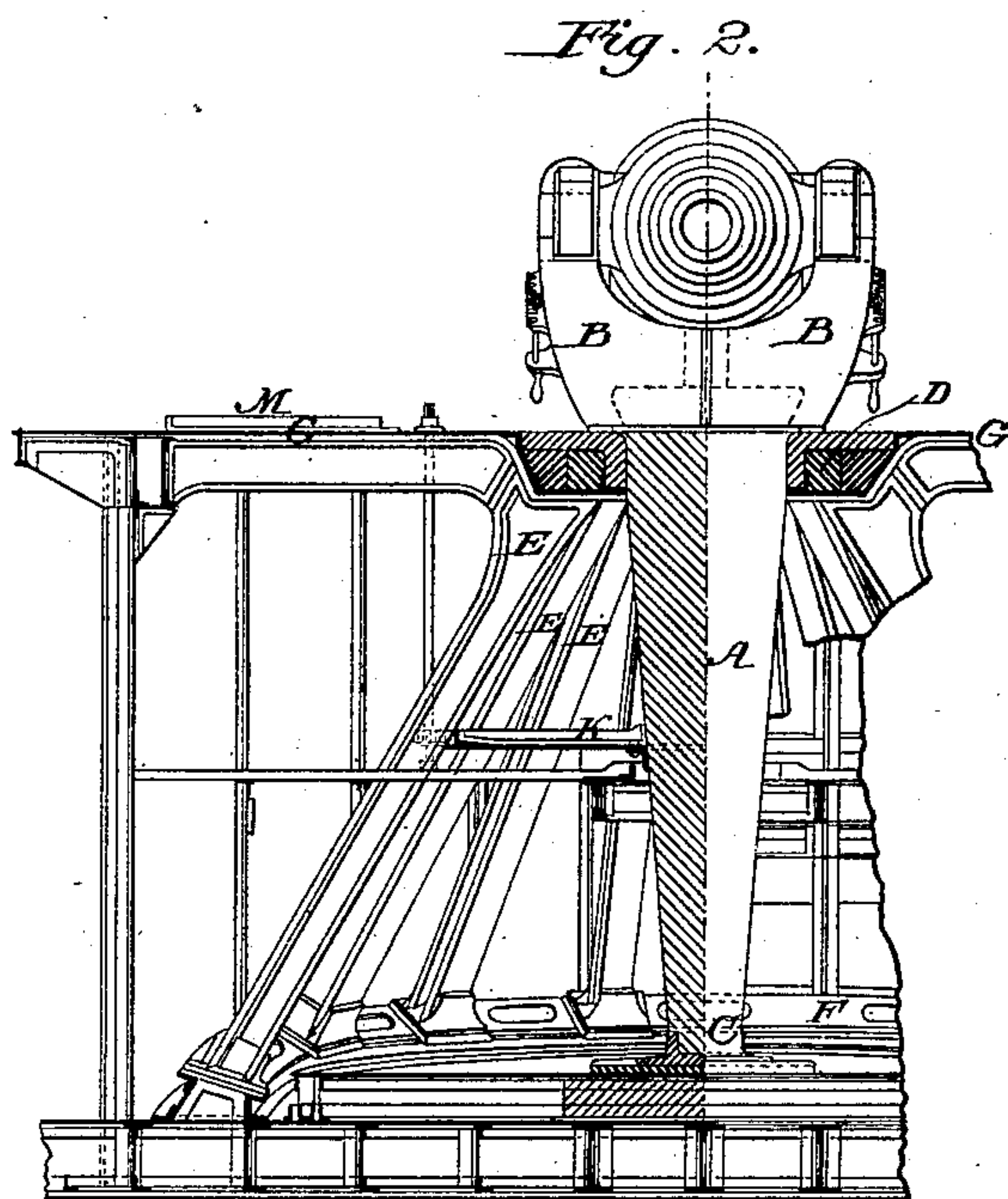
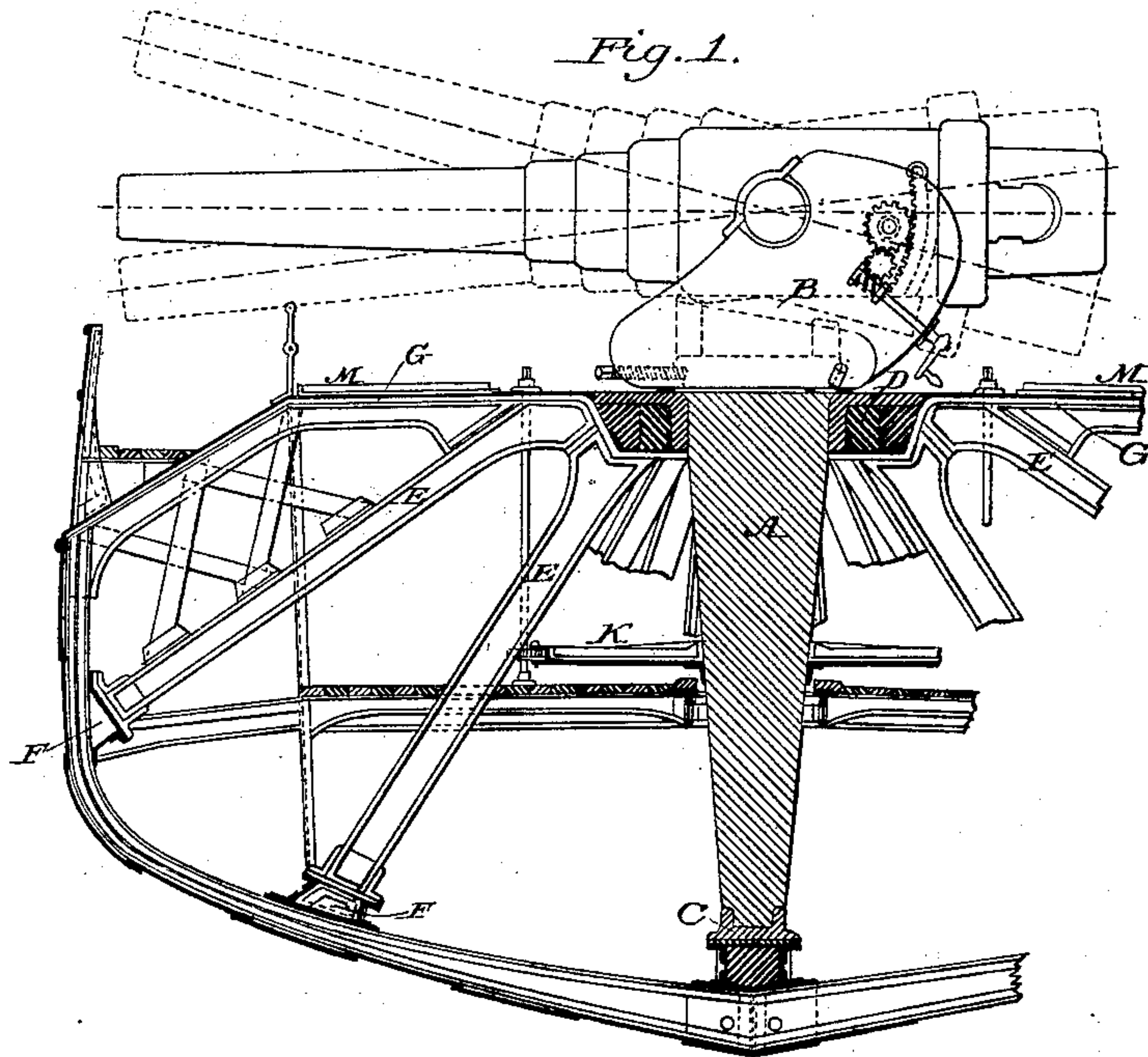


A. KRUPP.

MOUNTING ORDNANCE ON SHIPS.

No. 245,386.

Patented Aug. 9, 1881.



Witnesses:

Harold Terrell  
Chas. H. Smith

Inventor:

per Alfred Krupp  
Lemuel W. Terrell  
att'y

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Fig. 4.

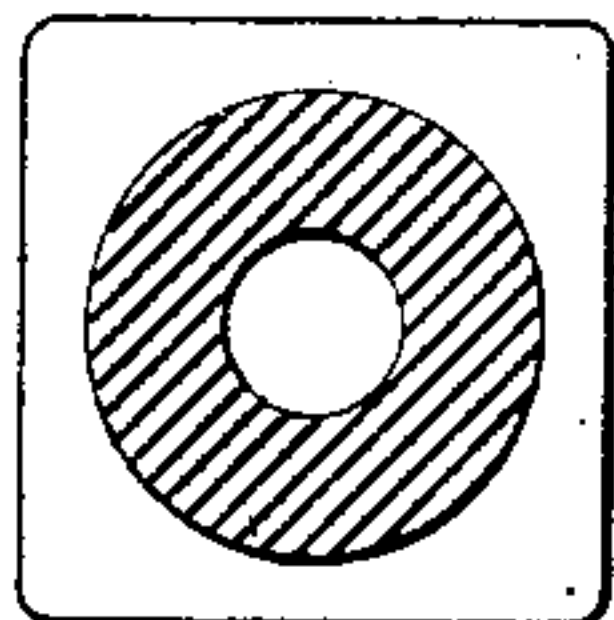


Fig. 5.

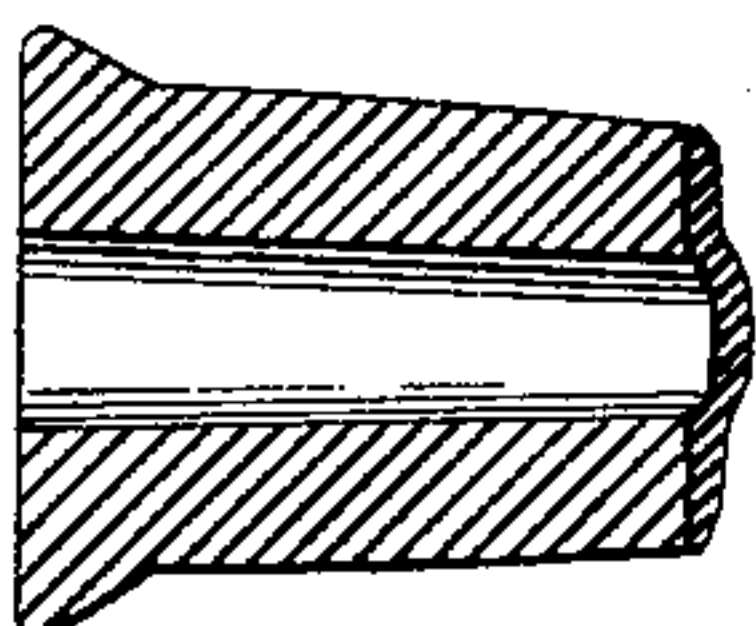


Fig. 3.

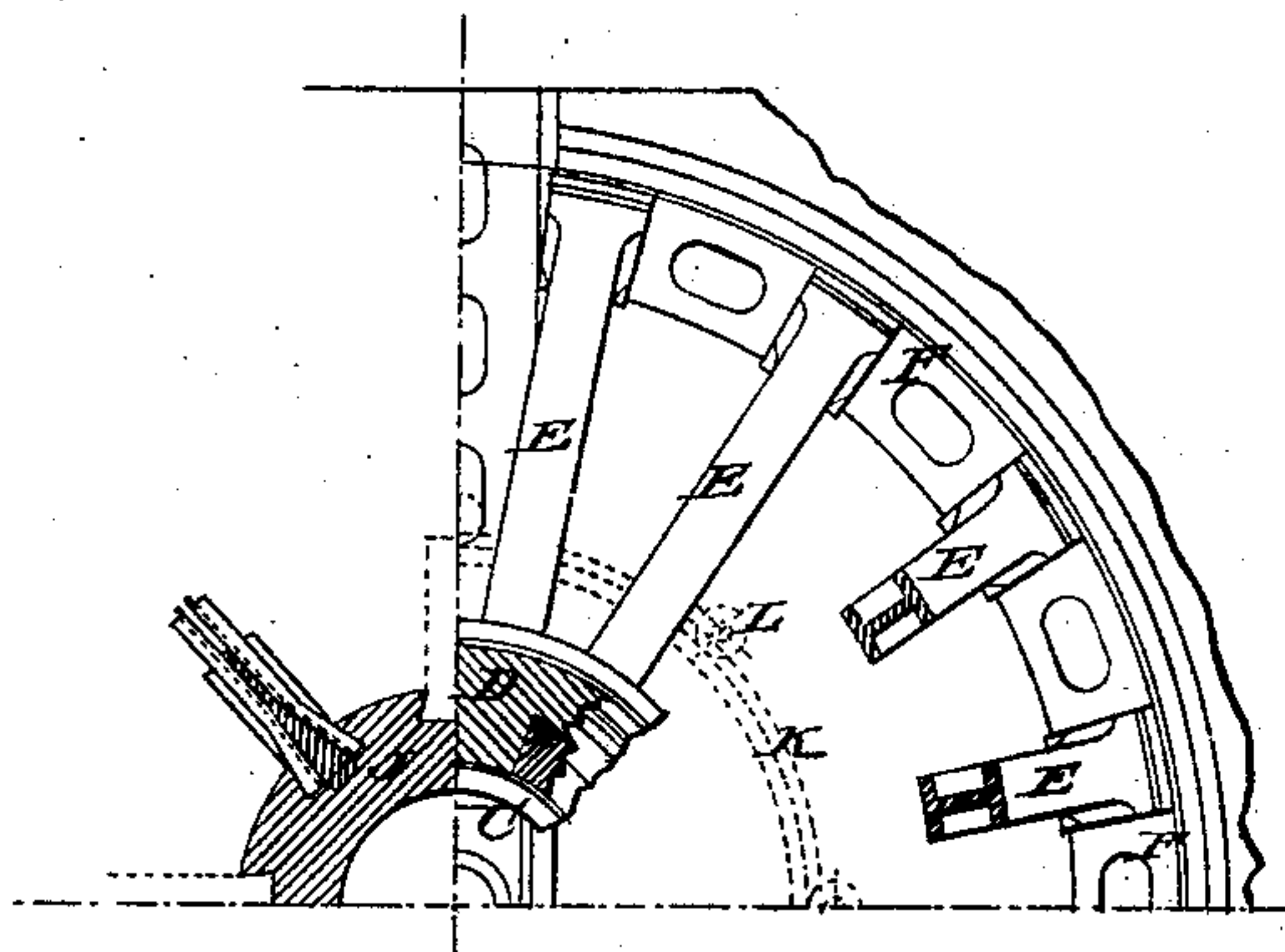
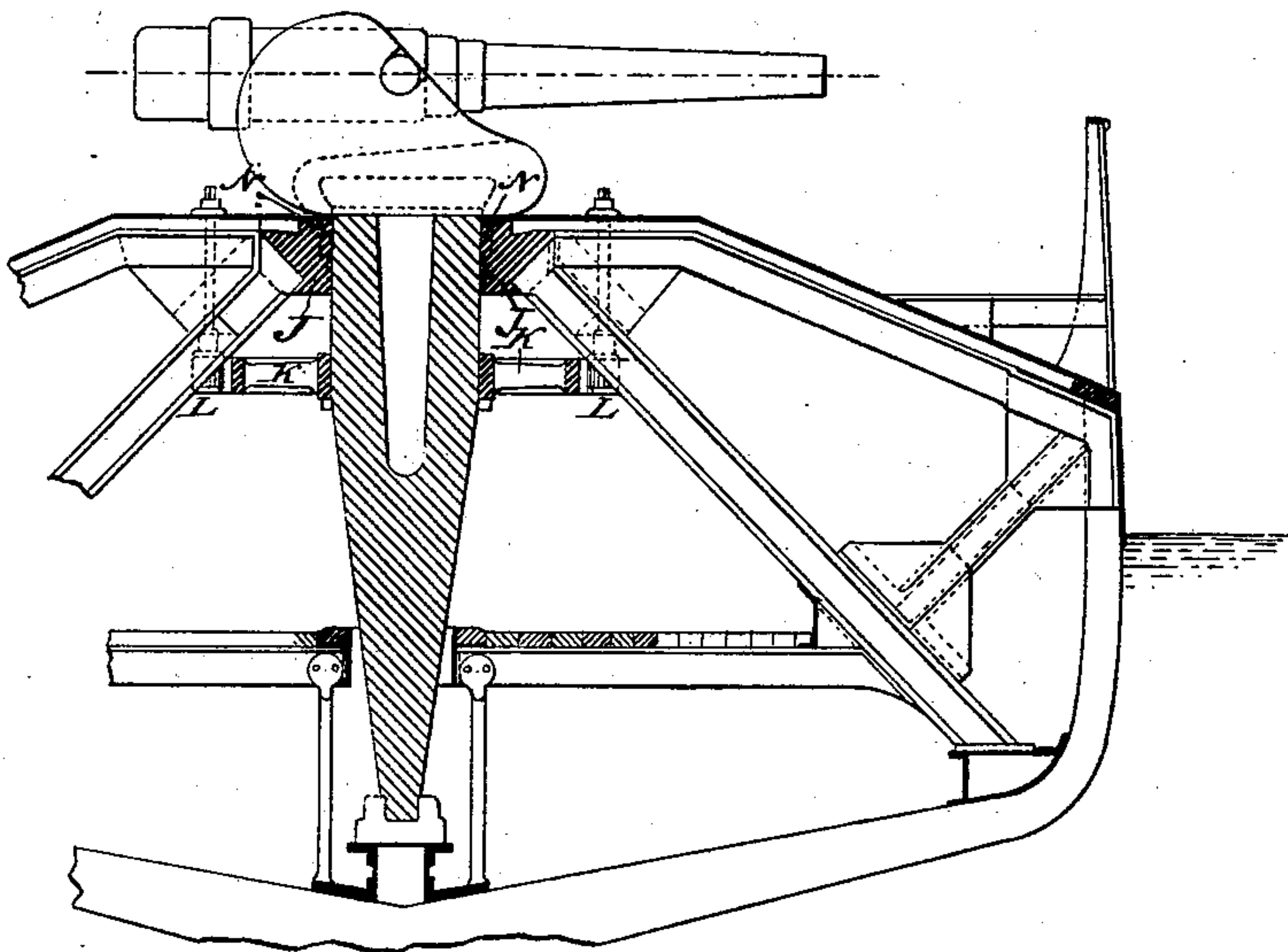


Fig. 6.



Witnesses:

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Charles Smith

Inventor:

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Lemuel W. Lurell  
Atty



# UNITED STATES PATENT OFFICE.

ALFRED KRUPP, OF ESSEN, GERMANY.

## MOUNTING ORDNANCE ON SHIPS.

SPECIFICATION forming part of Letters Patent No. 245,386, dated August 9, 1881.

Application filed November 30, 1878. Patented in England April 11, 1878.

*To all whom it may concern:*

Be it known that I, ALFRED KRUPP, of Essen, in the Empire of Germany, cast-steel manufacturer, have invented new and useful  
5 Improvements in Mounting Ordnance, which improvements are fully set forth in the following specification, reference being had to the accompanying drawings.

These improvements relate to the mounting,  
10 pivoting, and easier working of guns in ships and vessels of war, land forts, batteries, and other constructions carrying-arms, ordnance, or offensive and defensive naval and military  
15 appliances; and they have, principally, for their object the firing in any direction, and the construction of the supports, platform, and vessel in such manner that the gun is held securely in its place, yet may rotate with the shaft or  
20 spindle, so as to obtain all-round fire, resist or absorb the recoil, thus combining in light-draft swift vessels the qualities of the broadside, end-on, and turret ships.

My invention consists in constructing, arranging, and combining the apparatus, spindle,  
25 or shaft, and carriage in one, so as to resist or absorb the recoil, substantially in the manner hereinafter described for the above purpose. The guns or ordnance and carriage are arranged and connected in such way that the  
30 gun may rotate, so as to command and fire at all points of the compass.

I proceed to describe, with reference to the accompanying drawings, modes of carrying the invention into practical effect.

35 The modes are illustrated by the accompanying drawings.

Figure 1 represents a partial transverse section of a light-draft gun-vessel on my plan with sloping sides. This vessel may carry one  
40 or more heavy guns so pivoted as to command all-round fire, and thus avoid the necessity of laying the vessel's head in any particular direction. Fig. 2 shows an end view of the gun and partial section of the vessel and gun-sup-  
45 ports. Fig. 3 shows partial sectional plans of the gun bearings and supports, the right side corresponding to the support shown in Fig. 2, and the left side to that shown in Fig. 6. Fig. 4 is a sectional plan, and Fig. 5 a vertical sec-  
50 tion, of the hollow spindle or shaft shown in Fig. 6. Fig. 6 is a vertical section, transversely

of the vessel, of the gun-spindle, and an elevation of the gun and gun-supports.

A is the spindle or shaft, forged either solid, as shown in Figs. 1 and 2, or hollow, as shown in Figs. 4, 5, and 6, the head of which is either made square or round to enable the carriage or cheeks B to be shifted to any position in the event of the head being damaged. These cheeks forming the carriage I make either of  
60 forged iron, soft cast-steel, bronze, or other material found most desirable, placing the trunnions in such a position that the rear part of the spindle may always be close to its bearings, and which I connect by means of dove-  
65 tails, keys, screws, and wedges.

The step or shoe C may be either of forged iron or of soft cast-steel or other material, well supported and secured to the keelson of the vessel, or, where depth of vessel allows, it may  
70 be secured and carried upon an intermediate deck, the keelson, floors, and deck of which I stiffen for the purpose.

At the deck or under the head of the shaft or spindle A, I support the same either by  
75 means of an arm or plate bush, backed with teak or hard-wood cheeks, well secured to plate and angle-iron carlings, as usual in ship-building, and shown at D. These carlings I carry by means of wrought H-iron struts E,  
80 stepped upon keelsons F, and ice-bars G, of flat iron worked under the deck-plating, Figs. 1, 2, and 3, the whole of which I well connect to the frames, floors, and beams of the ship, or by means of a solid brush or block, J, of  
85 wrought-iron, soft cast-steel, or other material, with friction-rollers, or having a tight-fitting turned ring, N, let into it in two pieces, as shown at Fig. 6, and supported by H-iron  
90 struts, flat tie-bars, rods, and trussing well dovetailed and keyed into it, and connecting them to the vessel's framing in a similar manner as above.

K in Figs. 1, 2, and 3 shows a strong wrought or cast iron wheel, secured to the  
95 shaft or spindle A by keys or screws, bolts, or other means, and turned by the pinions L, driven either by steam, hydraulic, or hand power, their spindles or shafts being continued through the upper deck to enable the gunner,  
100 by means of keys or levers, to adjust the position as required for smaller guns. This wheel



may be secured somewhat higher up the shaft, as shown in Fig. 6, or placed in any more convenient position, but in all cases arranged so as to give rapid motion.

5 In my vessel, deck, or platforms, within the rear circle of the gun I purpose making strong hatches or cap-scuttles of wrought-iron, as shown at M, Fig. 1, to prevent undue exposure of the men, and to facilitate the loading and  
10 sighting of the gun while in any position.

I am aware that guns have been mounted on pivots, and that gun-carriages have intervened between the gun and the pivot, so that the carriage was moved by the recoil; and I am  
15 also aware that diagonal braces have been introduced in the framing of a vessel.

By my improvement the recoil of the gun is taken upon the entire vessel, and the vessel itself becomes a carriage for the gun.

20 I do not claim a ship's gun-carriage in which the trunnions are mounted on a vertical shaft capable of being revolved, and so that the shock caused by the firing of the gun is taken upon parts that are connected to the ship.

I claim as my invention—

1. In combination with the gun and vertical pivot, the trunnion-bearings B, connecting the gun directly to the pivot-shaft, the neck-bearing G, and the radial and downwardly-inclined  
25 braces connected at their upper ends around 30 the neck-bearing, and at their lower ends to the bottom of the vessel, for distributing the strain of the recoil, substantially as set forth.

2. In combination with the pivoted gun-carriage and gun, and the floating vessel carry-  
35 ing the same, a neck-bearing inserted into the deck of the vessel, and braces extending from the neck-bearing to the vessel, to distribute the recoil of the gun upon the vessel, whereby the recoil of the gun is transferred to the en-  
40 tire vessel.

ALFRED KRUPP.

Witnesses:

OTTO EICHHOFF,  
JOHANNES PIEPER.