(No Model.)

4 Sheets—Sheet 1.

W. D. STIVERS.

TURRET FOR WAR VESSELS.

No. 604,435. Patented May 24, 1898.

Fig. 1.

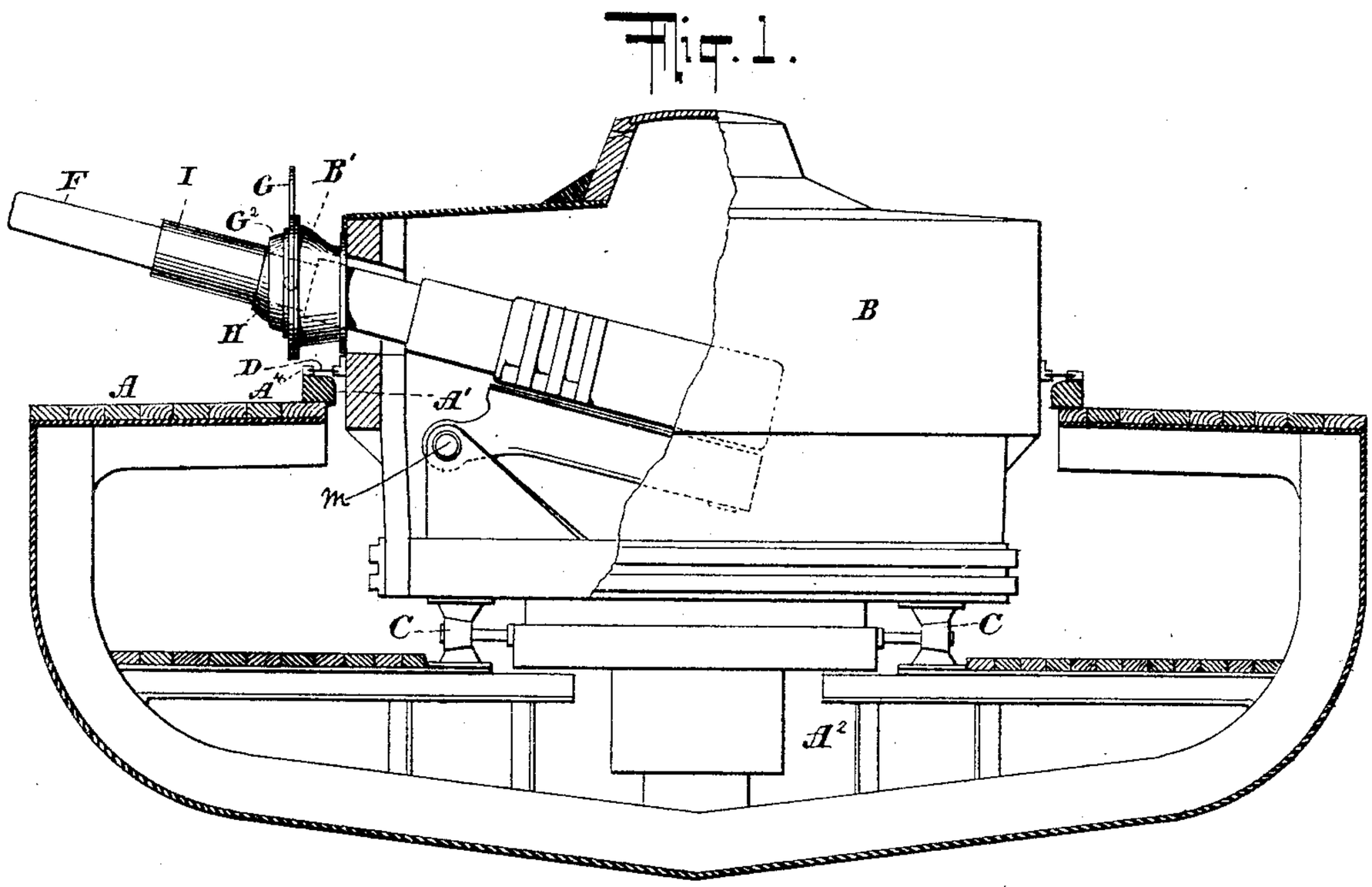
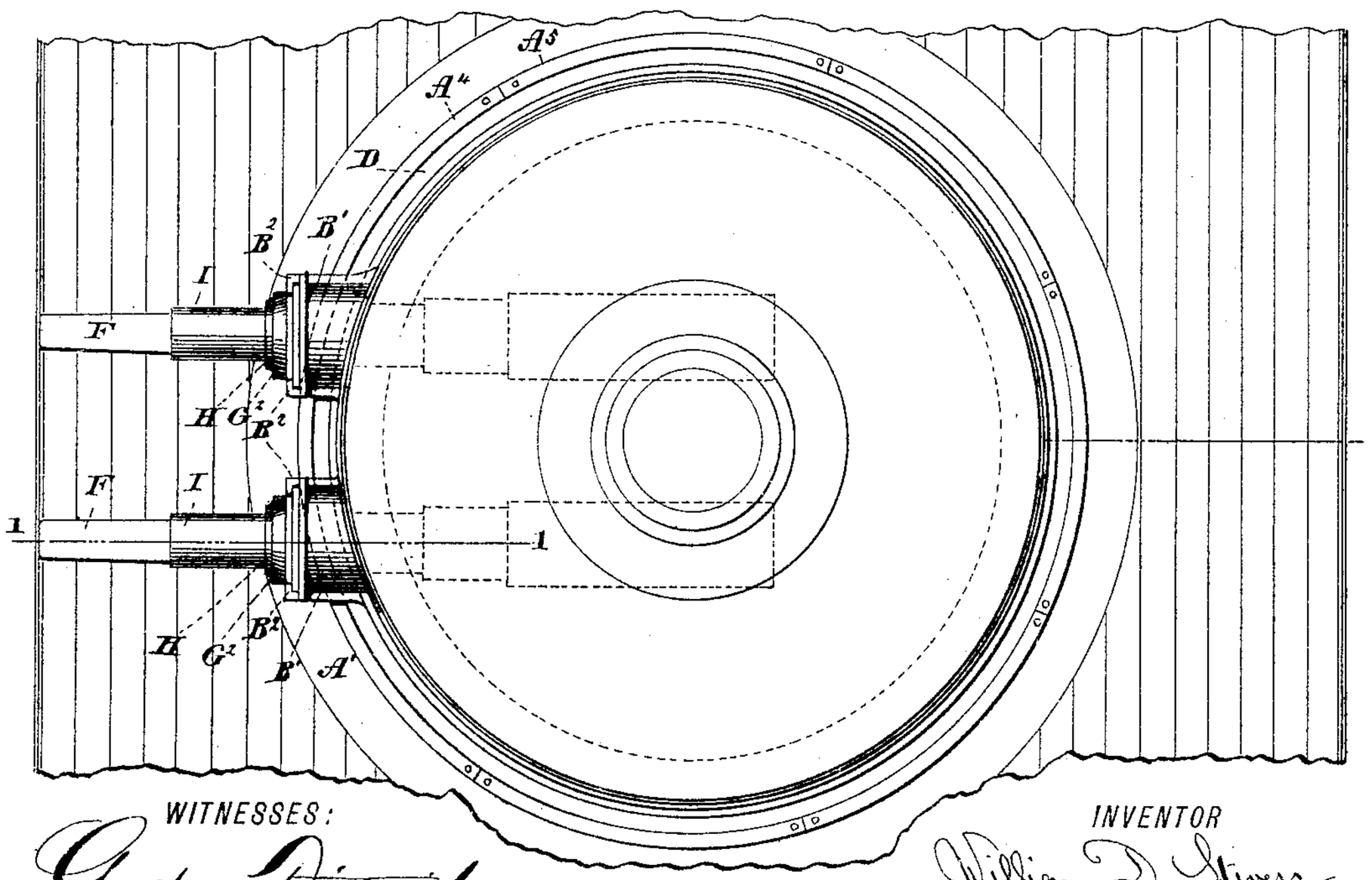


Fig. 2.



WITNESSES:

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(No Model.)

4 Sheets—Sheet 2.

W. D. STIVERS.

TURRET FOR WAR VESSELS.

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Fig. 5.

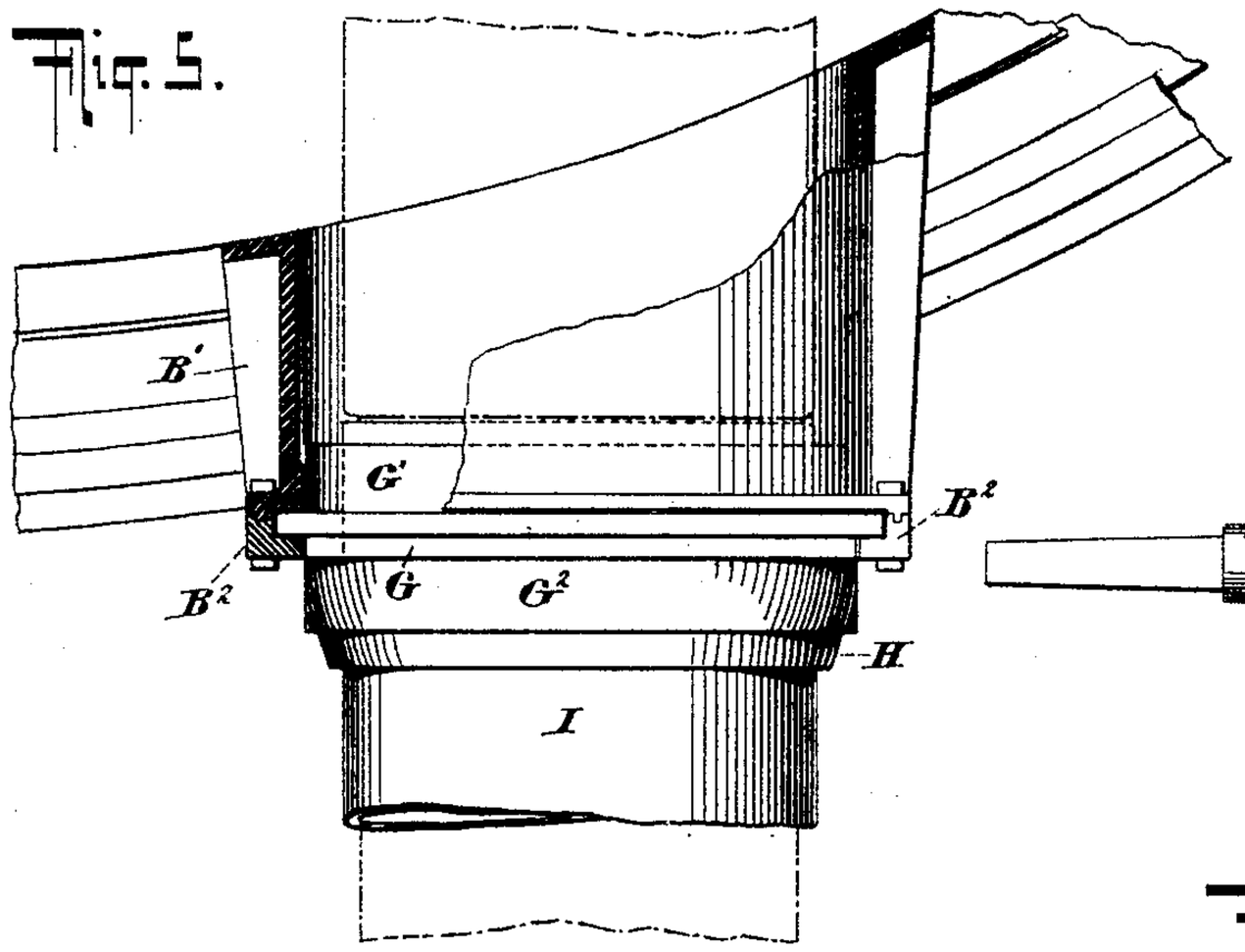


Fig. 13.

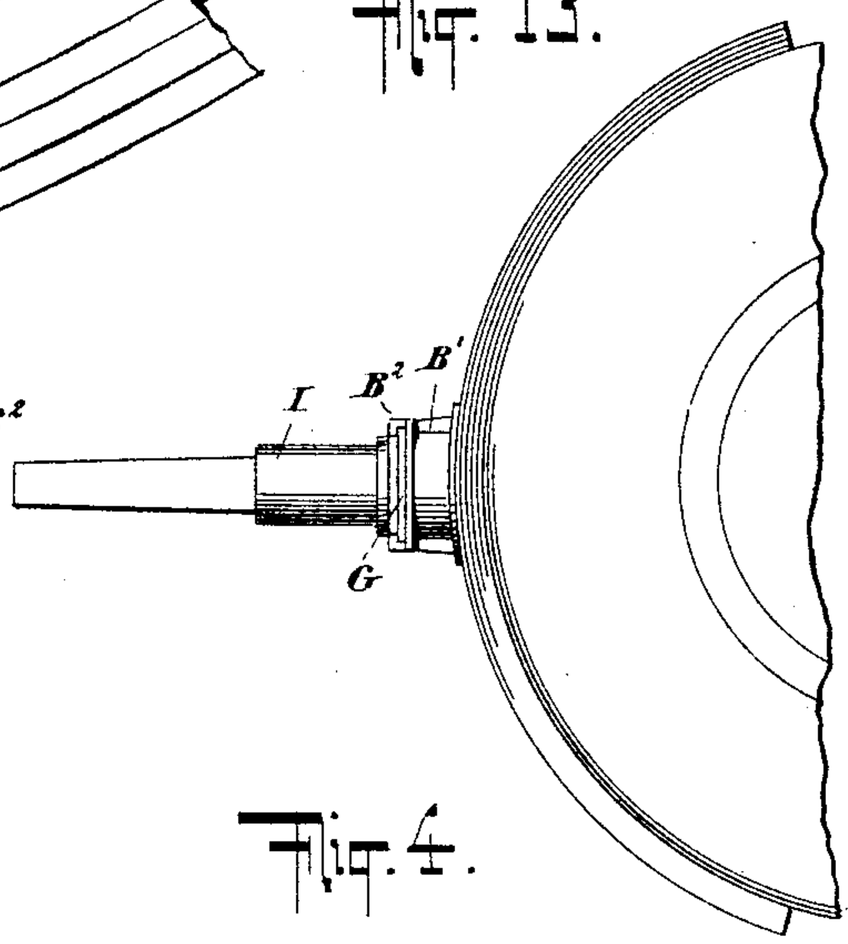


Fig. 3.

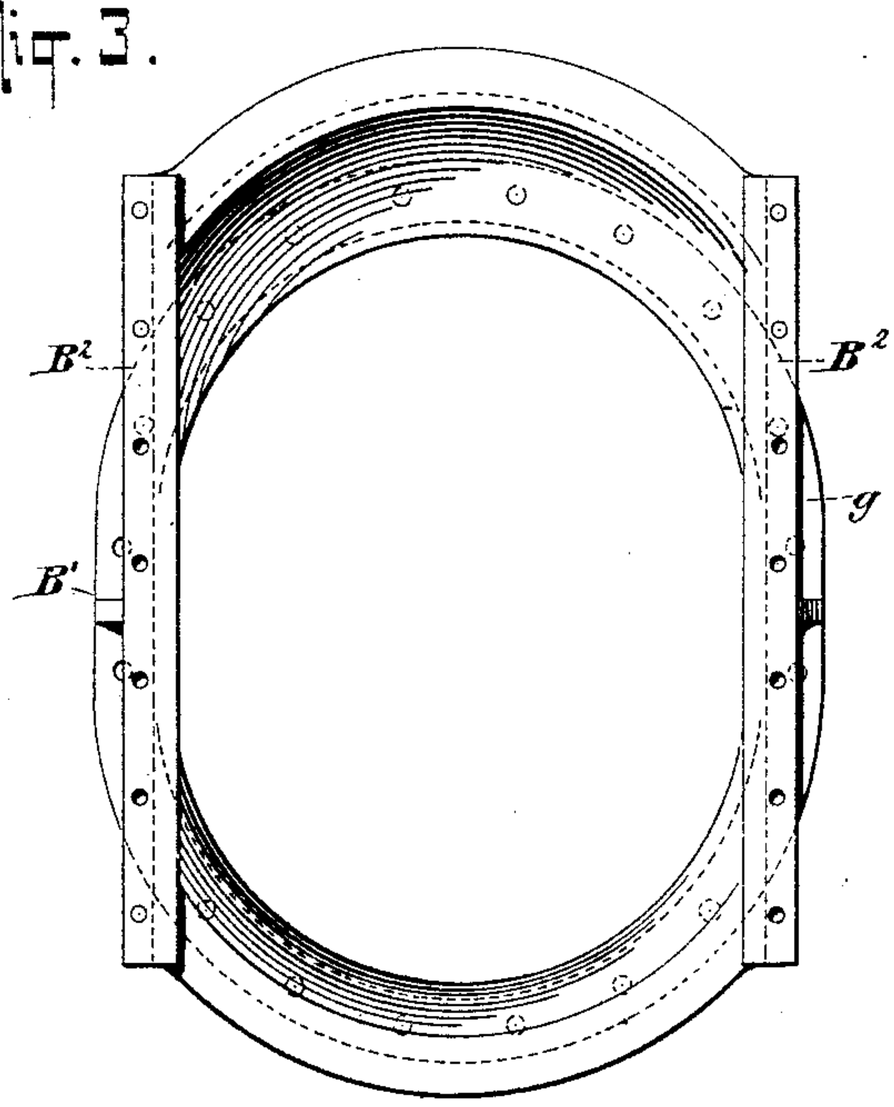
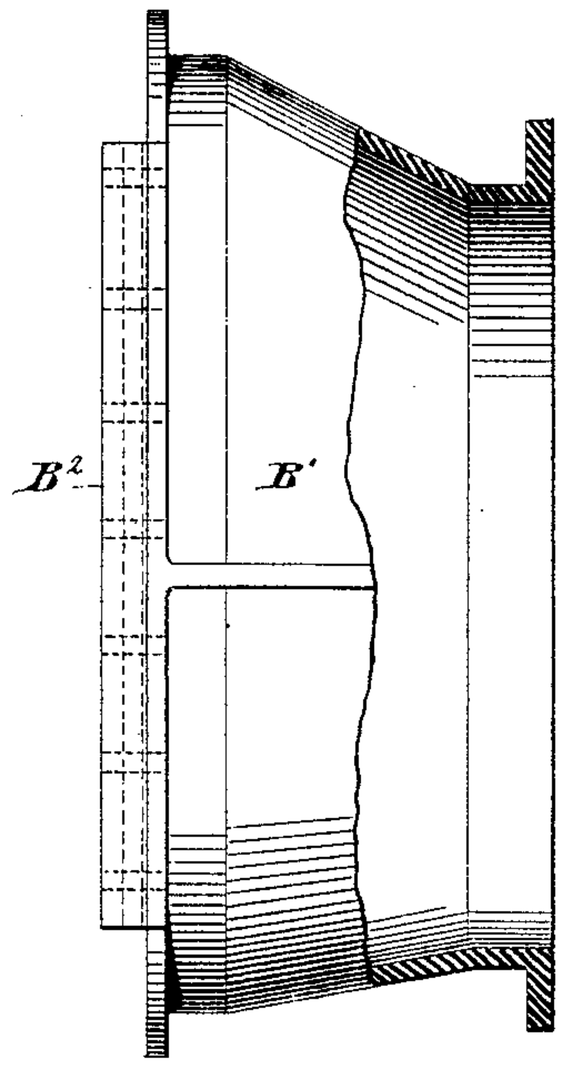


Fig. 4.



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4 Sheets—Sheet 3.

W. D. STIVERS.

TURRET FOR WAR VESSELS.

No. 604,435. Patented May 24, 1898.

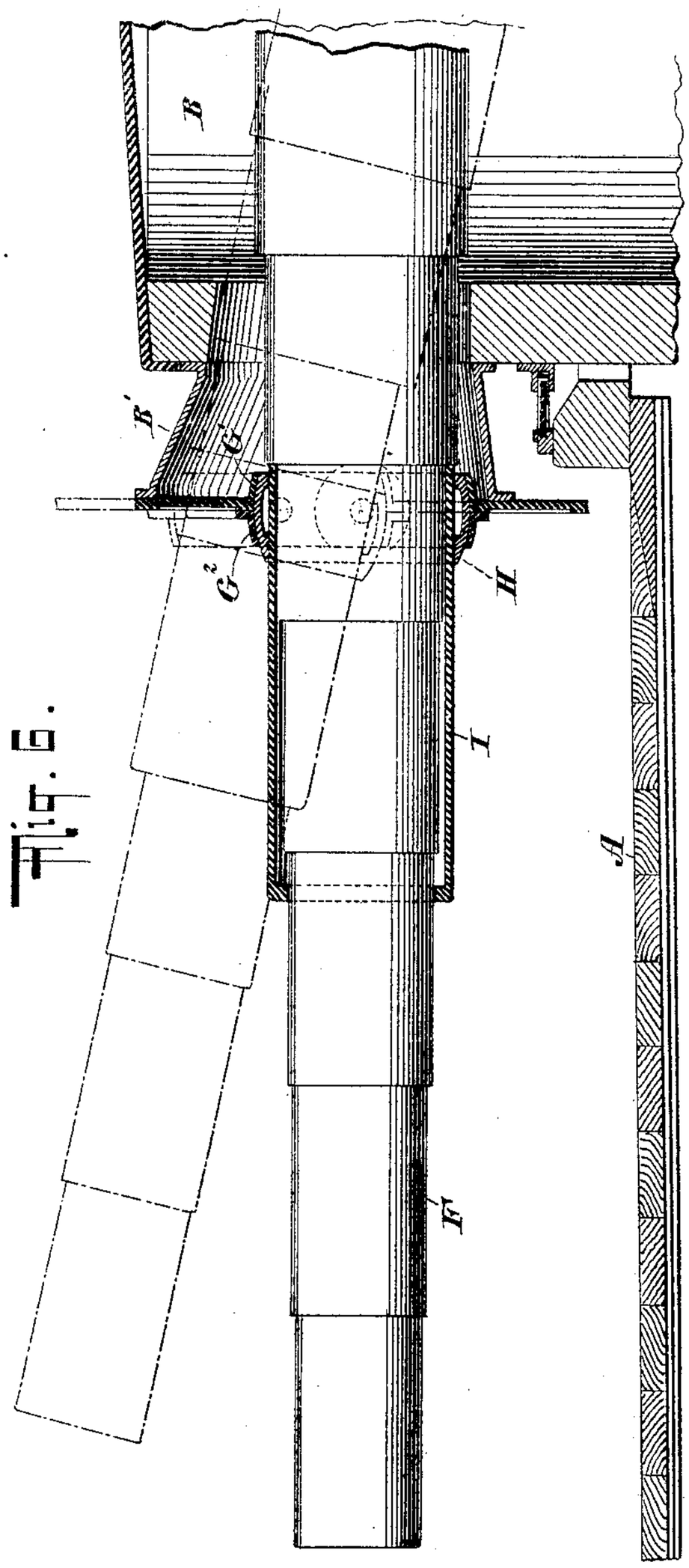

Fig. 6.

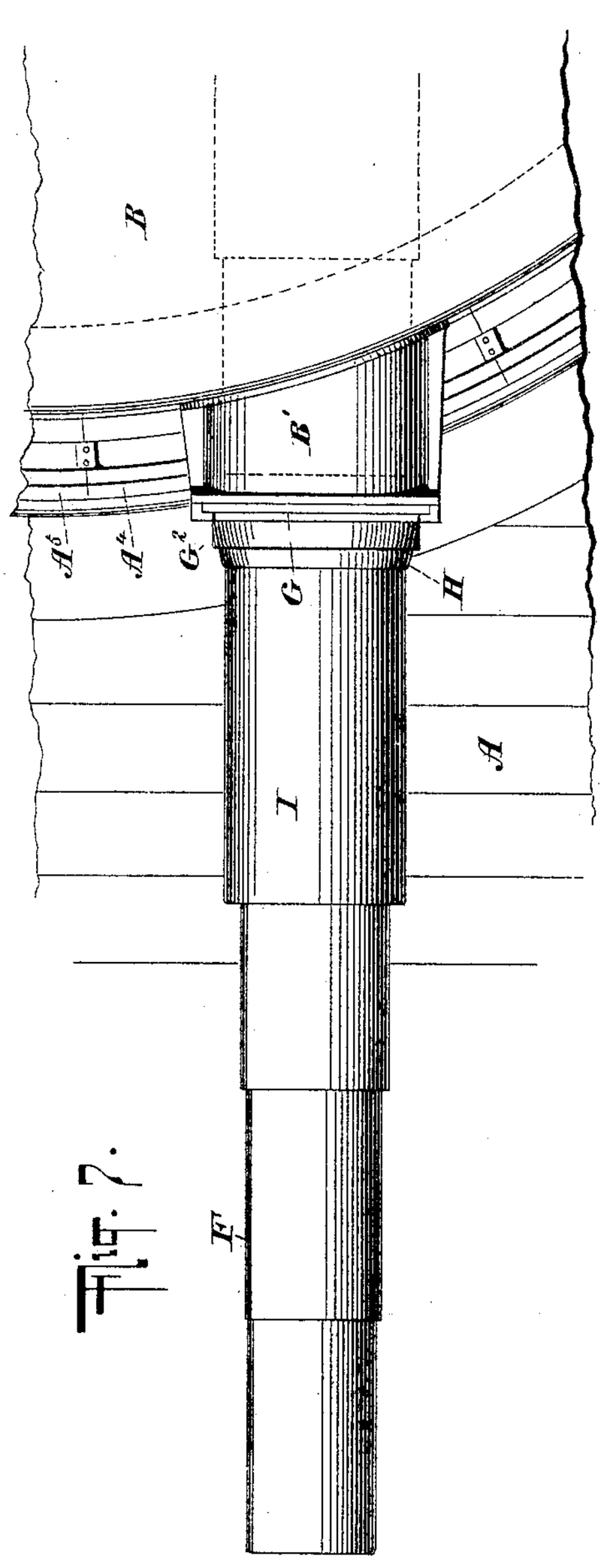

Fig. 7.

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4 Sheets—Sheet 4.

W. D. STIVERS.

TURRET FOR WAR VESSELS.

No. 604,435. Patented May 24, 1898.

Fig. 9.

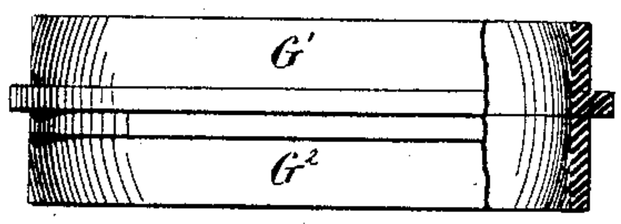


Fig. 10.

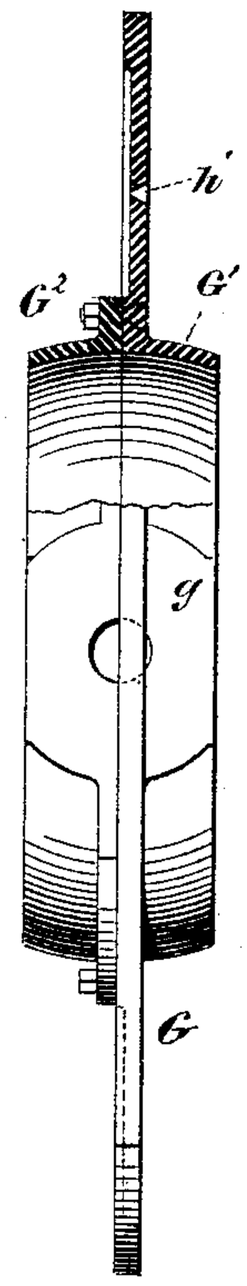


Fig. 8.

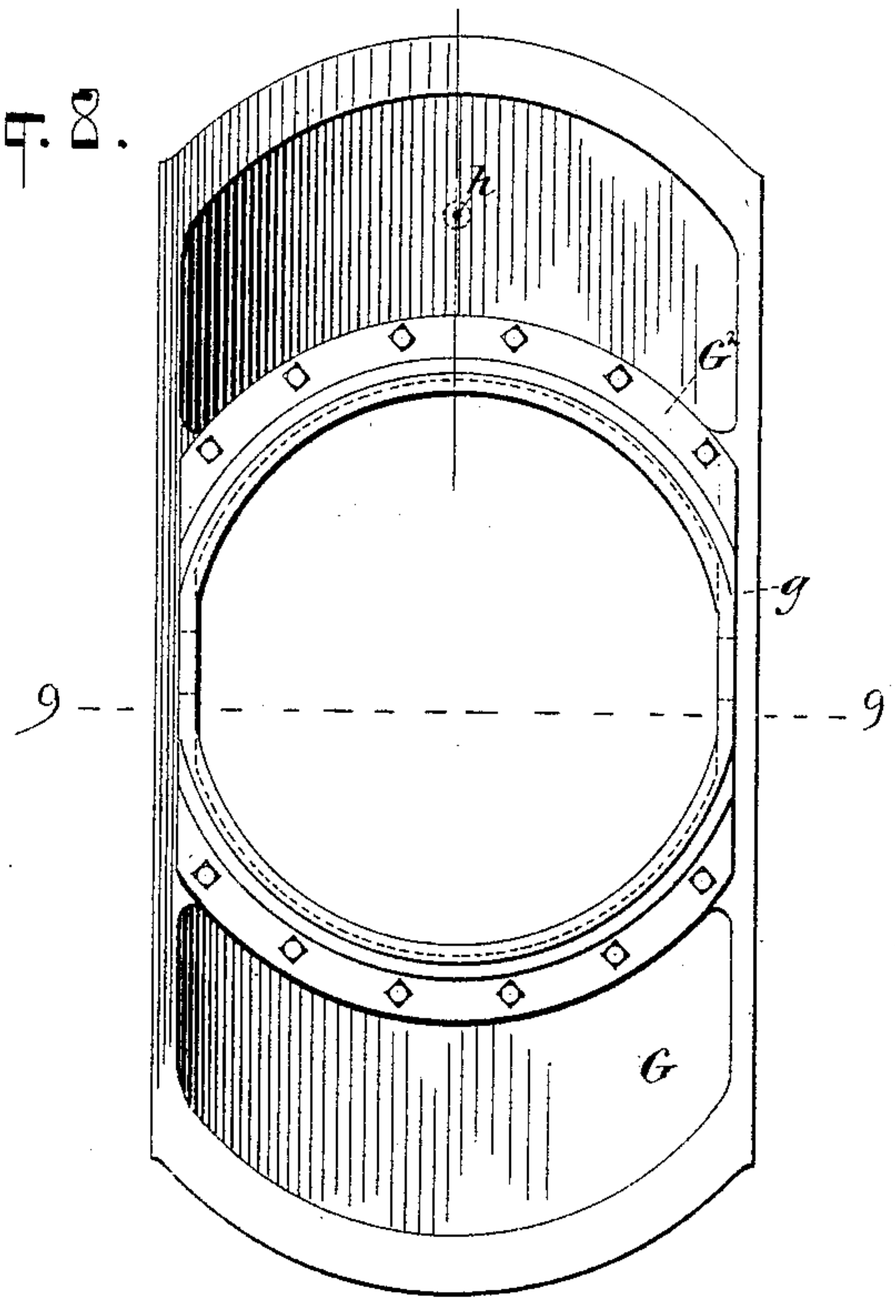


Fig. 11.

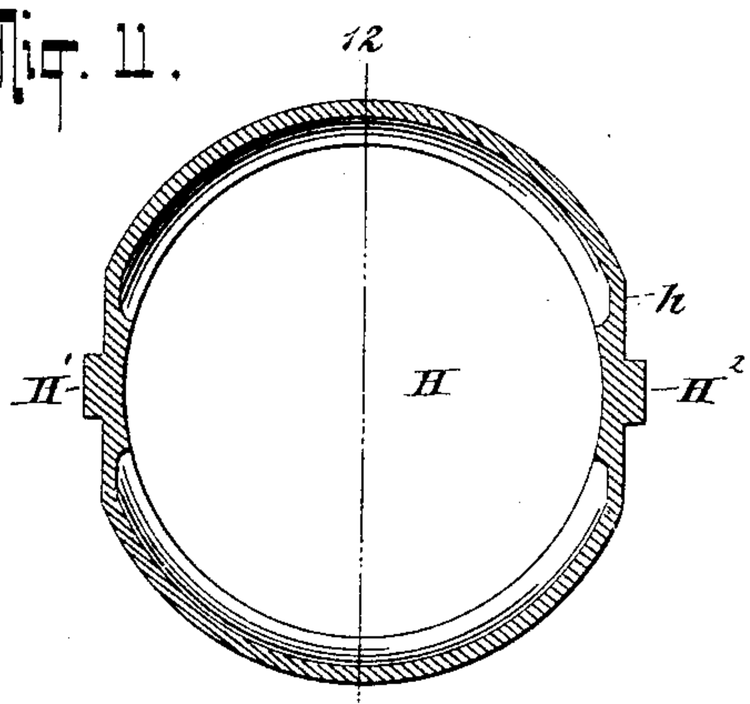
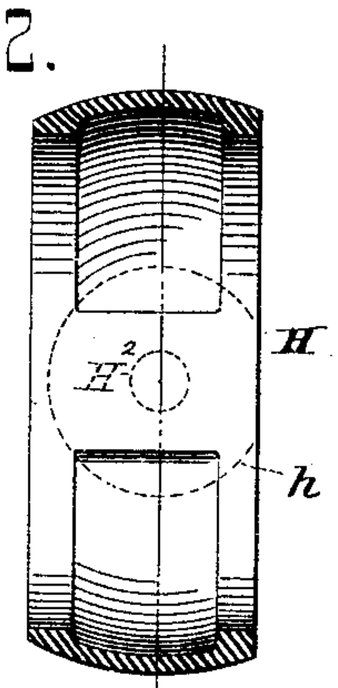


Fig. 12.



WITNESSES:

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UNITED STATES PATENT OFFICE.

WILLIAM DURELL STIVERS, OF JERSEY CITY, NEW JERSEY.

TURRET FOR WAR VESSELS.

SPECIFICATION forming part of Letters Patent No. 604,435, dated May 24, 1898.

Application filed June 4, 1896. Serial No. 594,246. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM DURELL STIVERS, a citizen of the United States, residing in Jersey City, Hudson county, in the State of New Jersey, have invented a certain new and useful Improvement in Gun-Port Shutters, of which the following is a specification.

The invention applies more especially to that class of war vessels in which guns are operated in revolving turrets, and I will describe the invention as thus applied. It is common to make the aperture in the turret only a little wider than the diameter of the gun and to give sufficient vertical dimensions to allow for a liberal elevation and a slight depression. The invention is more important in vessels of the monitor class, in which the base of the turret is elevated but a few feet above the mean water-line. On the open ocean even in good weather the seas wash across the deck and would enter the turret through the spaces left unstopped by the gun, and as these gun-ports are obliged to be stoppered with close-fitting blocks or other means the guns are rendered inoperative when the ports are so closed. My invention by excluding the water without interfering with the movement of the guns allows the efficient use of the guns under any condition of wind or wave. The parts will also protect the men in the interior of the turret against being injured by small projectiles which would otherwise enter the aperture in the turret around the gun.

I provide a slide mounted on a casing which projects sufficiently outward from the turret. The gun plays through a universal joint in such slide, and the slide rises and falls in the ways of the casing as the gun is elevated and depressed. I will term such slide a "shutter." Its function is to shut the aperture around the gun. The universal joint is formed by a spherical ring with trunnions supported in a spherical zone in the shutter.

The invention also includes a ship or floating support having such turret provided with a shielded gun and a yielding diaphragm closing the joint between said support and turret.

Parts of the invention will apply to guns which are mounted in connection with revolving shields less than a complete turret.

The accompanying drawings form a part of this specification and represent what I consider the best means of carrying out the invention.

Figure 1 is a vertical section of the turret on the line 1 1 in Fig. 2. This view gives also an outline of one of the guns elevated. Fig. 2 is a plan view of the turret. The remaining figures represent portions on a larger scale. Fig. 3 is a front view, Fig. 4 a side view, and Fig. 5 a horizontal section, of the casing. Fig. 6 is a vertical section in the plane of the axis of one of the guns. The full lines show the gun point-blank. The dotted lines show it elevated. Fig. 7 is a corresponding plan view. The remaining figures are on a still larger scale. Fig. 8 is a front view of the vertical slide or shutter. Fig. 9 is a plan view, partly in horizontal section, on the line 9 9 in Fig. 8; and Fig. 10, a part central vertical section of the same. Fig. 11 is a vertical section of the spherical ring which is mounted within the shutter, and Fig. 12 is a corresponding section on the line 12 12 in Fig. 11. Fig. 13 is a plan view showing the application of my invention to a single gun mounted in a revolving shield. All the parts may be substantially the same as with turrets where two guns are employed except that the casing must be shaped to adapt it to its radial position relatively to the center of motion of the revolving shield.

The figures represent the novel parts with as much of the ordinary parts as is necessary to indicate their relation thereto.

Similar letters of reference indicate corresponding parts in all the figures where they appear.

A is the deck of the vessel; B, the turret, mounted on a stout support A^2 in the ship and revolving on conical rollers C, traveling in a circular path as the turret is revolved. The machinery to effect the revolving of the turret, the carriage for supporting the gun and allowing the recoil, and the provisions for elevating and depressing the gun may be all of the ordinary and long-approved character and need not be specially represented.

The gun is allowed to move axially on a support M, which turns on a center *m* in the interior of the turret nearly adjacent to and below the port-aperture, through which the gun plays. This arrangement allows a large

variation in the elevation of the gun, with but little rising and sinking at the point where it extends through the side of the turret, and thus requiring only a moderate vertical depth of the aperture.

D is a diaphragm extending out horizontally from the turret and revolving therewith in one direction and the other in a plane a little above the deck. This diaphragm or a shoe carried thereon is received in a deep circular recess in the interior of a series of segments A^4 A^5, bolted on the ordinary coaming A′, which is supported on the deck. This is ordinarily concentric to the turret; but the diaphragm allows the turret and the ship to move to a considerable extent relatively to each other, due to any irregularities in the structure, and accommodate the springing of the vessel and of the turret-support under strains in a seaway and especially to yield to the immense strain temporarily imposed when the guns are fired with heavy projectiles.

There are two guns F F, which may be of any ordinary or suitable pattern and carried in the usual manner. My invention as applied to one being the counterpart of the same applied to the other, a description of one will suffice for both.

B′ is a sufficiently stout casing, of brass or other suitable material, bolted on the exterior of the turret and extending outward therefrom.

B^2 B^2 are vertical ways, (see Fig. 5,) in which is mounted a slide or shutter G, which performs important functions. I will designate certain portions of this shutter, when necessary, by supernumerals.

G′ is a nearly complete zone of a hollow sphere, forming a portion of the shutter and cast integral therewith. G^2 is a corresponding portion the counterpart of G′ and bolted in place. The inner surfaces of these portions, which together constitute a nearly complete zone, coincide. Two exceptions to the spheroidal form of the interior are flat surfaces *g* at the mid-height, one on each side. In the center of each of these flat surfaces is a cylindrical hole adapted to support a trunnion.

H is a ring of just sufficient diameter, the exterior of which is mainly spherical, and is smoothly finished to fit water-tight and move easily in the corresponding smoothly-finished interior of the zone G′ G^2. The main portion of the exterior is perfectly spherical; but a considerable area at each side is flattened, as indicated by *h*. There are stout short trunnions H′ H^2, each in the center of one of the flat areas *h* on each side.

I is a sleeve fitted upon the gun and having a smooth cylindrical exterior fitting the correspondingly cylindrical interior of the ring H.

As the gun is elevated or depressed the shutter G rises and falls in the ways B^2, and the varying angles at which the gun stands are accommodated by the rolling of the spherical ring H within the concave zone G′ G^2. The gun, with the sleeve I attached, moves freely outward and inward through the spherical ring.

The light trunnions H′ H^2 on the nearly spherical ring are fitted in the holes in the respective centers of the areas *g* in the shutter and are favorably conditioned to support the weight of the shutter and to compel the latter to move up and down as the gun is elevated and depressed.

The turning of the spherical ring H will be obvious. So, also, will the outward and inward movement of the sleeve I through it, as the angle changes in elevating and depressing the gun.

I use the term "deck" to imply not only the part commonly so called on a vessel, but also the corresponding foundation or floor of a barbette, fort, or other place where my invention may apply.

As illustrated in Fig. 10, the slide or shutter G at a point a short distance above the zone may be provided with a suitable sight-opening *h′*.

Modifications may be made without departing from the principle or sacrificing the advantages of the invention.

I have shown the spherical ring H as hollowed to reduce the weight; but this may not be essential. It may be preferred in some cases to make it solid. It may be exteriorly varied in form so long as it is circular in the vertical plane to be freely rolling on the horizontal axis and maintain a tight contact with the contiguous portions of the shutter. I have shown the casing B as made of only moderate thickness and strengthened by a web extending longitudinally on its upper and lower portions, (see Fig. 4;) but these webs may be omitted and an increased thickness given to the other portions. The zone G′ G^2 may be secured together by other means than bolts. Parts of the invention may be used without the whole. The cylindrical sleeve I may be omitted, and the spherical ring H may be applied directly to the exterior of the gun. Such construction may be worked very successfully where that portion of the gun is cylindrical. It may be expedient where the gun is finished with reference to this invention to make a sufficient portion of the length exactly cylindrical.

Instead of making the main surface of the ring H spherical it may be made transversely cylindrical or slightly conical, the interior of the parts G′ G^2 being correspondingly formed, so that the parts will fit and turn relatively to each other like the plug in a horizontal stop-cock; but I prefer the spherical form shown for obvious reasons.

The aperture *h′* for sighting may be dispensed with, and the means now commonly used for sighting, such as connected parts in the conning-tower, may be relied upon instead. All these means may be provided for alternate use as exigencies shall require.

The opening h' is more especially adapted for guns and revolving shelters of moderate size. With either or all means of sighting the interior of the turret or shield is practically defended against wind and water and against small projectiles.

The invention is not confined to turrets. It is applicable for closing the ports in shields carried on gun-carriages and the shields carried on revolving platforms on ships and on land fortifications.

I claim as my invention—

1. A revoluble turret having two obliquely-located ports or gun-apertures, guns correspondingly arranged one on each side of the radial line, each elevated and depressed by turning on an axis m arranged squarely relatively to the gun near the corresponding oblique aperture, and an angularly-projecting casing B′ rigidly connected to the turret and surrounding each aperture, and extending outward parallel each to the other, provided with parallel ways one on each side, equidistant from the axis m, in combination with a shutter engaged with each gun and with the ways so as to traverse up and down in the latter as the gun is elevated and depressed, all arranged for joint operation substantially as herein specified.

2. A turret or shield arranged to turn horizontally, and carrying a gun turning therewith, a shutter connected to the gun and moving with it up and down as it is elevated and depressed, and having a spherical aperture, in combination with a spherical ring arranged to turn in such aperture and also to allow the gun to move longitudinally through it, substantially as herein specified.

3. A turret or shield arranged to turn horizontally and carrying a gun turning therewith, a shutter connected to the gun and moving with it up and down as the gun is elevated and depressed, and having a spherical aperture, and flat portions g, g, each with a hole therein, in combination with an inclosed spherical ring H having trunnions H′, H², engaged in such holes so as to aid in supporting the shutter on the gun and allow the free turning of the ring H thereon, all substantially as herein specified.

4. The combination with a revolving turret or shield B, of a gun F turning therewith and having a cylindrical exterior along its midlength, a ring H having a generally spherical exterior form inclosing such cylindrical portion of the gun and an inclosing part G′, G², matching to the spherical exterior of said ring, the gun extending outward and adapted to move longitudinally within the ring and to accommodate the elevation and depression by the rolling of the ring, all substantially as herein specified.

5. A ship or floating support, a revoluble turret, projecting above the upper deck thereof and capable of being revolved horizontally, a gun inclosed therein and turning therewith, elevated and depressed on an axis within the turret contiguous to the gun-port, an externally-projecting casing rigidly connected to the turret and having guideways in which a shutter plays up and down to accommodate the elevation and depression of the gun, a device H rocking in such shutter adapted to permit a cylindrical portion of the gun to work longitudinally through such device, all combined and arranged for joint operation substantially as herein specified.

6. A turret or shield arranged to turn horizontally and carrying a gun turning therewith, a shutter connected to the gun and moving with it up and down as the gun is elevated and depressed, and having a spherical aperture, in combination with an inclosed spherical ring and with a sleeve I, carried on the gun, all arranged for joint operation substantially as herein specified.

7. A ship or floating support, a revoluble turret carried thereon inclosing a gun elevated and depressed in a suitable gun-port in said turret, a yielding diaphragm closing the joint between the turret and ship, allowing liberty for both a revolving and lateral movement, and a shutter closing the joint between the gun and turret, all substantially as herein specified.

In testimony that I claim the invention above set forth I affix my signature in presence of two witnesses.

WILLIAM DURELL STIVERS.

Witnesses:

J. B. CLAUTICE,

M. F. BOYLE.