

F. F. FLETCHER.
GUN MOUNTING.

No. 499,530.

Patented June 13, 1893.

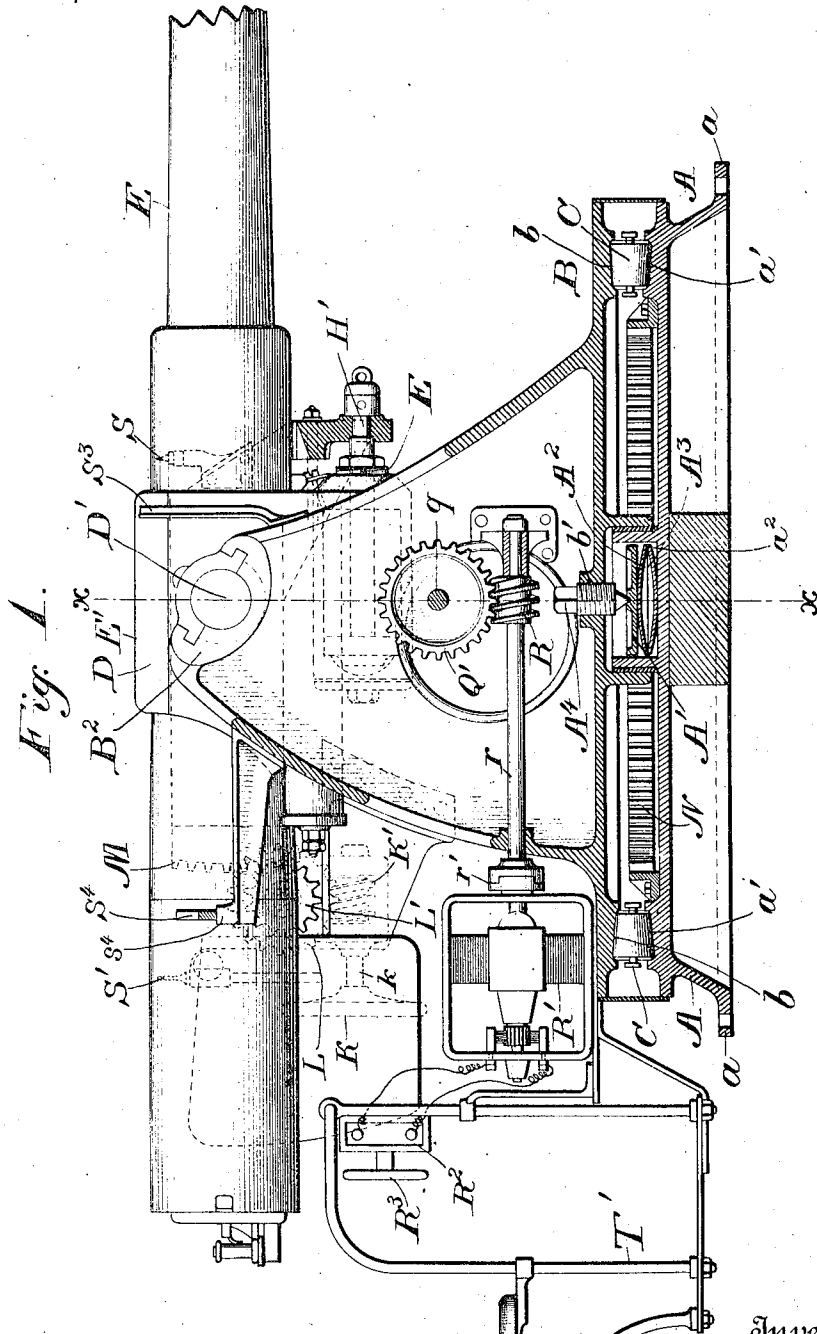


Fig. 1.

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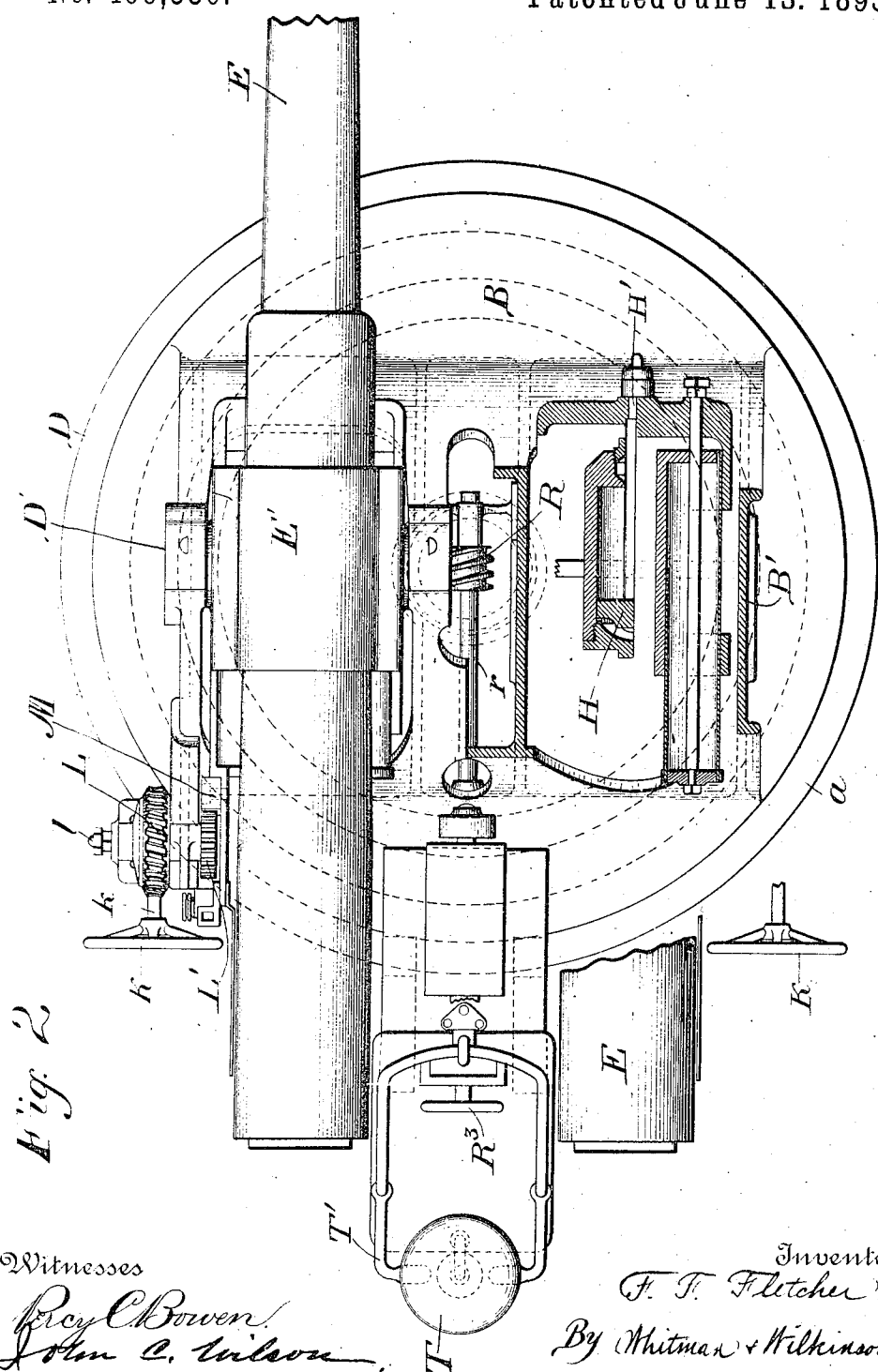


Fig. 2.

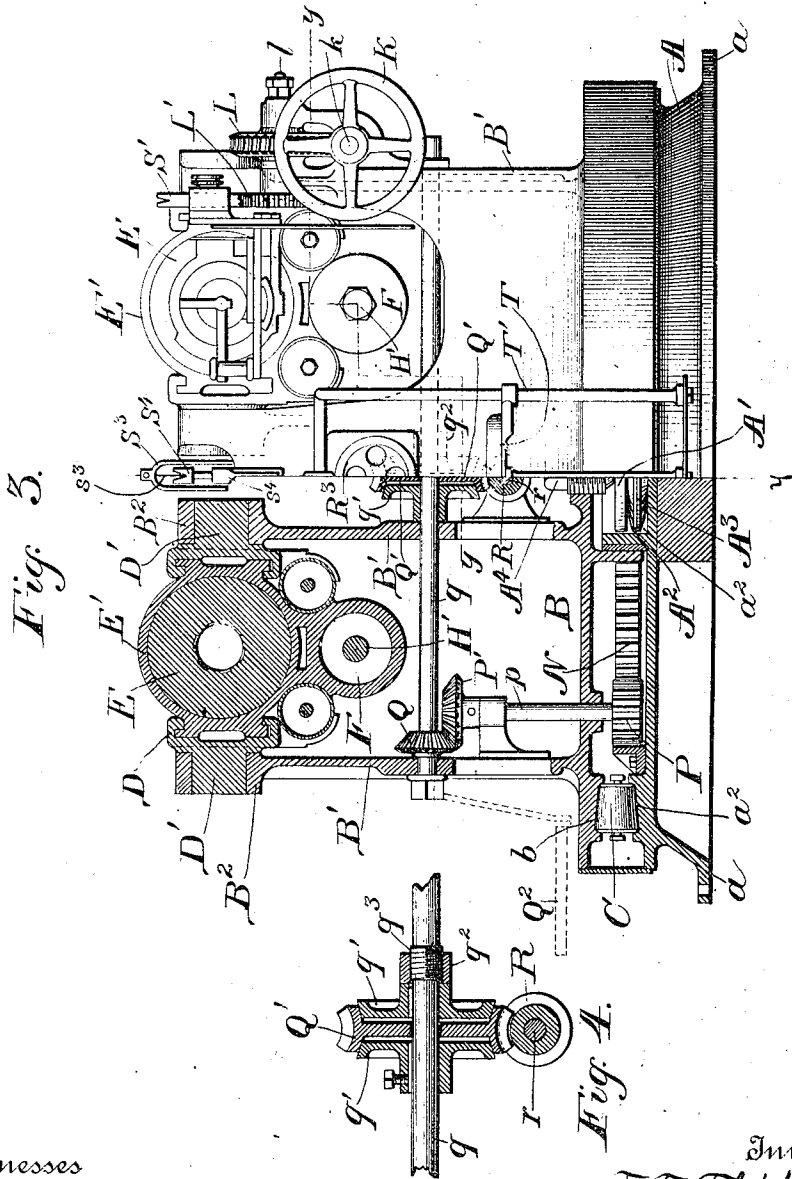
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UNITED STATES PATENT OFFICE.

FRANK F. FLETCHER, OF THE UNITED STATES NAVY.

GUN-MOUNTING.

SPECIFICATION forming part of Letters Patent No. 499,530, dated June 13, 1893.

Application filed November 17, 1892. Serial No. 452,271. (No model.)

To all whom it may concern:

Be it known that I, FRANK F. FLETCHER, a lieutenant in the United States Navy, and a citizen of the United States, stationed at Washington, in the District of Columbia, have invented certain new and useful Improvements in Gun-Mountings and Methods of Framing the Same; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in gun carriages which are mounted upon a revolving base, and to improvements in the means of training the gun carriage and guns to the right or left and for adjusting the said train by sights fixed to the gun carriage.

Reference is had to the accompanying drawings, in which the same parts are indicated by the same letters throughout the several views.

Figure 1 represents a vertical, longitudinal section through the pivot of the improved gun mount, and represents the carriage in section and one of the two guns in elevation. Fig. 2 represents a plan view of one of the guns, and a section of the mount for the other gun along the broken line yy of Fig. 3. Fig. 3, represents a rear elevation of one of the guns and of half of the mount, and a vertical section through the trunnions of the other gun and the mount. Fig. 4 represents a vertical section through the worm wheel and worm for training the guns.

A represents the platform or support for the gun mount secured to the deck of the ship or the gun platform by the flange a , and provided on its upper side with an annular groove a' , and a hollow cylindrical portion a^2 for the cone rollers C, and the cup springs A^2 and A^3 and plate A' . Mounted on these rollers C is the gun carriage B, also provided with an annular groove b to serve as a guide for the said cone rollers C. The center of this carriage is provided with a female screw b' , into which the screw A^4 is fitted. This screw A^4 bears down on the plate A' which rests on the cup springs A^2 and A^3 and by adjusting the ten-

sion on these springs by means of the screw A^4 , the weight of the carriage and guns is to a certain extent taken off of the cone rollers C, and put upon the central pivot A^4 thereby diminishing the friction on the roller bearings. It is evident that a rubber disk may be used in lieu of the springs A^2 and A^3 .

The gun carriage B is provided with brackets B' on each side of each gun, which brackets are fitted at B^2 to inclose the trunnions D' , of the rocking slide D in which the gun recoils in the line of fire.

The construction of the rocking slide and its connections is well known in the art and is shown in my Patent No. 457,641, dated August 11, 1891.

The gun E is provided with a trunnion band E' and hydraulic cylinder F, having the piston H attached to the piston rod H' which is rigidly connected to the rocking slide.

The elevation of each gun is adjusted by means of a hand wheel K mounted on a shaft k which also carries the worm K' meshing in the worm wheel L mounted on the same shaft l with a pinion L'. The said pinion engages in a rack M fixed on the rear portion of the rocking slide D.

The two guns are trained by means of the circular rack N rigidly attached to the upper side of the platform A; in this rack N the pinion P engages, the said pinion being on the same shaft p with the miter gear P' driven by the miter gear Q on the shaft q , set transversely in the carriage B. On this shaft q , the worm wheel Q' is revolubly mounted, but it is normally held between friction disks q' , one of which is rigidly attached to the shaft and the other has a longitudinal motion but is held against turning on the shaft, the worm wheel Q' being compressed between the said friction disks by means of the nut q^2 and screw q^3 . The worm R mounted on the shaft r , meshes in the worm wheel Q', and is driven by the electric motor R', whose armature shaft is connected to the shaft r by the coupling r' , as shown in Fig. 1. The revolution of the shaft r turns the worm R, worm wheel R', shaft q , miter gears Q and P', vertical shaft p and pinion P meshing in the rack N, thus

training the gun to the right or left, according to the direction in which the shaft r is revolved.

R^2 represents a switch box of any desired or well known construction, and R^3 represents a hand wheel for putting the switch into operation, the hand wheel and switch being preferably so arranged that the direction in which they are turned is that in which the muzzle of the gun is moved by the electric motor R' .

Since both guns are mounted at opposite sides of the central pivot, when one gun is fired there will be a tendency of the entire carriage to swing around in the direction of the recoil; this might cause injury to the teeth of the worm wheel Q' or the worm R or other parts of the mechanism for revolving the gun carriage, were there not some provision made for the said worm wheel to slip about its axis. By means of the arrangement hereinbefore described, and shown in Fig. 4, as either gun recoils, the worm wheel Q' slips between the friction disks q' and so acts as a brake upon the continued motion of the carriage. This braking effect is also useful if the carriage or either of the guns be struck by a projectile.

It will be evident that by shifting the friction disks or throwing the worm wheel Q' out of action a hand-crank Q^2 shown in dotted lines in Fig. 3 may be used to turn the miter gears Q and P' and the pinion P , and thus to train the carriage in lieu of the electric motor hereinbefore described.

Each of the guns is provided with the ordinary sights S and S' by which the said gun may be pointed in the usual way, if desired; in addition to these sights, a front sight S^3 and a rear sight S^4 mounted in a sight box s^4 are attached to the carriage for keeping the guns trained in the right direction. These sights are in a vertical plane parallel to the vertical planes passing through the axis of the bore of each of the guns. The front sight S^3 is preferably provided with a vertical wire s^3 , and the rear sight S^4 is preferably provided with the ordinary notch as shown in Fig. 2. When the two guns are trained on the target, the vertical wire, the base of the notch, and the target should be in the same vertical plane.

Elevation is preferably given independently to each gun by means of its own hand wheel K , the gun being sighted for elevation by means of the sights S and S' , but both guns are preferably given the desired lateral training by means of the sights S^3 and S^4 , entirely independently of the sights S and S' .

The operation of sighting the guns is as follows:—A member of the gun's crew remains seated on the seat T mounted on the frame T' which is carried by and moves laterally with the gun carriage. By means of the hand wheel R^3 he trains the gun to the right or left, and by keeping the sights S^3 and S^4 in line with the target, the axis of each

gun is at all times trained in the proper vertical plane; just before firing, another member of the gun's crew, by means of the hand wheel K , adjusts the elevation of the gun until the sights S and S' bear on the target, when the gun is fired. By this means the functions of elevating and training the gun are separated, and the operation of sighting the gun is greatly facilitated and greater accuracy obtained. It will be obvious that this method of sighting guns may be adopted where guns are mounted singly, as is ordinarily the practice; the gun then being provided with one set of sights mounted on the gun itself, or on the rocking slide, for adjusting the elevation, and another set of sights mounted on the gun carriage independent of the gun for adjusting the lateral train.

It will be seen that the herein described method of mounting guns insures great compactness in the battery, and since many of the operative parts are common to both of the guns, decreases weight and expense. Where gun shields are necessary a very small increase in the size of the shields will cover both guns.

It will be obvious that many modifications would readily suggest themselves to any one skilled in the art which might be used without departing from the spirit of my invention.

I claim as new—

1. In a gun-mounting, the combination with a pivoted gun-carriage, of the training-gear consisting of a circular rack having vertical teeth on the interior face thereof, said rack being rigidly attached to the pivot-stand or firing-platform, of a cog-wheel meshing with the said rack, a vertical shaft journaled in the gun-carriage and carrying the said cog-wheel at one end and a miter gear at the other, a second miter gear on a shaft journaled across the carriage engaging the first miter gear, a worm wheel firmly but not rigidly held on the said transverse shaft, a worm engaging the said worm-wheel, and an electric motor in operative connection therewith, substantially as and for the purposes described.

2. In a gun-mounting, the combination with a pivoted gun carriage of the training gear consisting of the circular rack N secured to the pivot stand, the pinion P meshing in said rack, the shafts p and q and miter gears P' and Q , the worm wheel Q' firmly but not rigidly mounted on the shaft q , the worm R and shaft r , the electric motor R' , the switch box R^2 , and the hand-wheel R^3 for operating the switch, substantially as and for the purposes described.

3. In a gun-mounting the combination with a pivoted gun carriage of the training gear consisting of the circular rack N secured to the pivot-stand, the pinion P meshing in said rack, the shafts p and q and miter gears P' and Q , the worm wheel Q' revolvably mounted on the shaft q , the friction disks q'

held against turning on said shaft *q* and
means for clamping said worm-wheel be-
tween said friction disks; the worm *R* mount-
ed on the shaft *r* and engaging in said worm
5 wheel; and the electric motor *R'* having its
armature shaft connected to said shaft *r*, sub-
stantially as and for the purposes described.

In testimony whereof I affix my signature in
presence of two witnesses.

FRANK F. FLETCHER.

Witnesses:

JOHN C. WILSON,
PERCY C. BOWEN.