

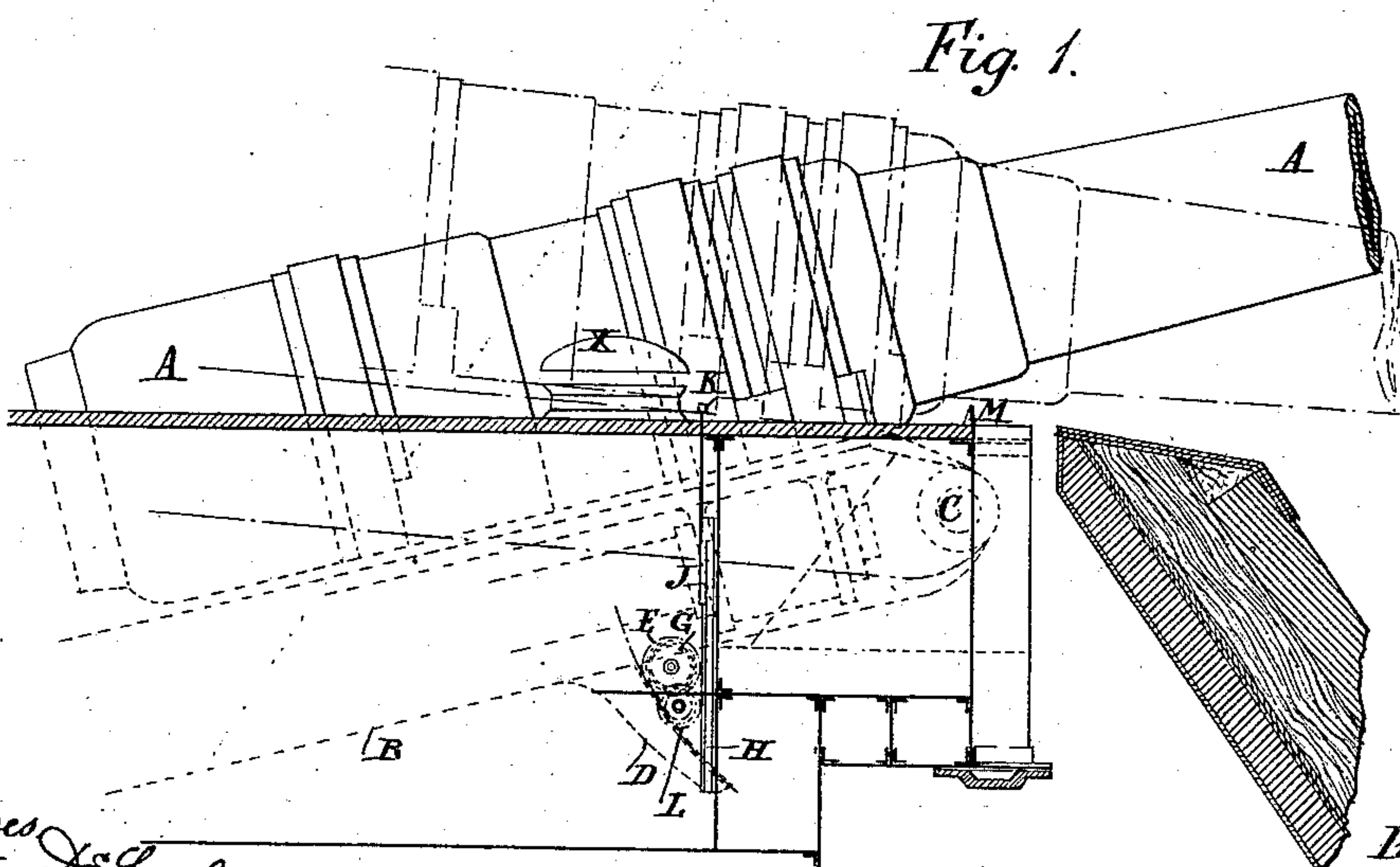
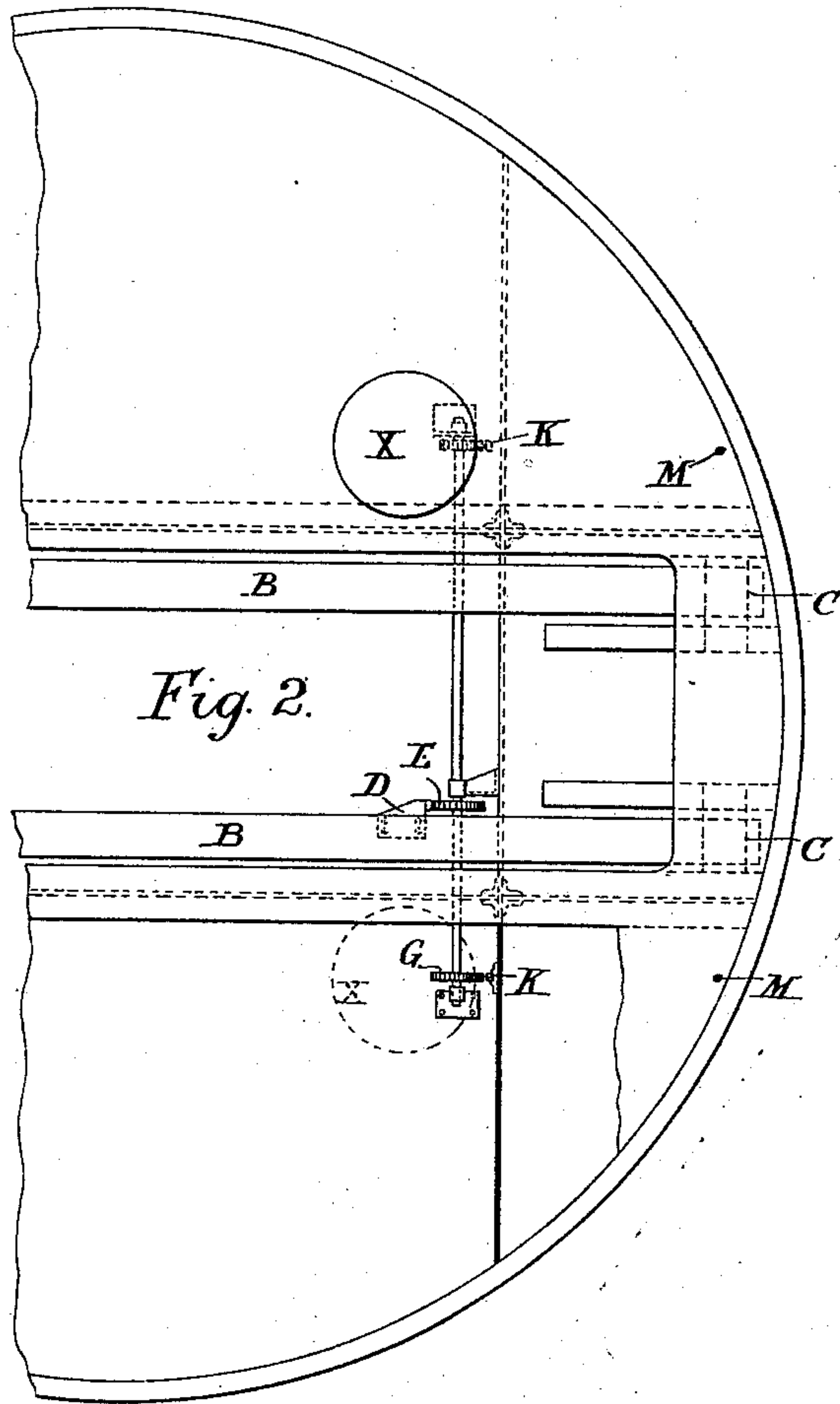
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5 Sheets—Sheet 1.

A. NOBLE & C. H. MURRAY.
AUTOMATIC SIGHT FOR TURRET GUNS.

No. 370,156.

Patented Sept. 20, 1887.



Witnesses
Bathus D. Long.
Lloyd B. Wright

Inventors
A. Noble.
C. H. Murray.
By attorneys—
Baldwin, Hopkins & Payton.

(No Model.)

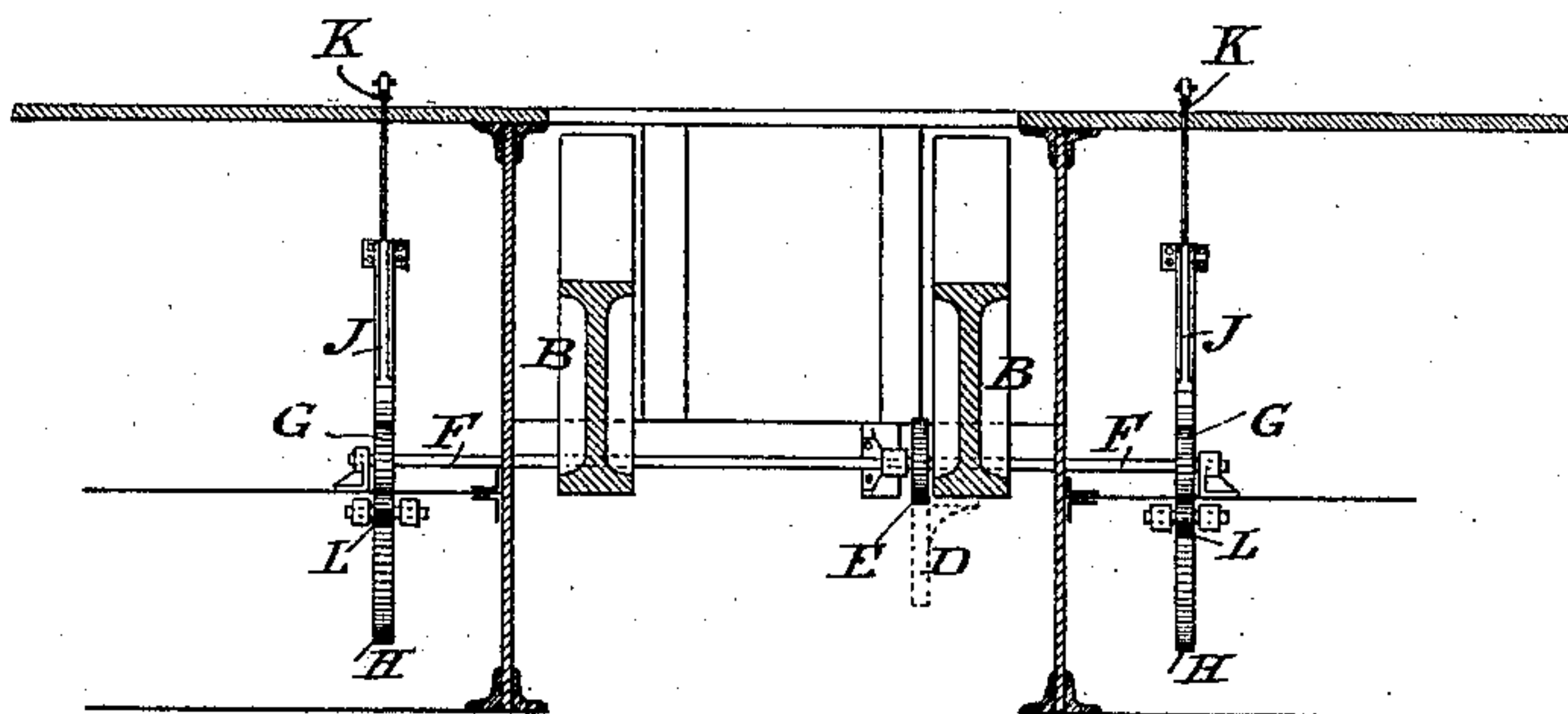
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Fig. 3.



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Fig. 5.

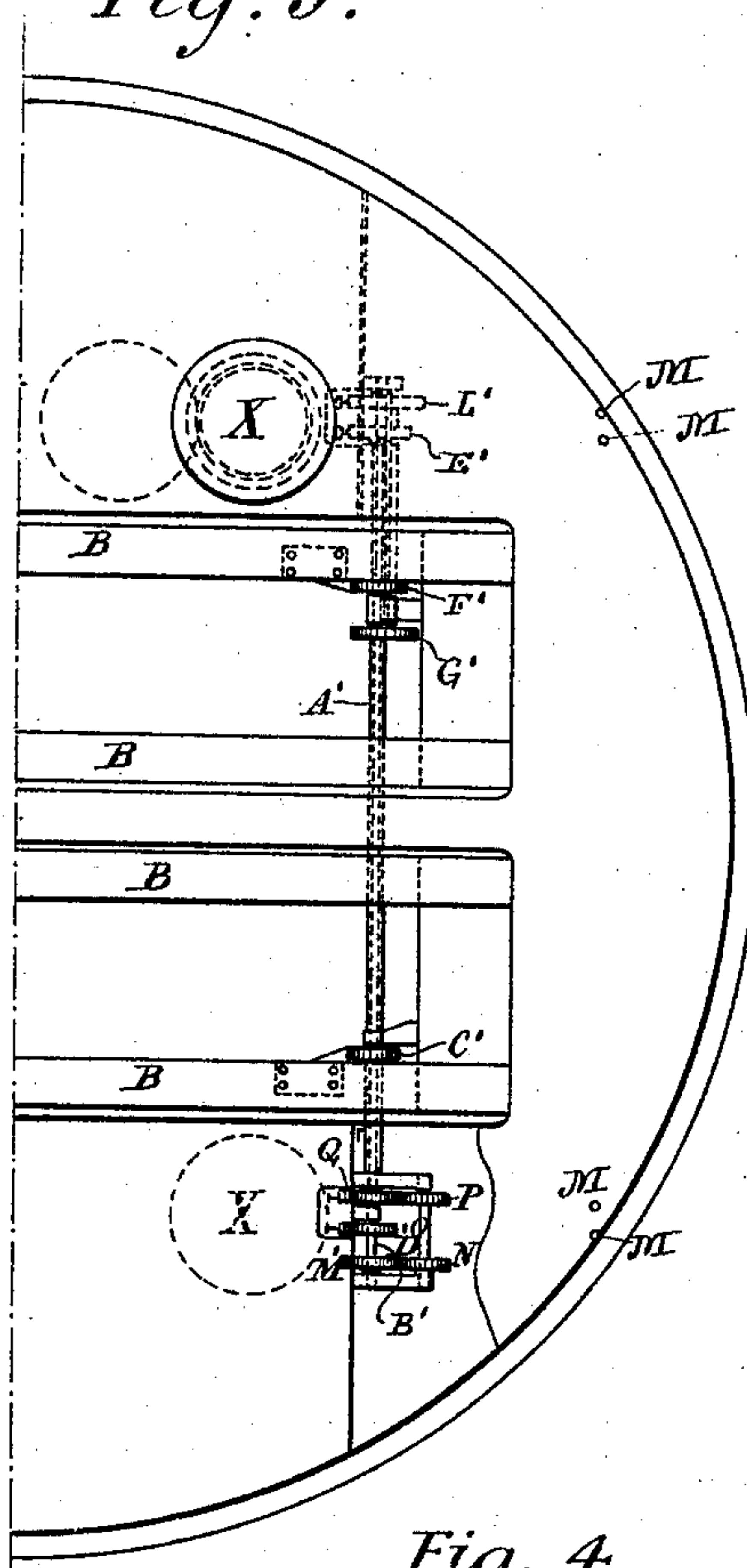
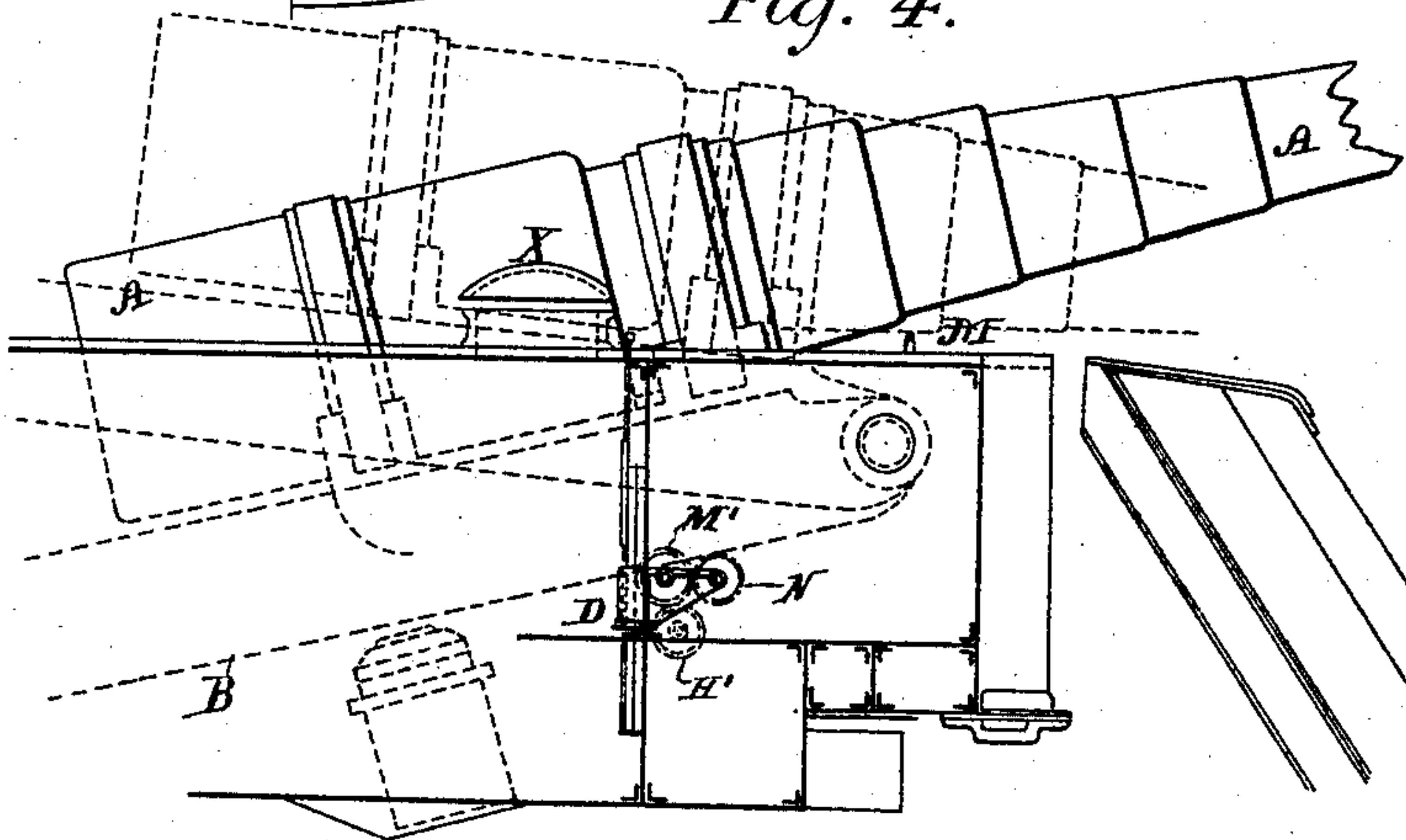


Fig. 4.



Witnesses

Baltus De Long

H. L. Holmes

Inventors.

A. Noble

C. H. Murray

By *John H. Hayton*
John H. Hayton

(No Model.)

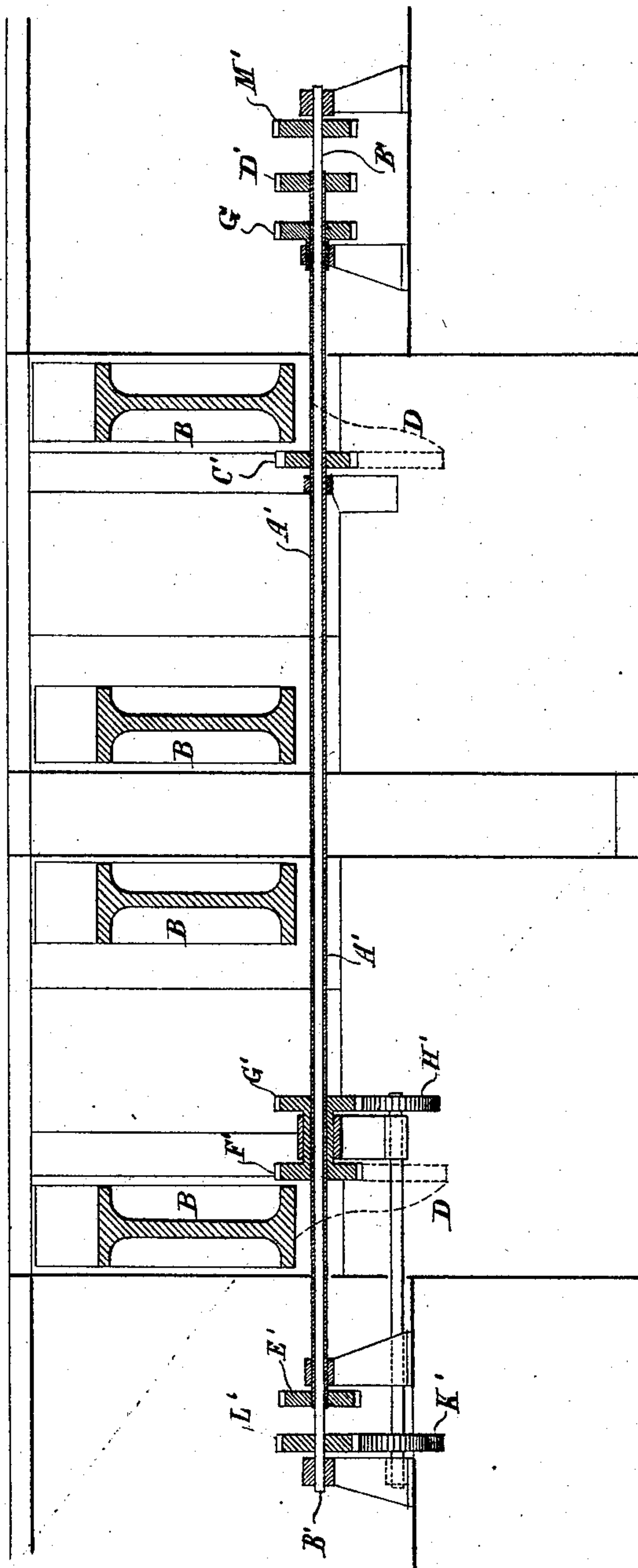
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A. NOBLE & C. H. MURRAY.
AUTOMATIC SIGHT FOR TURRET GUNS.

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Fig. 6.



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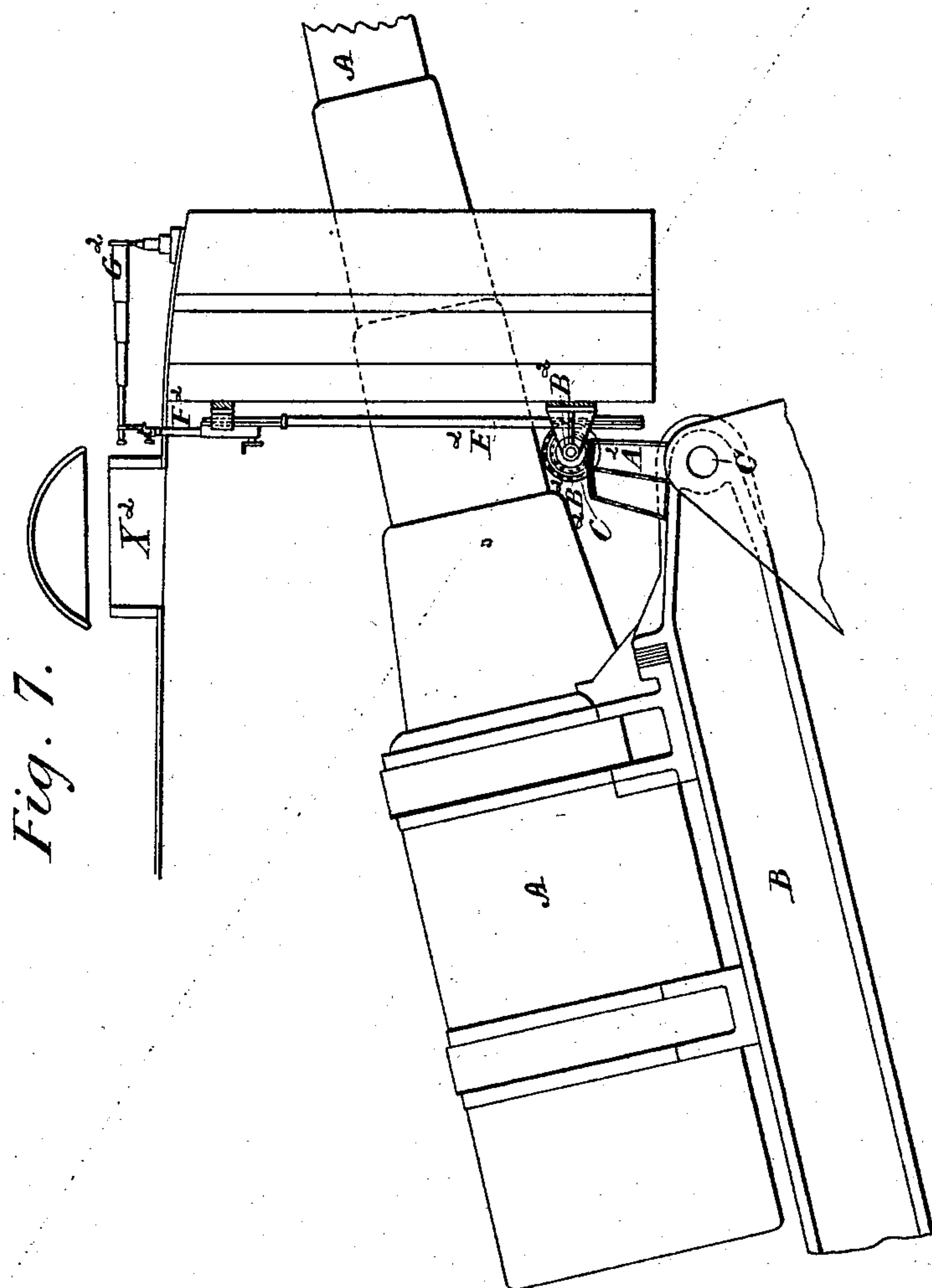
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UNITED STATES PATENT OFFICE.

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NEWCASTLE-UPON-TYNE, ENGLAND, ASSIGNORS TO W. G. ARMSTRONG,
MITCHELL & CO., (LIMITED,) OF SAME PLACE.

AUTOMATIC SIGHT FOR TURRET-GUNS.

SPECIFICATION forming part of Letters Patent No. 370,156, dated September 20, 1887.

Application filed May 7, 1887. Serial No. 237,660. (No model.) Patented in England January 6, 1885, No. 204.

To all whom it may concern:

Be it known that we, ANDREW NOBLE, of
The Elswick Works, in Newcastle-upon-Tyne,
England, Companion of the Bath, and CHARLES
5 HENRY MURRAY, of the same place, engineer,
subjects of the Queen of Great Britain, have
invented certain new and useful Automatic
Sights for Turret-Guns, (for which a patent
has been obtained in Great Britain dated Jan-
10 uary 6, 1885, No. 204,) of which the following
is a specification.

This invention has for its object automatic
sights for turret-guns. With these sights the
object sought is to enable a person having to
15 lay the gun to do so from a more convenient
or less exposed position than he would have to
occupy if the sights were affixed to the gun, as
is the usual practice in guns mounted on the
broadside of the vessel, and at the same time
20 to have as great accuracy and convenience as
would belong to sights fixed to the gun. The
back sights, placed in a convenient position,
are connected with the gun by intermediate
gearing. The fore sights are fixed to the gun-
25 supporting turn-table. For a single gun the
following arrangement is suitable: The gun,
being mounted on a slide, is elevated and de-
pressed by revolving the slide about its pivot.
A toothed arc is fixed below the slide, which
30 gears into a pinion, and this transmits motion
through a shaft to another pinion attached to
the other end of the shaft. The latter pinion
gears into a vertical rack which is affixed to a
bar or pillar carrying the rear sight at its up-
35 per end. An intermediate wheel is introduced
to reverse the motion when it is inconvenient
to have the toothed arc and the rack on the
same side of the axis. The fixed fore sight is
so arranged that a line connecting it with the
40 back sight would extend parallel with the
gun-slide. These sights are provided in du-
plicate, one set on either side of the gun. If
the distance from the pivot to the pitch-line of
the toothed arc differs from the distance be-
45 tween the back and fore sights, multiplying or
reducing power is provided in the gear-train.
The same system of sighting applies to the
case of two guns, and here the further object

sought is to have at either lookout-turret a
sight for each gun, so that the person having 50
to sight the guns may sight one first and then
the other without changing his position, or he
may have an assistant in the other lookout-
turret, whose duty it is to observe the move-
ment of the master-sight and place his sight 55
in the corresponding position. That the assist-
ant had done so or not would be seen by the
first person in his own lookout-turret. Under
these circumstances the secondary sight may
be considered to be only an indicator of the 60
position of the gun, and need not therefore be
completely fitted up, were it not that if made
complete then either station may be selected
for the leading position, and damage done to a
sight by its being struck with small shot would 65
be of less consequence, from the fact that the
other can be fallen back upon.

The guns are mounted on slides in the man-
ner previously described, and also in a simi-
lar way the sights are driven from toothed 70
arcs attached to the under side of the slides.
A pair of shafts run across under the slides.
One of them is a hollow shaft and contains the
other within it. The hollow shaft has a pin-
ion upon it gearing with the toothed arc on the 75
slide of, say, the right-hand gun, and other
pinions directly operating the sight-racks.
The toothed arc on the slide of the left-hand
gun gears with a pinion on a sleeve through
which the hollow shaft passes, and this by a 80
counter-shaft and gear-wheels transmits the
movement to the inner shaft of the pair. This
latter has upon it at the one end a spur-wheel
operating directly one of the sight-racks for
the left-hand gun, and at the other end a spur- 85
wheel which, through a counter-shaft and in-
termediate gear-wheels, operates the other
sight-rack. The pinion gearing with the
sight-rack is on a sleeve through which the
hollow shaft passes. By this arrangement it 90
will be seen that in each sighting position the
sight belonging to the right-hand gun is on
the right-hand side, and for the left-hand gun
on the left-hand side.

Where the guns are mounted in a turret 95
and it is possible to select a lookout-station

between them and well forward, a much simpler modification of these sights may be arranged. Here the motion of the right sight is obtained by fixing two arcs to the gun-slides
5 on the top side. In each case the arc gears into a pinion which, by means of the short shaft, drives a wheel gearing into a vertical pillar or rod which carries at its upper end the rear sight.

10 If thought desirable, a telescope may be carried between the rear and fore sight. This would enable a very accurate sight to be taken.

In order that our said invention may be most fully understood and readily carried into effect,
15 we will proceed to describe the drawings hereunto annexed.

In the drawings, Figure 1 is an elevation, partly in section, showing our invention applied to a gun on a slide carried on a turn-
20 table and firing over a parapet. Fig. 2 is a plan of part of the turn-table slide and other parts. A portion of the covering of the turn-table on the right-hand side is removed. Fig. 3 is a transverse vertical section of the same. Figs.
25 4, 5, and 6 show similar views of the modified arrangement when a pair of guns are mounted side by side on the turn-table. Fig. 7 shows in side elevation a further modified arrangement which may be used either when a single
30 gun or two parallel guns are carried by the turn-table. Part of the turret is shown in section.

A is the gun.

35 B is the slide along which the gun, with its carriage, recoils.

C is the pivot carried upon the turn-table, about which the slide moves to elevate and depress the muzzle of the gun.

40 D is a toothed rack attached to the slide concentric with the pivot. E is a pinion on a horizontal axis, F, with which this rack gears.

G is another pinion on the same axis with the pinion E. It drives an intermediate pinion, L, which engages with a vertical rack, H.
45 On the upper end of the rack H there is a fixture, J, carrying the back sight, K, with provision for raising or lowering this sight according to the elevation required to be given to the
50 gun.

M is the fore sight fixed to the turn-table.

The apparatus is duplicated on the other side of the gun.

55 As already stated, the rack D may, when space allows, be on the other side of its pinion, and an intermediate pinion, L, will not then be required. The distance between the fore and back sights may be varied without altering the distance of the rack D from the pivot,
60 the intermediate gear connecting the racks D and H only being changed.

X X are lookout-stations from which the sights are used.

65 If the line of aim were always horizontal, it would not matter at all about the distance between the front and rear sights, as may be seen

in the case represented in these figures, where the gun is at twelve degrees of elevation and the line of aim is horizontal. It is here clear that the fore sight may be moved away from
70 or up to the rear sight without disturbing the aim. As, however, the line of sight or aim is sometimes required to be slightly inclined to the horizontal, it is desirable to keep the gear so that the angular movement of the sights is
75 true to the angular movement of the gun. If there is to be no multiplying or reducing power in the train of gear, then it is evident that to effect this the length of the radius from the pivot C to the pitch-line on the toothed rack
80 D must be the same as the distance between the sights; but if a difference is unavoidable the necessary correction can be made by varying the size of one or other of the pinions E G. In the arrangement here shown the sights have
85 been brought as far forward as possible and are kept very low, in order that a more extended range of view may be had under the gun than would otherwise be possible.

It should be stated that the handles by which
90 the elevation of the gun is changed are brought close up to the sights, so that the gun may be moved while the aim is being taken over the sights. It is therefore unnecessary to observe the position taken up by the gun, as the sight
95 is an index of this.

In Figs. 4, 5, and 6 the guns shown are mounted on carriages and slides like the gun shown in the previous figures, and in a similar way the sights are driven from a toothed arc
100 attached to the under side of the slide. A pair of shafts, A' and B', run across under the slide. A' is a hollow shaft having the shaft B' within it. The shaft A' has keyed to it the pinion C', which gears into the arc on the right-hand slide.
105 This shaft works the sight of the right-hand gun in each of the lookout positions. At its extreme ends are attached the pinions D' and E', which gear into the upright racks carrying the sighting-pillars. The sights of the left-
110 hand gun are driven from the pinion F', which, by a short hollow shaft, is attached to the pinion G', which gears into pinion H', which, by a counter-shaft, is attached to pinion K', gearing into pinion L', attached to the main shaft
115 B'. The upright rack carrying the sight-pillar on the left side gears also into L'. To drive the sight on the right side, the shaft B' has attached to it the pinion M', which drives pinion N, and by the counter-shaft O it drives pinion P, gearing into pinion Q, which is also geared into the vertical rack carrying the sight-pillar on the right-hand side.

In Fig. 7 one of two guns mounted in a turret is shown in elevation. The lookout-station
125 X² in this case is between and above the guns. On each gun-slide an arc, A², is fixed. It gears with a pinion, B², on a short shaft, D², which also carries the pinion C². This pinion gears with rack-teeth on the vertical pillar E², and
130 this carries the back sight, F². The sights may support a telescope, G².

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is—

- 5 1. The combination of the gun-support or turn-table, the pivoted gun-slide, a fixed fore sight and an adjustable back sight, both carried by the turn-table, and gearing connecting the back sight with the gun-slide, whereby the
10 angular movement given to a line drawn between the sights always corresponds with the angular movement given to the gun-slide as its inclination is varied, substantially as set forth.
- 15 2. The combination of the gun-support or turn-table, two gun-slides pivoted thereon side by side, two shafts, one within the other, supported below the gun-slides, the racks on the gun-slides, a pinion fixed on the outer shaft and gearing with the rack on one of the
20 gun-slides, a pinion loose on the outer shaft and geared with the rack of the other gun-slide, the counter-shaft geared with said loose pinion, the pinion fast at one end of the inner shaft and geared with the counter-shaft, the
25 four adjustable sights, their attached racks,

the pinions at the ends of the outer shaft gearing into two of the sight-racks, the pinion at one end of the inner shaft gearing with another of said racks, the pinion at the opposite end of the inner shaft, the counter-shaft geared 30 therewith, and the loose pinion on the outer shaft geared with said counter-shaft and with the remaining sight-rack, substantially as set forth.

3. The combination of a gun-slide pivoted 35 at its front end on a horizontal pivot, the gun sliding thereon, a toothed rack attached to the slide concentric with the pivot, a pinion gearing therewith and carried by a horizontal axis, on which is another pinion or pinions gearing 40 with a vertical rack or racks, which carry a back sight or sights at the side or sides of the gun, and a fixed front sight, substantially as described.

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