the barrels and by which the said block when withdrawn is swung aside to permit the insertion into the barrels of the projectiles L and the cases M, containing the powder by which they are discharged, the said tray being hinged to the recoil-block by a hinge 12.

N is the toothed rack attached to the breech-block and gearing with a pinion on a shaft i , which is fitted to the tray and turned by a crank k to move the block to and from the barrels.

P is the pinion engaging with teeth (not shown) on the breech-block and worked by a hand-crank l for the purpose of turning the said block.

The muzzle F is fitted with a sliding valve F' inside the vessel for the purpose of shutting out the water at all times but when the gun is to be got ready for discharging the projectile, when the latter is pushed forward in the barrel and into the muzzle, as shown in Fig. 1. This valve may be operated by any suitable motor or mechanism. In Figs. 1, 2, 5, and 6 the operating mechanism represented consists of a screw m , worked by bevel-gearing n , and a horizontal shaft p , which works in bearings on the standards C' C², and furnished with a hand-wheel n' within reach of the deck D.

In the gun shown in Figs. 1, 2, 5, and 6 the barrels are counterbored a considerable distance in front of the breech-seat to a caliber a little larger than that of the rest of the barrel to which the projectile is fitted, the counterbore terminating in a shoulder q , as shown in Fig. 1, and forming an air-chamber to prevent injurious local pressure on the gun at the time of firing. To the said counterbore is fitted a metal disk r , which is attached to

a piston s , which is of a size to fit the barrel in front of the counterbore.

To provide, before firing the gun, for pushing the projectile forward in the barrel for the two purposes of entering it into the fixed muzzle F and of obtaining the full capacity of the air-chamber, there is a pipe t , by which compressed air from a reservoir or compressor is introduced into the chamber through an inlet-aperture u in the cradle or recoil-block G and inlet-apertures u' , of which there is one to each barrel in front of the position which is reached by the face of the breech-block. The said openings u' are continued through the disk or yoke B² in such positions as to range with the aperture u when the barrels are respectively in position for firing. When a barrel has been brought to this position and locked by the pin d and has received the projectile and the powder-case and the breech-block has been properly placed and secured in its seat in the said barrel and the valve F' has been opened, the pipe t is opened, and the compressed air being thus introduced to the said barrel forces the piston, and with it the projectile, as far forward as permitted by the disk r , which is stopped by the shoulder q , as shown in Fig. 1, holding back the piston. The said disk, though strong enough to bear the pressure of the compressed air, is destroyed by the force of the powder in the discharge of the gun, from which it is driven out with the piston after the projectile.

The foregoing description will, so far as the same letters are used in the drawings Figs. 1, 2, 5, and 6, illustrating one example of our invention, and the drawings Figs. 3, 4, 7, and 8, illustrating the other example, apply to both examples, and with regard to the last-mentioned example we will now briefly describe those features in which it differs from the first example.

The two revolving-gun barrels A' A' are represented as made in the same body of metal, which is furnished at the ends with central pivots v' and v'' , the pivot v' turning in a bearing in the foremost standard C and the pivot v'' in a bearing carried by the cradle G. The valve F' is represented as operated by means of two toothed racks w , attached to the said valve, and pinions w' on the shaft p . The piston s and the means for introducing compressed air into the gun-barrels are dispensed with, an air-chamber being formed directly behind and around the taper rear part of the projectile and the projectile being intended to be pushed forward by a rammer or other suitable means.

What we claim as our invention is—

1. The combination of a vessel, two or more connected breech-loading gun-barrels arranged to move around a common center within the vessel, a fixed muzzle arranged in the bow or wall of the vessel and common to all of said barrels, a recoil-block stationary within the vessel and common to all of said barrels, one breech-block common to the sev-

eral barrels, and a carrier by which said breech-block is attached to said recoil-block and in which it is movable to and from the barrels, substantially as herein described.

- 5 2. In a submarine gun, the combination of two or more revolving gun-barrels, one muzzle common to all of said barrels, one removable breech-block common to all of said barrels, each of said barrels having an air-inlet
10 forward of the position reached by said breech-block, an encircling yoke connecting said barrels near their breeches and having air-inlets corresponding with those in the barrels,

a cradle which constitutes a bearing for said yoke and which has an air-inlet with which 15 the said inlets in the yoke and barrels severally range and means of introducing compressed air to said inlet in the cradle, substantially as and for the purpose herein described.

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