April 4, 1933. A. DABRASKY ET AL 1,903,288

CARTRIDGE FEED MECHANISM

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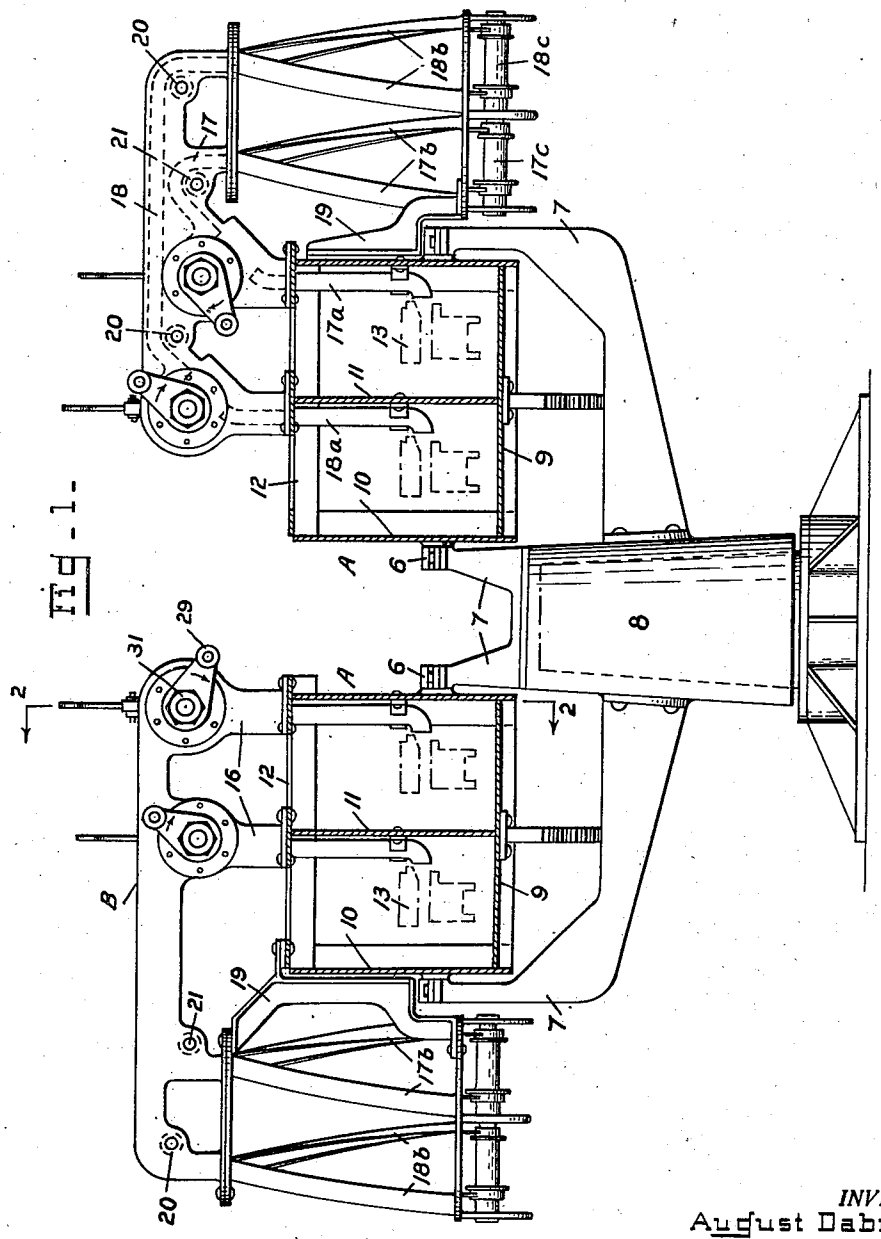


Fig. 1.

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Fig - 3 -

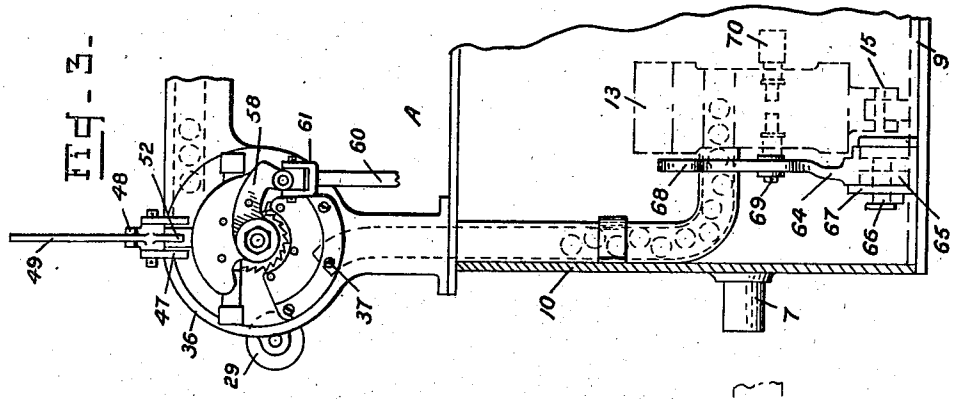


Fig - 4 -

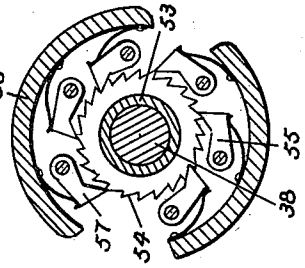


Fig - 2 -

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UNITED STATES PATENT OFFICE

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CARTRIDGE FEED MECHANISM

Application filed February 23, 1932. Serial No. 594,648.

(GRANTED UNDER THE ACT OF MARCH 3, 1883, AS AMENDED APRIL 30, 1928; 370 O. G. 757)

The invention described herein may be manufactured and used by or for the Government for governmental purposes without the payment to us of any royalty thereon.

The subject of this invention is a cartridge feed mechanism particularly adapted for multiple gun mounts and is a modification of the mechanism disclosed in Patent No. 1,842,446 of January 26, 1932.

In the patent belts of ammunition are carried on the base of the gun mount and are elevated through the tipping cradle to the guns through the action of recoil cradles. In this arrangement the guns must be relatively high and as a consequence the mount must be of excessive weight to afford the requisite stability.

With a view to providing a low mounting for the guns it is proposed in the present invention to supply the belts of ammunition from the sides of the cradle and conduct them sufficiently high above the guns to enable the covers of the guns to be raised in correcting malfunctions.

The invention also contemplates a novel feed mechanism operated by the breech bolt on recoil and including driving pawls on the driving side of a clutch mechanism so that upon interrupting the drive the belt may be advanced or retracted.

With the foregoing and other objects in view, the invention resides in the novel arrangement and combination of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is claimed without departing from the spirit of the invention.

Fig. 1 is a view in front elevation of the cradle of a multiple gun mount equipped with the improved cartridge feed mechanism.

Fig. 2 is a view in side elevation thereof with parts in section on the line 2—2 of Fig. 1.

Fig. 3 is a view in rear elevation of the feed mechanism for one of the guns.

Fig. 4 is a sectional view on the line 4—4 of Fig. 2.

Referring to Fig. 1 there is shown a multiple gun mount consisting of a pair of similar cradles A—A supported by means of trunnions 6 in the four upright arms 7 of a rotatable base 8.

Each of the cradles consists of a base plate 9, side plates 10, and dividing plate 11 and a cross-rail 12. In each of the compartments thus formed there is a machine gun 13 secured in a conventional manner to the base plate by a front coupling 14 and a rear coupling 15 (Fig. 2).

The feed mechanism for advancing a belt of cartridges to each gun includes a casing B positioned above the cradles A and having legs 16—16 secured to the cross-rail 12 and to the plates 10 and 11 as shown in Figs. 1 and 2. The casing is formed with a lower trackway 17 and an upper trackway 18 leading respectively to the outside and the inside gun through auxiliary trackways 17*a* and 18*a*. At the outside of each cradle A the trackways are connected to depending volute guides 17*b* and 18*b* carrying entrance rollers 17*c* and 18*c*. The volute guides are secured together and the inside one is attached to the outside plate 10 of the cradle by means of a bracket 19. Rollers 20 are associated with the upper trackway 18 while one or more rollers 21 are provided for the shorter lower trackway 17.

Referring to Figs. 1 and 2 the casing B consists more particularly of a front plate 22 and a rear plate 23 adapted to carry a belt advancing mechanism for each of the guns 13. This mechanism comprises a sprocket 24 terminating short of the rear plate 23 and rotatably supported in an anti-friction bearing unit 25 seated in an annular flange 26 on the front plate 22 and confined between the plate and a retaining ring 27 secured thereto. The sprocket is held against axial displacement by means of an integral collar 28 and a crank 29 engaging opposite faces of the bearing unit. The crank is secured to the sprocket through a key 30 and is retained thereon by a nut 31.

The unsupported end of the sprocket adjacent the rear plate is formed with an internal cone 32 arranged for driving engage-

ment by an external cone 33 on a clutch sleeve 34. The sleeve is rotatably supported in an anti-friction bearing unit 35 carried by a housing 36 that is secured to the rear plate 23 by screw bolts 37. A shaft 38 passing through the sleeve has a nut 39 on its rear end abutting against the rear face of the sleeve while the forward end of the shaft projects well into the sprocket and is threaded into a nut 40 having a sliding fit in the sprocket. A spring 41 embracing the shaft and confined between a washer 42 at the inner face of the nut 40 and an internal flange 43 on the sprocket acts to normally hold the clutch sleeve 34 in driving engagement with the sprocket.

The clutch sleeve is movable out of engagement with the sprocket by means of a lever 44 having the usual fork 45 riding in a groove 46 of the sleeve. The upper portion of the lever passes between spaced ears 47 on the housing 36 and terminates in an angled extremity 48 that is normally held against an actuating lever 49 by a spring 50. The lever 49 is fulcrumed on a pin 51 mounted in the ears 47 and has an angled toe 52 normally bearing against the lever 44 at a point intermediate the angled extremity 48 and the spring 50. By this arrangement the actuating lever may be moved in opposite directions to disengage the clutch sleeve.

The clutch sleeve is formed with a collar 53 having ratchet teeth 54. On the lower side these teeth are engaged by holding pawls 55 mounted in a carrier 56 that is rigidly secured to the housing 36 by the screw bolts 37. On the upper side the teeth are engaged by driving pawls 57 carried by a lever 58 having an enlarged hub 59 whereby it is mounted on the clutch sleeve between the collar 53 and the nut 39. As shown in Fig. 4 the pawls 55 and 57 are in groups of three, distributed over the pitch of the ratchet teeth, so that in the event of failure of one of them only one-third of the width of a tooth will be lost before the next pawl takes hold.

The lever 58 is connected to a link 60 through a universal joint 61 and the link in turn is connected through a universal joint 62 with a pin 63 threaded into a lever 64. The lever 64 is mounted through an anti-friction bearing unit 65 on a fulcrum 66 supported in ears 67—67 on the base plate 9 of the cradle. The upper arm of the lever 64 is provided with a cam slot 68 adapted to receive the reciprocating bolt handle 69 of the machine gun.

The operation of loading a belt of cartridges into the gun consists in manually inserting the end of the belt into one of the volute guides, 17*b* or 18*b* and then moving it into the corresponding trackway 17 or 18 until the first cartridge is engaged by the sprocket 24. The volute guides and trackways are of open design for the purpose of lightness and to accommodate the hand of the loader in this operation. Rotation of the sprocket through the crank 29 advances the belt the remaining distance to the gun and inserts the end round into the feedway.

For the purpose of manually retracting the breech bolt to initially load the gun a second handle 70 is provided opposite the handle 69.

During the recoil stroke of the bolt the handle 69 working in the cam slot 68 of the lever 64 cause the lever 63 to rock and elevate the link 60 and associated lever 58. Since one of the driving pawls 57 on the lever 58 is engaged with the ratchet wheel the sprocket will be partially rotated to advance the belt of cartridges. On the counterrecoil stroke of the bolt the levers will be returned to initial position and the holding pawls 55 will prevent counterrotation of the sprocket.

It will be noted from Fig. 3 that the feed mechanism is arranged to overfeed so that sufficient slack will be present to insure a free and easy delivery to the gun. Excessive overfeeding will be compensated by the slipping of the clutch due to back pressure on the sprocket.

The position of the pawls on the driving side of the clutch mechanism provides an advantage in that the sprocket may be disconnected from the actuating mechanism for the purpose of advancing or retracting the belt.

We claim:

1. In a gun mount, a cradle, a pair of guns carried by the cradle, a pair of associated trackways extending from one side of the cradle to the guns, the trackway for one gun passing above the other gun, means carried by each trackway for advancing a belt of ammunition, and means operable by the guns for intermittently actuating the advancing means.

2. In a gun mount, a cradle, a pair of guns carried by the cradle, a pair of associated trackways extending from one side of the cradle to the guns, the trackway for one gun passing above the other gun, and means carried by each trackway for advancing a belt of ammunition.

3. In a gun mount, a cradle, a pair of guns carried by the cradle, and means for guiding a belt of ammunition to each gun, said means extending from the side of the cradle to a position overhead the guns.

4. In cartridge feed mechanism, a cartridge belt guide, a sprocket mounted in the guide and having an internal cone at one end, a sleeve mounted in the guide and having an external cone adapted to engage the internal cone of the sprocket, a shaft passing through the sleeve and engaging one end thereof, a nut on the inner end of the shaft within the sprocket, a spring confined between said nut and the sprocket, ratchet teeth on the sprocket, holding pawls engag-

ing the ratchet teeth, a lever mounted on the sleeve, driving pawls carried by the lever and engageable with the ratchet teeth, and a lever for axially moving the sleeve.

5. In cartridge feed mechanism, a cartridge belt guide, sprocket mounted in the guide, a sleeve mounted in the guide and having a clutch engagement with the sprocket, a shaft within the sleeve and sprocket and having engagement with the sleeve, a spring seated on the sprocket and acting on the shaft to maintain the clutch engagement, teeth on the sleeve, a lever on the sleeve, pawls carried by the lever and engageable with the teeth, and means for axially moving the sleeve.

6. In cartridge feed mechanism, a support, a sprocket mounted in the support, a driving member mounted in the support and having a clutch engagement with the sprocket, means normally acting on the driving member to maintain the clutch engagement, teeth on the driving member, a lever on the driving member, pawls carried by the lever and engageable with the teeth, and means for declutching the driving member.

7. In cartridge feed mechanism, a belt advancing member, a driving member, means for normally maintaining a clutch engagement between said members, means for declutching the members, and means for intermittently rotating the driving member.

8. In a cartridge feed mechanism, a support, a driven member mounted in the support, a driving member, means for normally maintaining a clutch engagement between said members, a throw-out lever engaging one of said members and having an angled extremity, an actuating lever fulcrumed on the support and having an angled toe, a spring seated in the support and acting on the throw-out lever to hold its angled extremity against an intermediate portion of the actuating lever and to hold an intermediate portion of the throw-out lever against the angled toe of the actuating lever.

9. In a cartridge feed mechanism, a support, a driven member mounted in the support, a driving member, means for normally maintaining a clutch engagement between said members, a throw-out lever engaging one of said members, and an actuating lever fulcrumed on the support and having engagement with the throw-out lever on both sides of the fulcrum.

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