

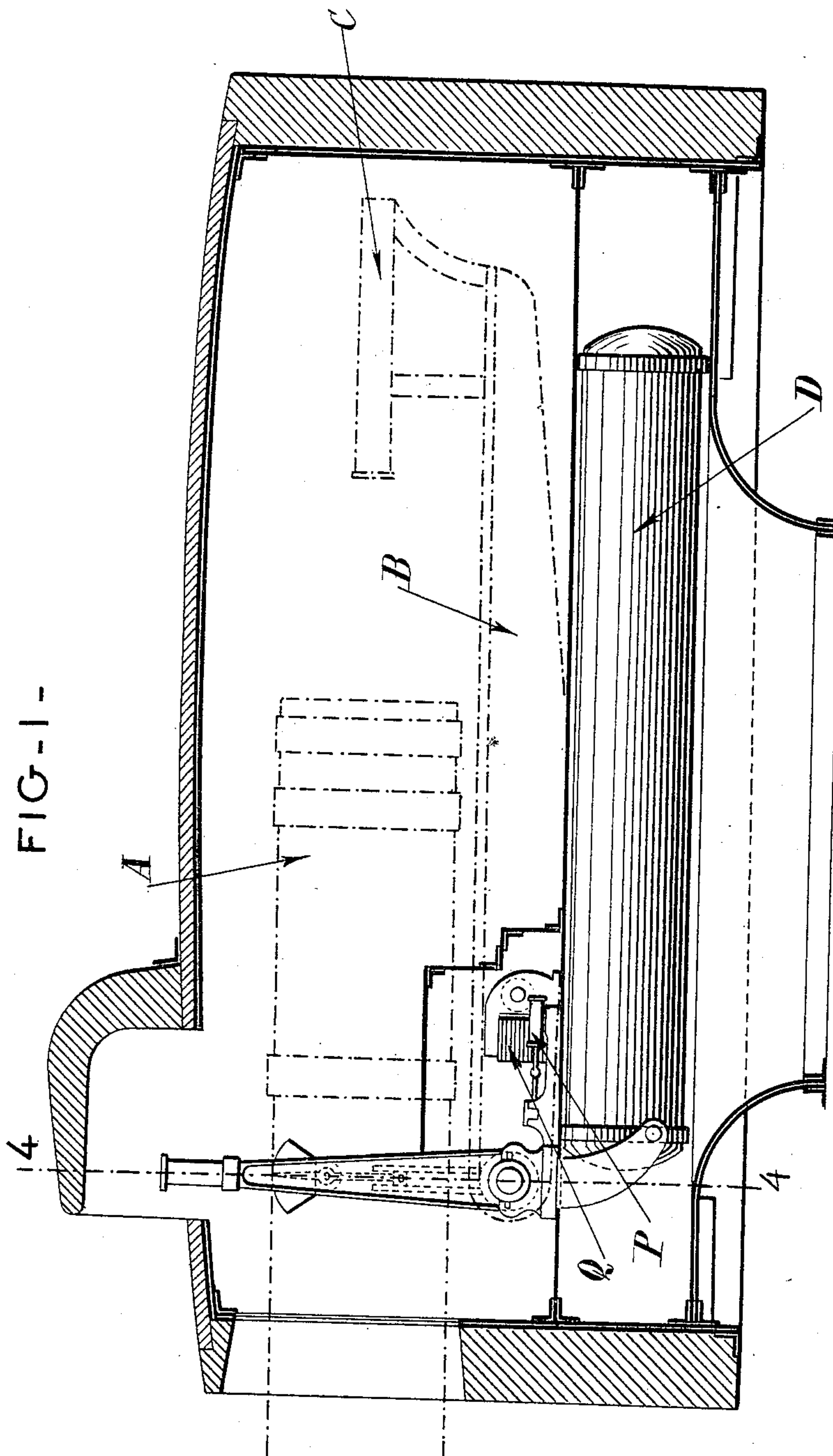
(No Model.)

6 Sheets—Sheet 1.

J. A. DEPORT.
REVOLVING GUN TURRET.

No. 565,610.

Patented Aug. 11, 1896.



WITNESSES:
Fred White
Thomas F. Wallace

INVENTOR:
Joseph Albert Deport
By his Attorneys:
Arthur C. Orser

(No Model.)

6 Sheets—Sheet 2.

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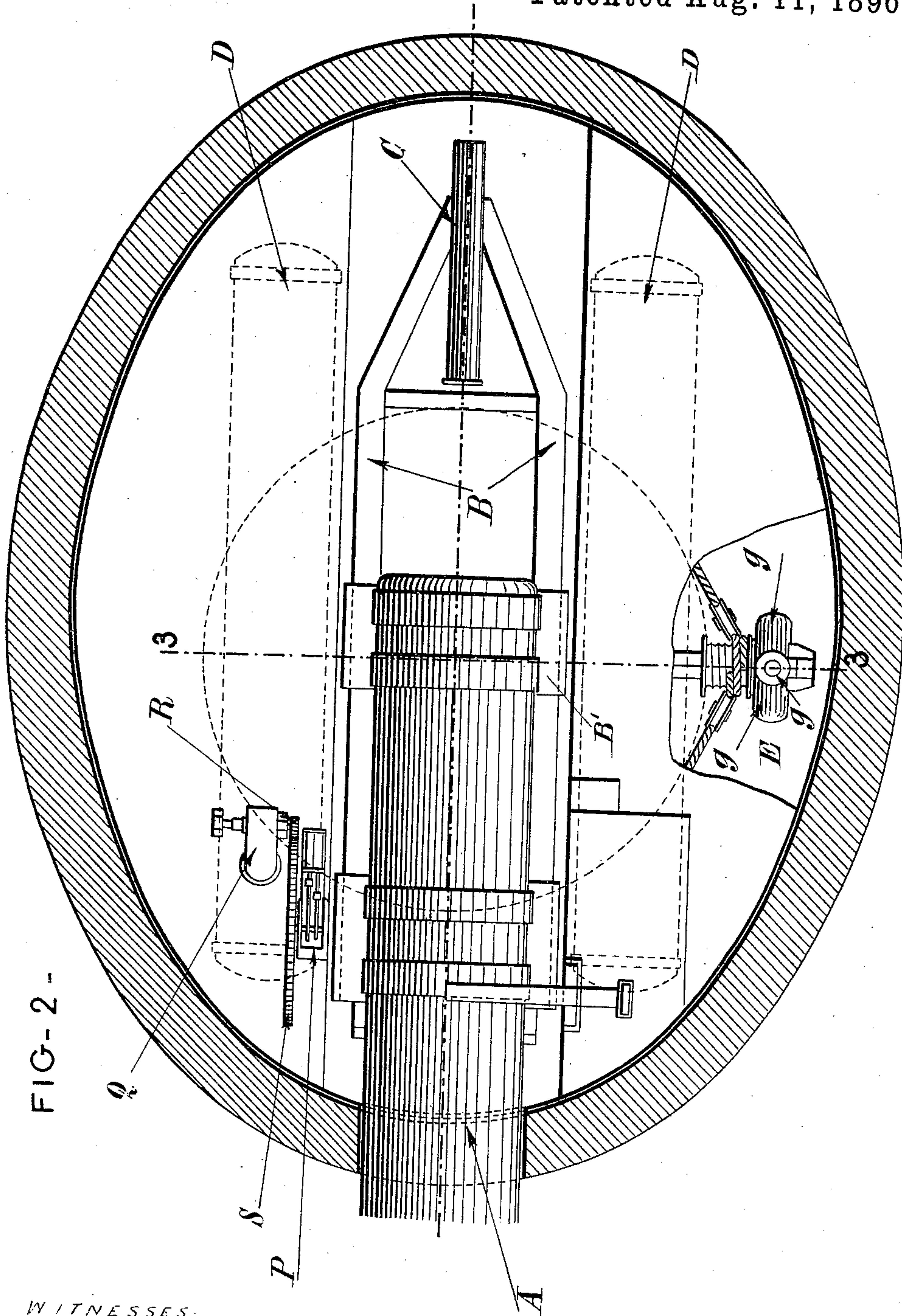


FIG-2 -

WITNESSES:

Fred White
Thomas J. Wallace

INVENTOR:

Joseph Albert Deport,
By his Attorneys:

Arthur C. Fraser & Co.

(No Model.)

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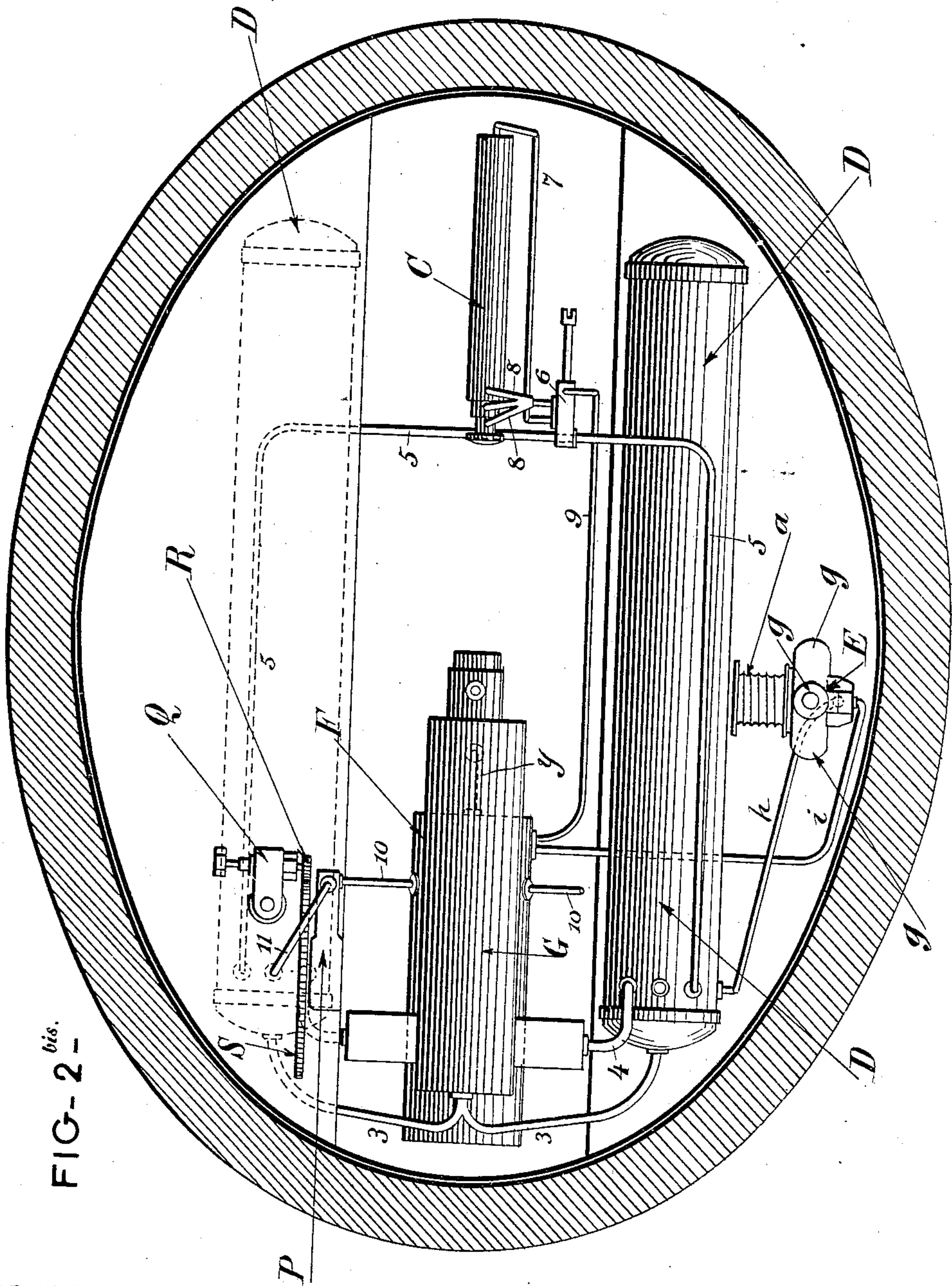


FIG-2-
bis.

WITNESSES:

Fred White
Thomas F. Wallace

INVENTOR:

Joseph Albert Deport,
By his Attorneys:

Butler G. Dixon & Co.

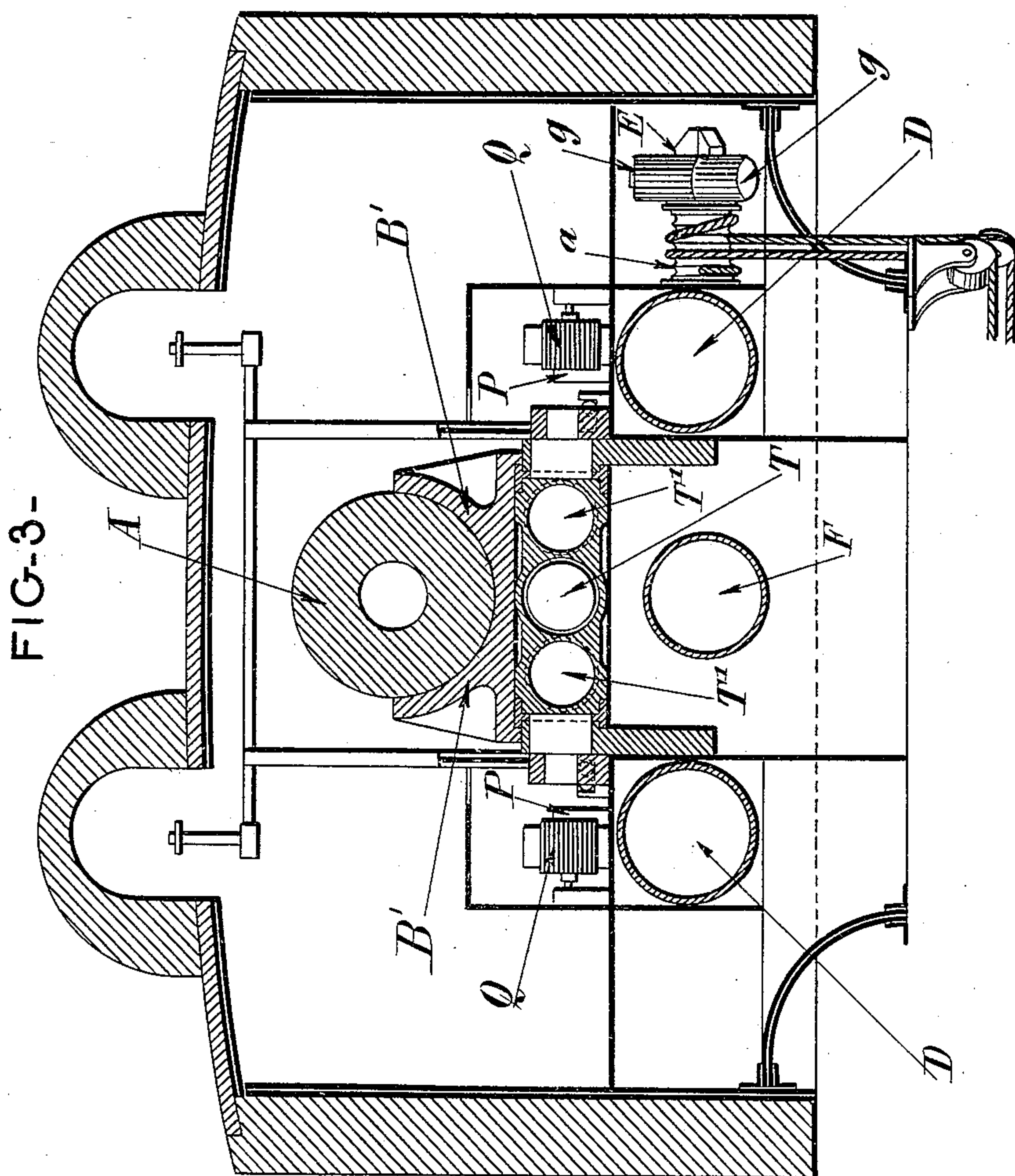
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WITNESSES:

Fred White

Thomas F. Wallace

INVENTOR:

Joseph Albert Deport,

By his Attorneys:

Arthur G. Orner & Co.

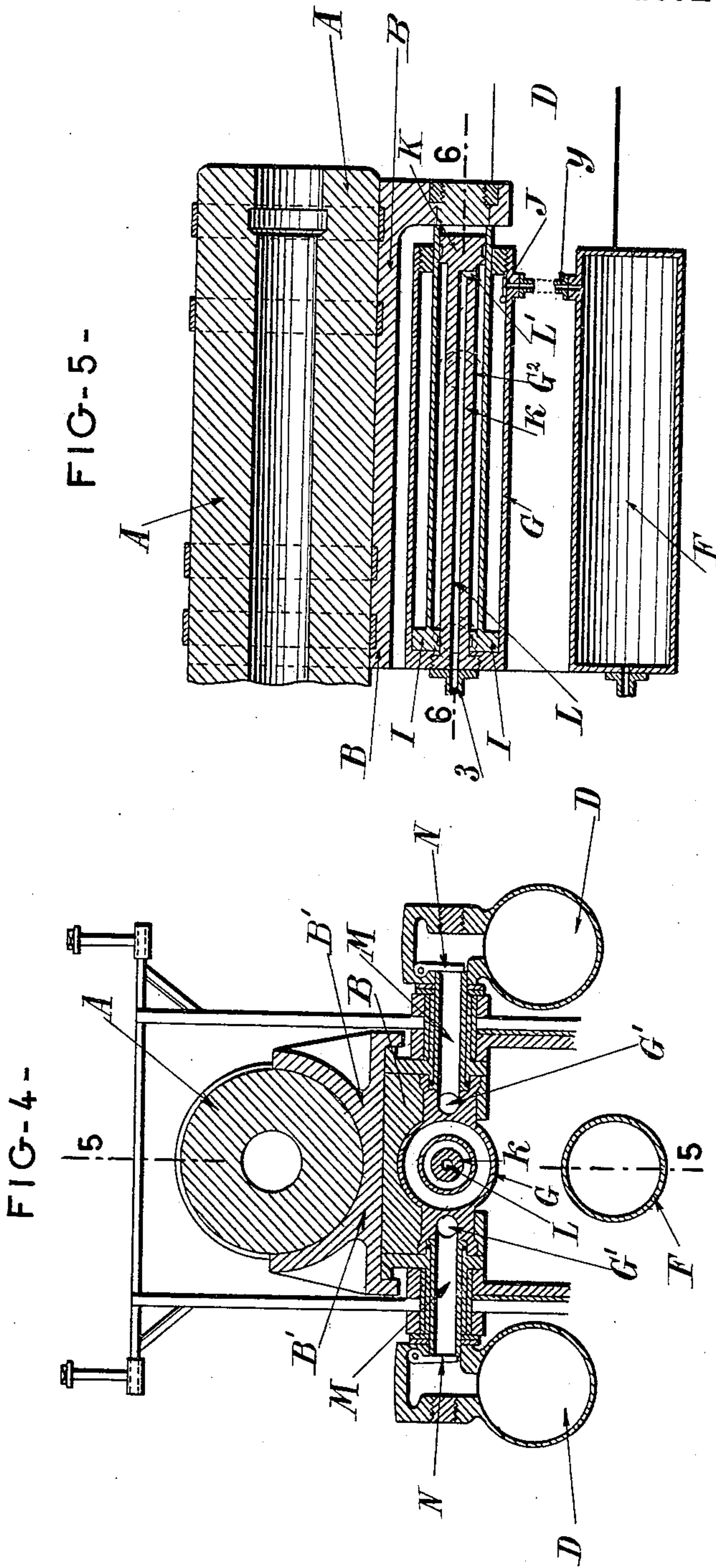
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WITNESSES:
Fred White
Thomas J. Wallace

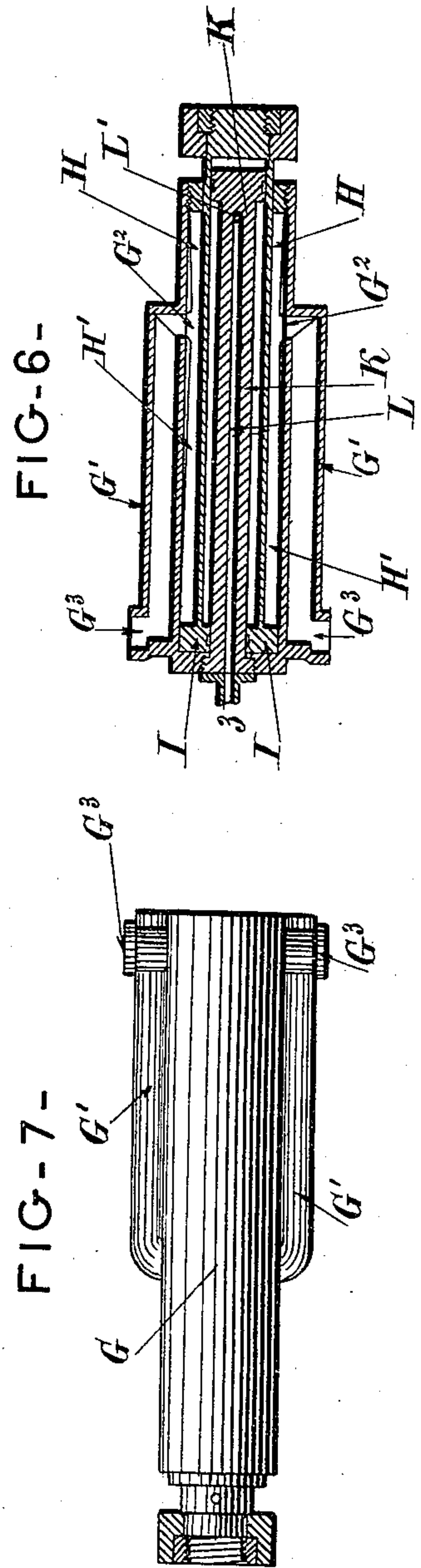


FIG-6-

FIG-7-

INVENTOR:
Joseph Albert Deport,
By his Attorneys
William C. Draper & Co.

(No Model.)

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FIG-8-

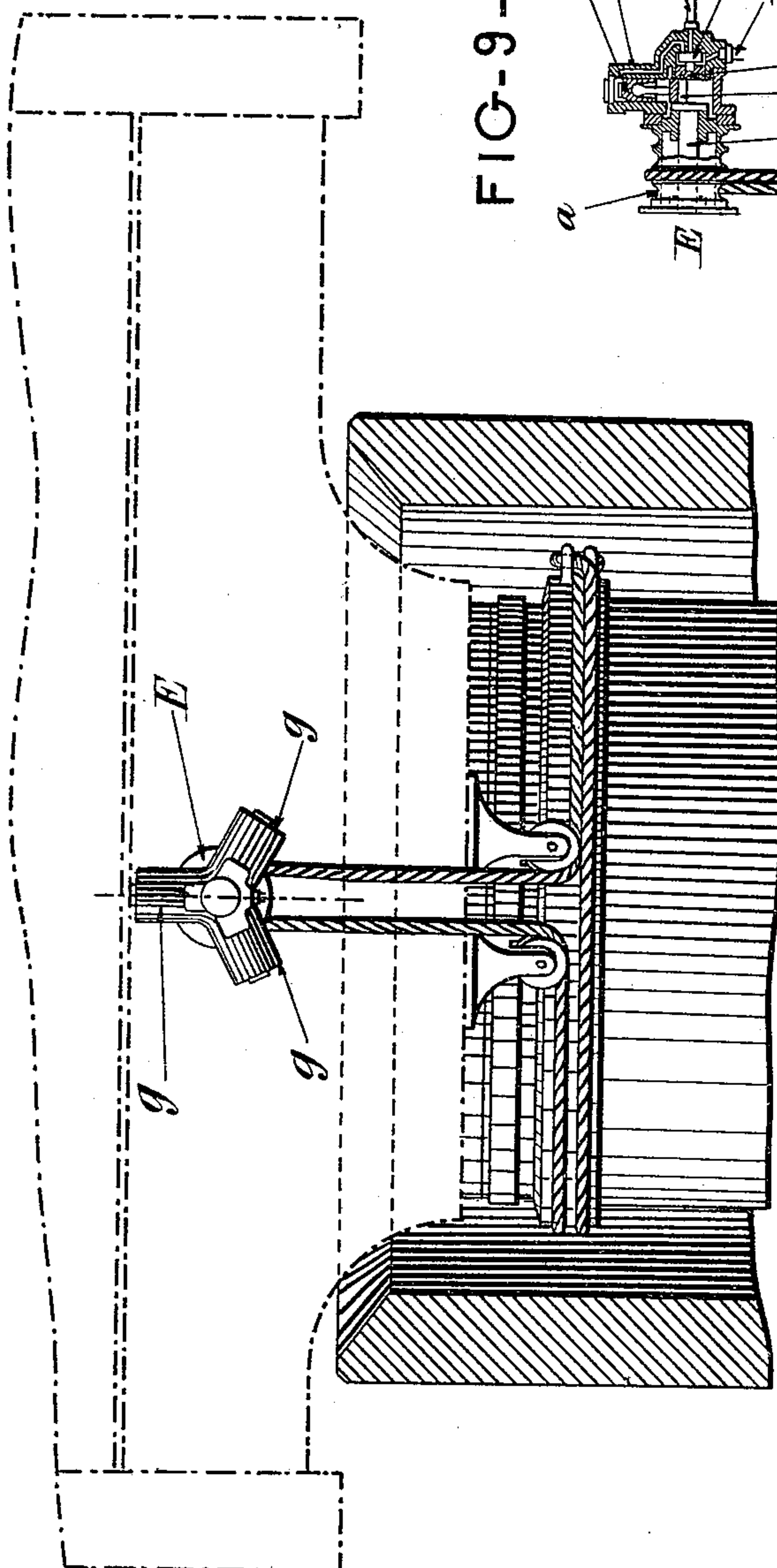
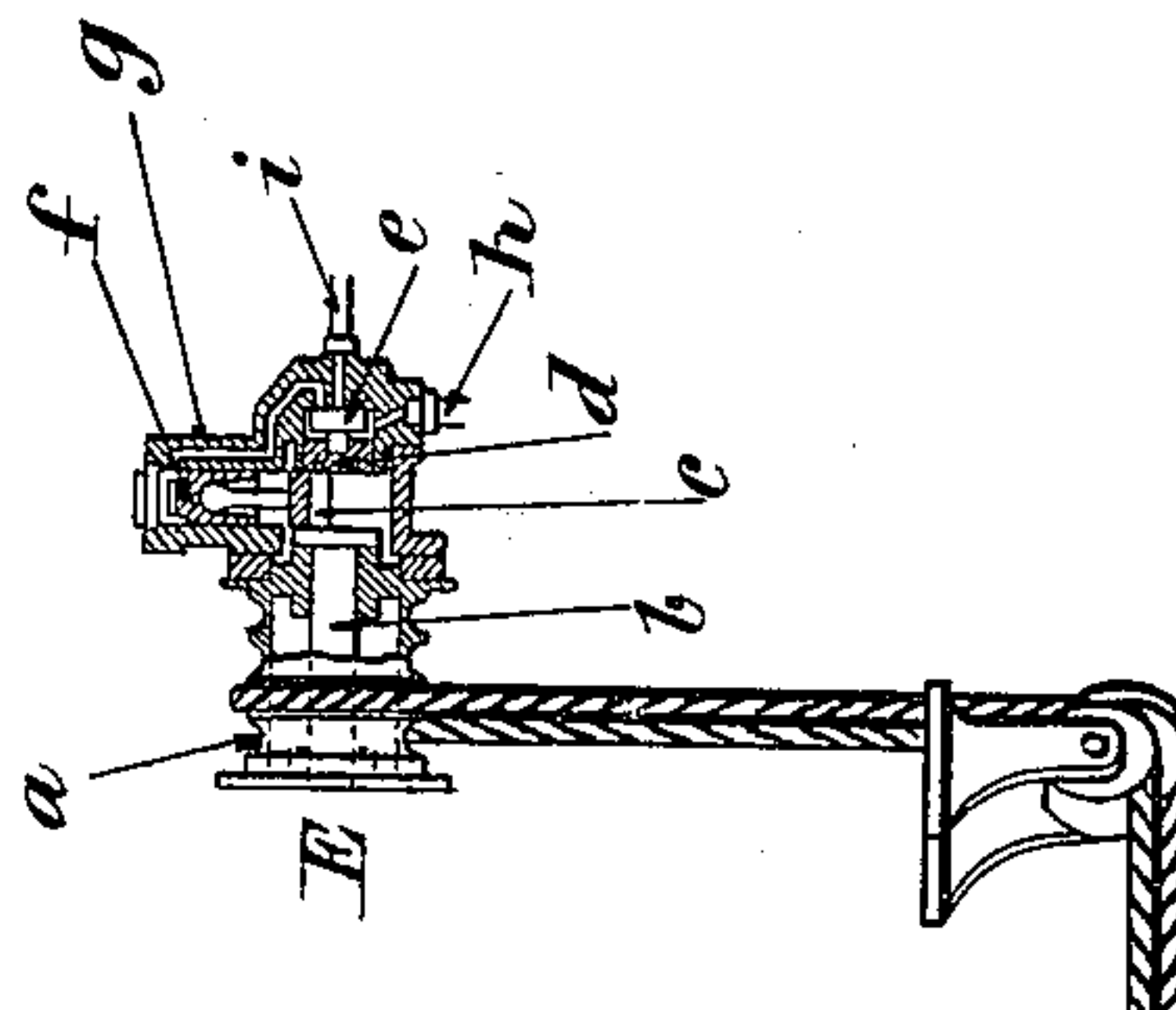


FIG-9-



WITNESSES:

Fred White
Thomas F. Wallace

INVENTOR:

Joseph Albert Deport,
By his Attorneys:
Arthur B. Oranger & Co.

UNITED STATES PATENT OFFICE.

JOSEPH ALBERT DEPORT, OF PARIS, FRANCE.

REVOLVING GUN-TURRET.

SPECIFICATION forming part of Letters Patent No. 565,610, dated August 11, 1896.

Application filed January 16, 1896. Serial No. 575,703. (No model.) Patented in France May 15, 1895, No. 247,451, and in Belgium August 26, 1895, No. 117,156.

To all whom it may concern:

Be it known that I, JOSEPH ALBERT DEPORT, a citizen of the Republic of France, residing in Paris, France, have invented certain
5 new and useful Improvements in Revolving Gun-Turrets, of which the following is a specification.

This invention is the subject of patents in France, No. 247,451, dated May 15, 1895, and
10 in Belgium, No. 117,156, dated August 26, 1895.

According to my invention I provide revolving turrets of ships with hydropneumatic accumulators, placed by preference under the
15 floor of the movable platform, and designed to furnish by themselves the water under pressure necessary for maneuvering the turret and training and firing the gun for a certain number of discharges of the gun. The
20 recharging of these accumulators is assured either by the firing of the cannon by means of a hydraulic apparatus for utilizing the energy of the recoil, or by means of small pressure-pumps driven by dynamos fed by the
25 electric current supplying the ship, and which, by reason of the small dimensions that the use of the accumulators permits of giving them, may be stowed away compactly under an iron casing serving as the aiming-bench
30 without reducing the useful surface of the floor of the turret. I can thus utilize these two means for charging the accumulators, the recoil mechanism serving during the firing of the gun, and the pump acting for giving the
35 initial charge or whenever the ship executes evolutions without firing the gun.

Figure 1 is a longitudinal section of the turret, showing the contained mechanism in elevation. Fig. 2 is a horizontal section of the
40 turret, showing the contained mechanism in plan. Fig. 2^{bis} is a similar horizontal section cut in a lower plane. Fig. 3 is a transverse section on the line 3 3 in Fig. 2. Fig. 4 is a transverse section on the line 4 4 in Fig. 1.
45 Fig. 5 is a fragmentary longitudinal section on the line 5 5 in Fig. 4. Fig. 6 is a longitudinal horizontal section on the line 6 6 in Fig. 5. Fig. 7 is a plan of the cylinders shown in Fig. 6. Fig. 8 is a sectional elevation showing the hydraulic windlass. Fig. 9 is a sectional side view of the latter.
50

The drawings show the gun or cannon A carried by its sliding cradle B', which in turn slides on the gun-carriage B, the latter being provided at its rear part with a hydraulic rammer C. On each side of the gun-carriage, between the T-irons composing the structure of the platform, are arranged two accumulator-cylinders D D, Figs. 1 and 3, which contain a certain quantity of liquid compressed by air
55 under heavy pressure. From these accumulators extend conduits which conduct the water under pressure to the several hydraulic apparatus of the turret, notably the hydraulic windlass E, Figs. 2, 3, 8, and 9, which controls its rotation, and the telescopic rammer C. The water evacuated from these apparatus is drained into a reservoir or cistern F. From this reservoir F the liquid is pumped
60 back to the accumulators, as will be explained. This pumping back of the liquid is effected in two ways, principally by a hydraulic brake adapted for utilizing the energy of the recoil of the gun, and partly by the electric pumps, which I will describe.
65 70 75

The hydraulic recoil-brake is of the same class as those which constitute the object of my application for United States Patent filed May 31, 1895, No. 551,240. It is shown in transverse section in Fig. 4, in longitudinal
80 vertical section in Fig. 5, in horizontal longitudinal section in Fig. 6, and in plan in Fig. 7. This hydraulic brake is constructed with a cylindrical body G, having two lateral channels G', which communicate at G² with
85 the interior of the brake-cylinder at a suitable distance from the rear end thereof. In the interior of the brake-cylinder are formed some grooves or channels, (shown at H and H',) and which serve to suitably regulate the
90 resistance afforded by the brake to the recoil by permitting of the escape of liquid during the recoil, as well as during the return to battery. In the brake-cylinder moves a piston I, which in the particular construction shown is annular and has a hollow piston-rod I', so that it surrounds and slides
95 upon a central fixed piston-rod k, carrying a stationary piston K, which works in the movable cylinder constituted by the interior of the hollow piston-rod I'. This fixed
100 piston-rod is formed with a central channel

L, which by a lateral opening L' is in constant communication with the interior of the piston-rod I', forward of the piston K', and which by a conduit 3 is in constant communication with the accumulators. The conduits 3 and L thus put in permanent communication with the accumulators the annular space comprised between the fixed piston-rod K and the movable piston-rod I', and serves by the hydraulic pressure exerted against the movable piston I to return the gun to battery as soon as the recoil has spent itself.

From the rear end of the brake-cylinder G a tube γ extends to the waste-water reservoir F, shown as arranged beneath. A check-valve J, Fig. 5, is arranged to prevent any outflow through this tube and to open and permit a flow from the reservoir F into the brake-cylinder G during the return to battery.

The ends G³ of the passages G' communicate by a channel through the hollow axles M, Fig. 4, with the accumulators D D, check-valves N N being interposed to prevent any backflow from the accumulators toward the cylinder.

In Fig. 2^{bis} the connecting conduits are shown. Cylinder G is in permanent connection with accumulators D D through the pipes 3 3. The liquid expelled from the brake passes to the accumulators through pipes 4 4. The accumulators are connected by a pipe 5, which conducts the liquid under pressure to the controlling-valve 6 of the rammer C. From this valve the liquid passes either by a feed-pipe 7 to force out the ram, or by pipes 8 8 to return it. The exhaust-water flows by pipe 9 to the waste-reservoir F. From the accumulators a pipe h conducts the liquid to the hydraulic windlass E, and a pipe i conducts the waste from the latter to the reservoir F. The windlass-drum a , Fig. 9, is mounted on a shaft b , having a crank c , engaged by the rods of three pistons f , moving in the three cylinders g at one hundred and twenty degrees apart. The crank engages a piece d , carrying the rotary valve e . The water enters by pipe h to the valve, and the exhaust escapes by pipe i .

The entire system operates in the following manner when the cannon is fired: When the cannon is thrown back by the recoil, it carries with it the piston-rod I', (which is attached to it in the manner shown in Fig. 5,) so that the piston I in its backward movement forces before it the liquid in the brake-cylinder and expels it through the passages G' and M, past the valves N, into the accumulators D. During this movement the valve J remains closed. At the same time the liquid contained in the annular chamber between the piston-rod I' and the fixed rod K' is forced out likewise into the accumulators. As soon as the annular piston I has passed the orifices G³ the charging of the accumulators through the lateral tubes ceases, and the valves N N fall

back upon their seats. Afterward the liquid in advance of the piston can only flow around it by means of the grooves or channels H, which are formed of progressively-diminishing area in such manner as to gradually and certainly counteract the remaining energy of the recoil during the remaining portion of the movement of the piston. As soon as the recoil is terminated the cannon is returned to battery under the action of the piston I, of which the internal part is pressed upon by the liquid from the accumulators flowing through the channel L L', as has been already described. During this movement of return to battery the valve J opens and permits liquid to be drawn from the reservoir F through the tube γ into the brake-cylinder G for replacing that which was injected into the accumulators during the recoil. The charging of the accumulators D is thus maintained by the firing of the cannon, the liquid following a closed circuit.

When the ship executes evolutions without firing the gun, resort is had to the electric pumps for maintaining the charge in the accumulators. For this purpose over the head of each accumulator is placed a pressure-pump P, having two cylinders driven by an electromotor Q, which is connected to the electric circuit of the ship. On the axle of the revolving armature of the electromotor is fixed a pinion R, gearing with a large wheel S, which drives the pressure-pump. The liquid is drawn from the reservoir F through pipes 10 and is forced by the pumps P through pipes 11 into the accumulators.

Instead of constructing the hydraulic recoil-actuated brake with essentially two hydraulic cylinders arranged concentrically one around the other, as shown in Figs. 4 to 7, the arrangement shown in Fig. 3 may be substituted, where are shown at T the hydraulic brake and at T' T' the recoil-driven pump-cylinders, these latter being arranged on opposite sides of the brake-cylinder and having no longer any function in controlling the recoil or in returning the cannon to battery. By thus placing accumulators containing water under pressure under the floor or the platform of the turret, so as to supply the hydraulic apparatus for maneuvering the turret and operating gun, the turret is rendered independent in great measure of the remainder of the ship, and the certainty of its operation is greatly assured, since it contains in itself all the apparatus and all the motive energy necessary for its operation, except only to the extent that electric energy is at times drawn from the circuit of the ship for driving the motors Q.

Preferably the accumulators D D are hydropneumatic, the stored energy being effected by the compression of air, but in lieu thereof the storing of energy may be effected by any other compression as an equivalent.

I claim as my invention—

1. In an armored turret, the combination

with the gun and hydraulic mechanisms for revolving the turret and manipulating the gun, of a pressure-accumulator, a reservoir, a hydraulic recoil-cylinder, and valved passages leading from the reservoir to said cylinder, and from said cylinder to the accumulator, constructed and adapted during the recoil movement to force water from said cylinder into the accumulator, and during the return to battery to draw water from said reservoir into said cylinder.

2. In an armored turret, the combination with the gun and hydraulic mechanisms for revolving the turret and manipulating the gun, of a pressure-accumulator, a reservoir, a hydraulic recoil-cylinder, and valved passages leading from the reservoir to said cylinder, and from said cylinder to the accumulator, constructed and adapted during the re-

coil movement to force water from said cylinder into the accumulator, and during the return to battery to draw water from said reservoir into said cylinder, and an electrically-driven pump adapted to draw water from said reservoir and force it into said accumulator for initially charging the accumulator and for maintaining it charged when the hydraulic apparatus is operated without firing the gun, whereby the turret comprises in itself all the motor mechanism for effecting the operation of the turret and gun.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JOSEPH ALBERT DEPORT.

Witnesses:

CLYDE SHROPSHIRE,

JULES ARMENGAUD, Jeune.