

Oct. 23, 1923.

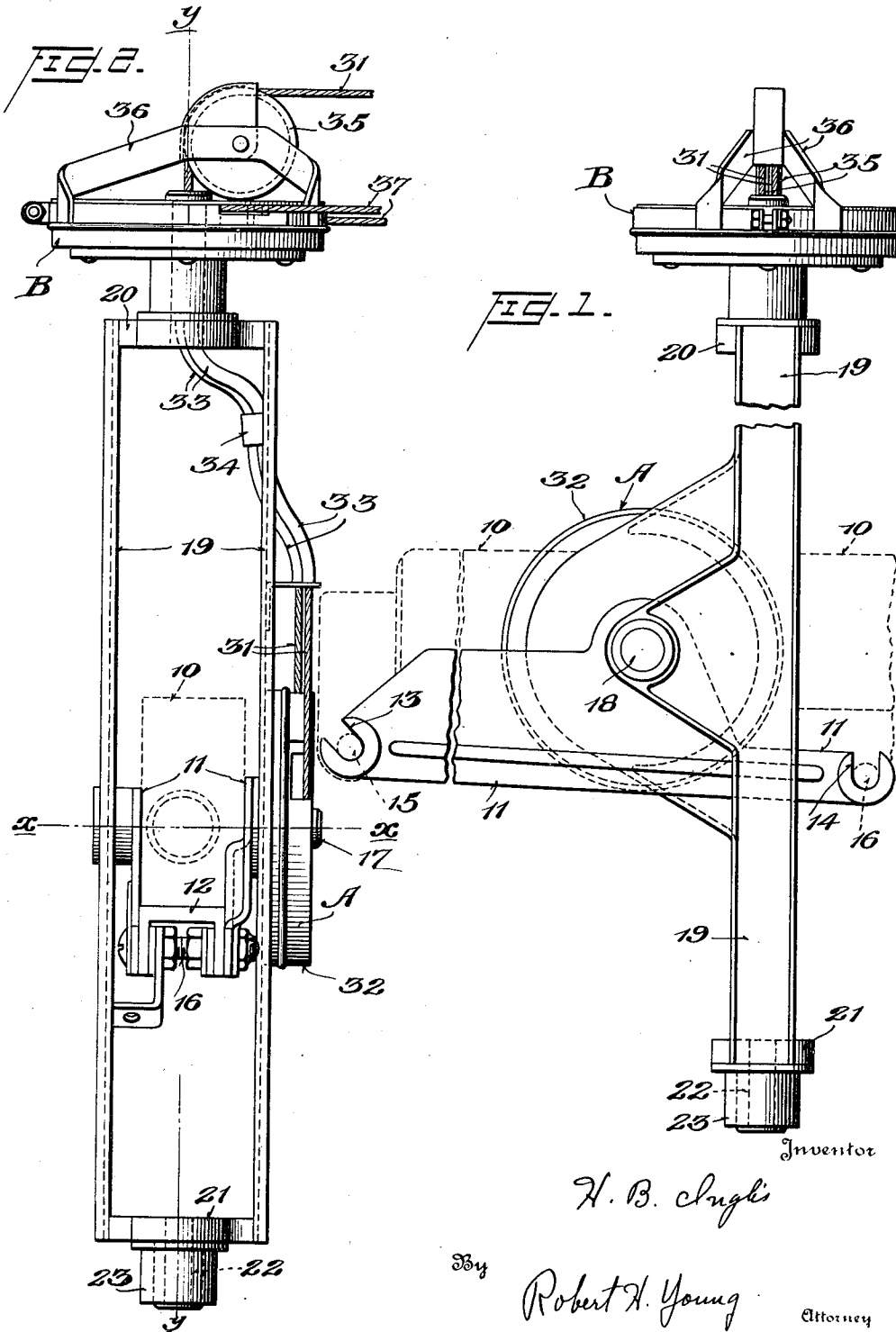
H. B. INGLIS

1,471,398

GUN MOUNT WITH REMOTE CONTROL

Filed April 30, 1923

3 Sheets-Sheet 1



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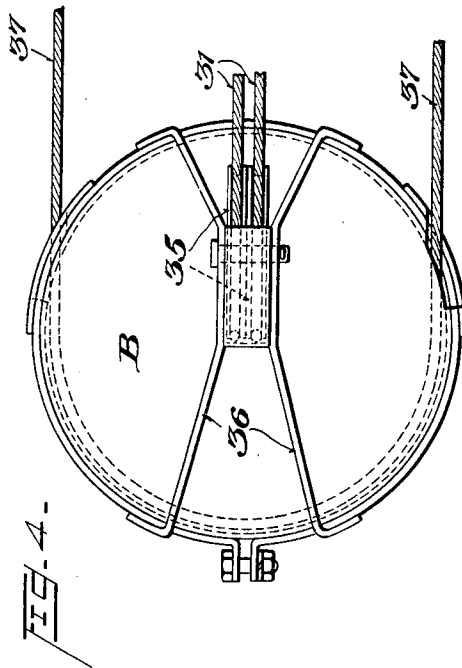
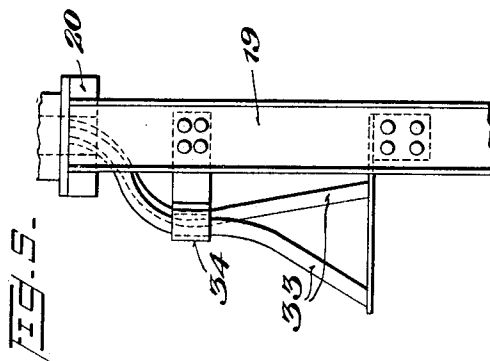
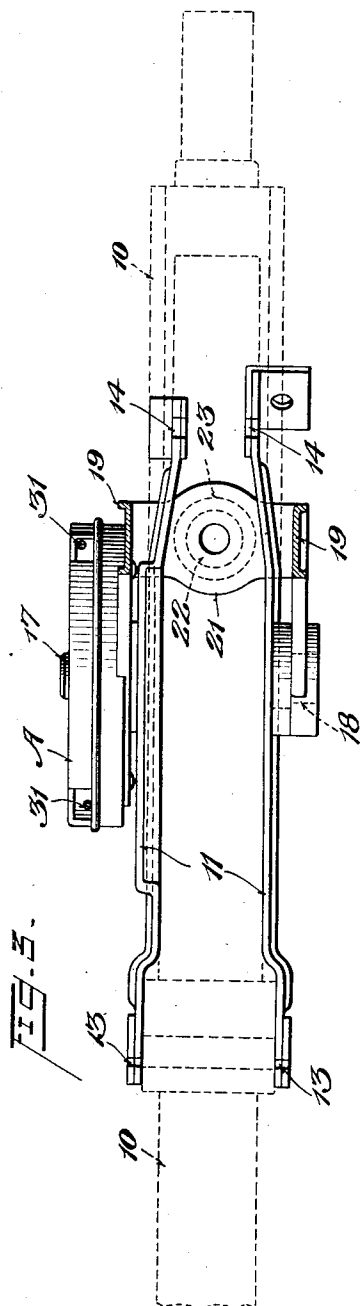
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3 Sheets-Sheet 2



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FIG. 6.

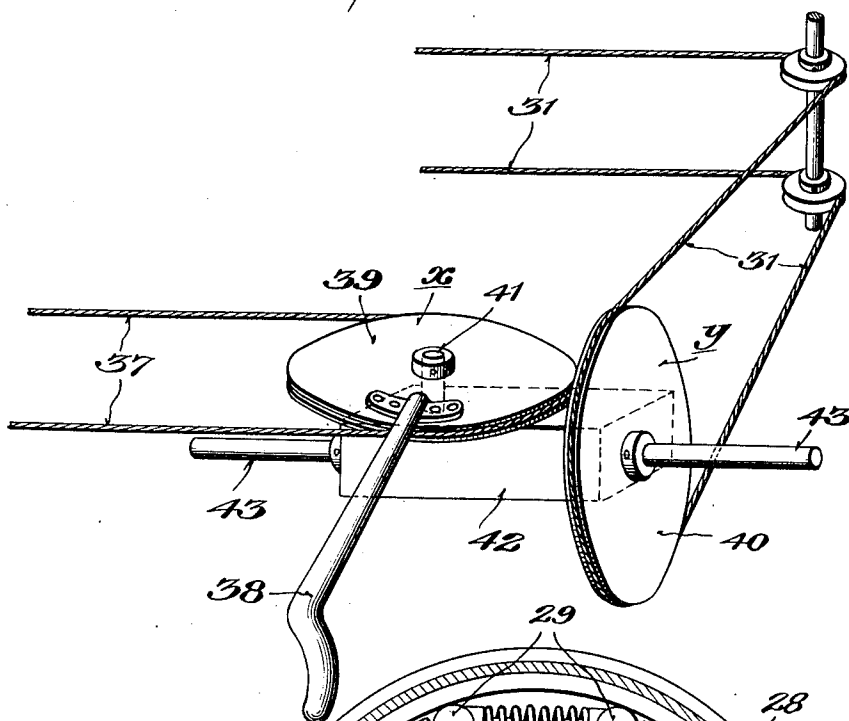
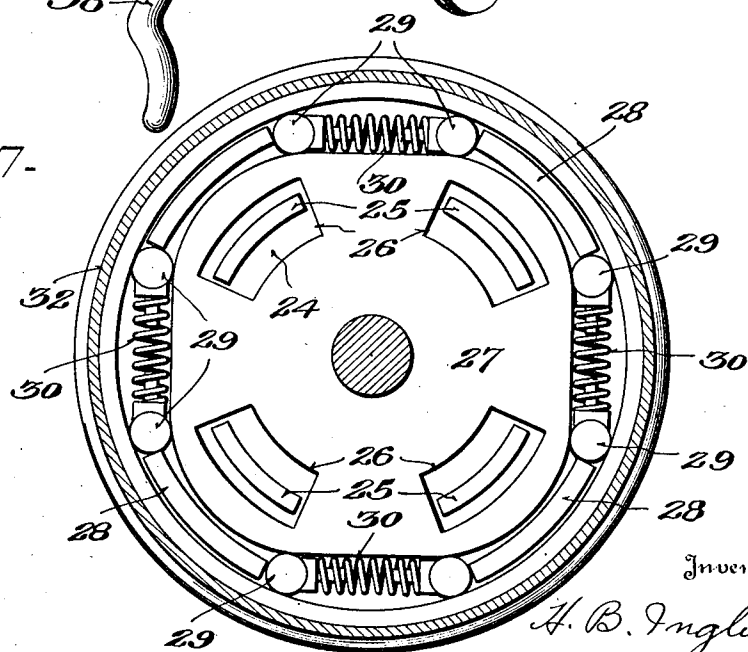


FIG. 7.



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UNITED STATES PATENT OFFICE.

HENRY B. INGLIS, OF DAYTON, OHIO.

GUN MOUNT WITH REMOTE CONTROL.

Application filed April 30, 1923. Serial No. 635,772.

To all whom it may concern:

Be it known that I, HENRY B. INGLIS, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Gun Mounts with Remote Control, of which the following is a specification.

This invention relates to a gun mount for flexibly mounted aerial guns and remote controlling means therefor.

The object of the invention is to provide in conjunction with a flexibly mounted gun capable of being aimed in any direction, means for locking the gun in any position, combined with intuitive controlling means operable from a distance or point remote from the gun for releasing the gun-locking means and turning or swinging the gun. The controlling means embodies a control handle remote from the gun and connected therewith by cable linkages in such manner that initial pressure on the handle in the act of aiming the gun will release the locking means, and continued pressure on the handle in the same direction will turn or swing the gun; upon relaxing the handle the gun will be held rigidly by the locking means and the direction of gun fire will not be dependent upon the gunner's holding the control handle.

In the illustrated embodiment of the invention, the control handle parallels at all times the barrel of the gun but is located and operable at a point remote from the gun. The gun may, for example, be mounted in or on the rear end of an airplane fuselage while the control handle may be arranged in the gunner's cockpit a considerable distance ahead; in such case the movement of the handle, when swung or turned through a given arc, will produce a corresponding movement of the gun. The gunner thus aiming with the control handle imparts a corresponding aiming movement to the gun. As soon as movement of the control handle ceases the gun is held locked.

The invention consists in the combination and arrangement herein shown, described and claimed.

In the accompanying drawings:—

Fig. 1 is a view partly in side elevation and partly in section of gun and controlling means.

Fig. 2 is view partly in rear elevation and partly in section of the same.

Fig. 3 is a plan view thereof partly broken away in section.

Fig. 4 is a top plan view of the vertical axis locking mechanism housing.

Fig. 5 is a fragmentary side elevation showing one of the cable guide brackets on the gun frame.

Fig. 6 is a perspective view of the duplex control handle.

Fig. 7 is a sectional view of one of the locking mechanisms.

The gun 10 is shown as directly supported by a saddle or inner frame consisting of parallel side plates 11 rigidly connected by one or more cross tie frame members 12 and having notches 13 and 14, to receive trunnion bolts or studs 15 and 16 of the gun which is thus capable of removal from the saddle.

Trunnions 17 and 18 on the saddle plates 11 are received in bearing openings in the side upright members 19 of a gun frame also embodying top and bottom cross members 20 and 21. The saddle is thus adapted to be turned or swung on the horizontal axis $x-x$. The gun frame 19, 20, 21, has at its lower end a vertical stem 22 journaled in a bearing 23 in the stationary part of the gun mount (not shown) thus adapting the gun frame to be turned on the vertical axis $y-y$. Thus the gun is universally mounted or supported by a double gimbal mount, so that the gun may be turned, swung and aimed in any direction.

Two gun locking mechanisms are employed one A to prevent the gun from turning on the axis $x-x$, and another B to prevent the gun from turning on the axis $y-y$. Either one of these locking mechanisms may be released separately or both of them may be released simultaneously by distantly located and operable means hereinafter described. As the two locking mechanisms are alike in construction and operation and no claim to novelty of the locking mechanism per se is made herein, a brief description of one of said locking mechanisms will be sufficient.

Take for example the locking mechanism A which is used to prevent the gun from turning about the horizontal axis $x-x$. The trunnion 17 has fast thereon a wheel or pulley 24 with fixed projecting take up lugs 25 curved as shown to be concentric to the axis $x-x$ and slightly less in length than the slots 26 in a cam 27 in which said lugs

work. Similarly shaped lugs 28 on the pulley 24 extend between clutch rollers 29 operating between the periphery of cam 27 and the inner face of the rim of the pulley the rollers 29 being held in clutching position by expansion springs 30 interposed between each pair of rollers 29. A flexible control cable 31 passes around and is fastened to the pulley 24 and a housing 32 surrounds the whole.

When the control cable 31 is operated by a pull thereon, the first effect is to cause the lugs 28 to push the rollers 29 out of clutching position, after which the lugs 25 take up the cam 27 imparting a rotative movement thereto and to the trunnion 17 and therefore to the gun. As soon as the pull on the cable is relaxed the clutch means become effective and no further turning movement of the gun on the axis $x-x$ is permitted. The locking mechanism B operates in the same way with regard to the movement of the gun about axis $y-y$.

The cable 31 runs through suitable guides or fairleaders 33 on a bracket 34 on the gun frame, then through the center of the locking mechanism B, as shown in Fig. 2 and over pulleys 35 supported by a bracket 36 on the housing of locking mechanism B. Another control cable 37 is used to operate mechanism B.

The control handle 38 (see Fig. 6) may be placed at any required distance from the gun and its mounting and the locking, releasing and turning mechanisms above described. Said control handle operates two pulleys 39 and 40 and is fixedly secured to the pulley 39 which is used to exert a pull on the cable 37 that controls the locking mechanism B. Pulley 39 is journaled on a stud shaft 41 on a pulley block 42, stud shaft 41 being at a right angle to the shaft or trunnions 43 about which said block is rotatable. Pulley 40 is fixed in relation to block 42 and turns with the block when the latter is rocked or turned by depressing or raising the handle 38. The cable 31 which operates to release the locking mechanism A passes around the pulley 40 which exerts a pull on said cable when turned. The handle 38 is preferably arranged in parallelism with the barrel of the gun so that when the handle is raised or lowered the gun is correspondingly raised or lowered, and when the handle is swung laterally the gun is swung laterally to the same degree. The handle when moved in a direction the component of above directions will cause a corresponding movement of the gun. Thus the two locking mechanisms may be released individually or concurrently and the gun may be adjusted in elevation or lateral sweep. It will also be apparent that pressure on the handle in any given direction will first release one or both of the locking mechanisms and a continuation of

such pressure in the same direction will swing the gun in the same direction and to the same extent, the control handle and the gun maintaining parallelism at all times. Upon releasing the handle 38, the locking mechanisms become at once effective and therefore the gun fire is not dependent upon the gunner's holding the control handle.

I claim:—

1. In combination, a flexibly mounted gun movable about two axes of rotation, locking mechanisms for preventing movement about said axes, and controlling means operable at a point remote from the gun for releasing either or both of said locking mechanisms and turning the gun.

2. In combination, a flexibly mounted gun movable about two axes of rotation, locking mechanisms for preventing movement about said axes, and controlling means operable at a point remote from the gun for releasing either or both of said locking mechanisms and turning the gun, said controlling means including flexible cables.

3. In combination, a flexibly mounted gun movable about two axes of rotation, locking mechanisms for preventing movement about said axes, and controlling means operable at a point remote from the gun for releasing either or both of said locking mechanisms and turning the gun, said controlling means embodying a manually operable control handle, and flexible cables connecting said handle with the locking mechanisms.

4. In combination, a flexibly mounted gun movable about two axes of rotation, locking mechanisms for preventing movement about said axes, and controlling means operable at a point remote from the gun for releasing either or both of said locking mechanisms and turning the gun, said controlling means embodying gun-turning members for moving the gun about said axes, gun-turning members for rotating the gun about said axes, locking mechanisms acting normally to prevent movement of said gun-turning members, and controlling means operable at a point remote from the gun for releasing either or both of said locking mechanisms and swinging the gun about either or both of the axes thereof, a manually operable control handle at a point remote from the gun, and flexible cables leading from said handle to the gun-turning members.

5. In combination, a flexibly mounted gun movable about two axes of rotation, gun-turning members for rotating the gun about said axes, locking mechanisms acting normally to prevent movement of said gun turning members, and controlling means operable at a point remote from the gun for releasing either or both of said locking mechanisms and swinging the gun about either or both of the axes thereof.

6. In combination, a flexibly mounted gun

movable about two axes of rotation, gun-
turning members for rotating the gun about
said axes, locking mechanisms acting nor-
mally to prevent movement of said gun
5 turning members, and controlling means
operable at a point remote from the gun for
releasing either or both of said locking
mechanisms and swinging the gun about
either or both of the axes thereof, said con-
10 trolling means including a manually oper-
able handle, and operating cables extending
therefrom to the gun-turning members and
adapted to release the locking mechanisms
and turn the gun.
15 7. In combination, a flexibly mounted gun
movable about two axes of rotation, locking
mechanisms for preventing movement about
said axes, and controlling means operable
at a point remote from the gun for releasing
20 either or both of said locking mechanisms
and turning the gun, said controlling means
embodying a remote single control handle
and flexible cable linkages between said
handle and gun locking and turning means,

adapted through first pressure on the con- 25
trol handle to release one or both locking
mechanisms and upon further pressure in the
same direction to swing the gun about either
or both of said axes.

8. In combination, a flexibly mounted gun 30
movable about two axes of rotation, locking
mechanisms for preventing movement about
said axes, and controlling means operable
at a point remote from the gun for releasing
either or both of said locking mechanisms 35
and turning the gun, said controlling means
embodying a remote single control handle
and flexible cable linkages between said
handle and gun locking and turning means,
said handle being maintained in parallelism 40
with the barrel of the gun in all positions
thereof and adapted through first pressure
on the control handle to release one or both
locking mechanisms and upon further pres-
sure in the same direction to swing the gun 45
about either or both of said axes.

In testimony whereof I affix my signature.
HENRY B. INGLIS.