Feb. 16, 1937. L. A. BOUSSEL 2,071,020

PNEUMATIC RECOCKING DEVICE FOR MACHINE GUNS

Filed May 10, 1935 4 Sheets-Sheet 1

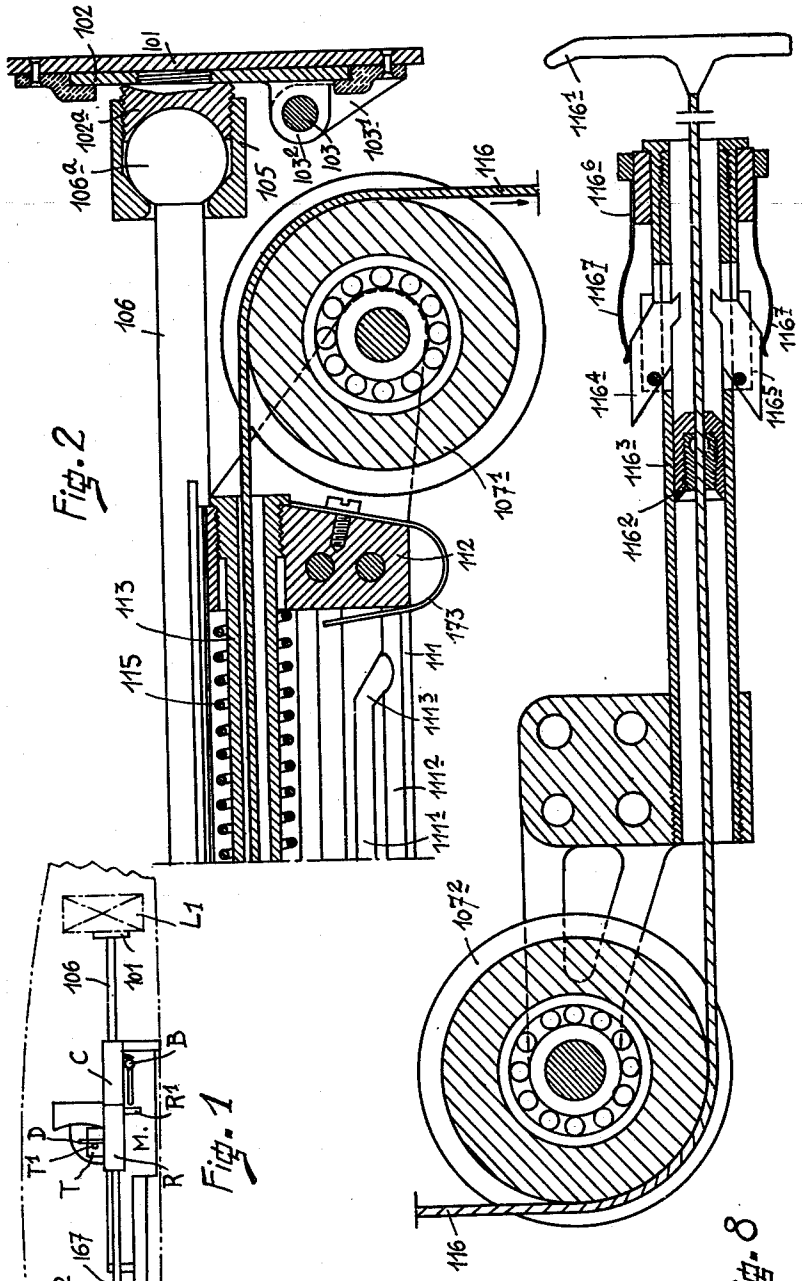


Fig. 2

Fig. 1

Fig. 8

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PNEUMATIC RECOCKING DEVICE FOR MACHINE GUNS

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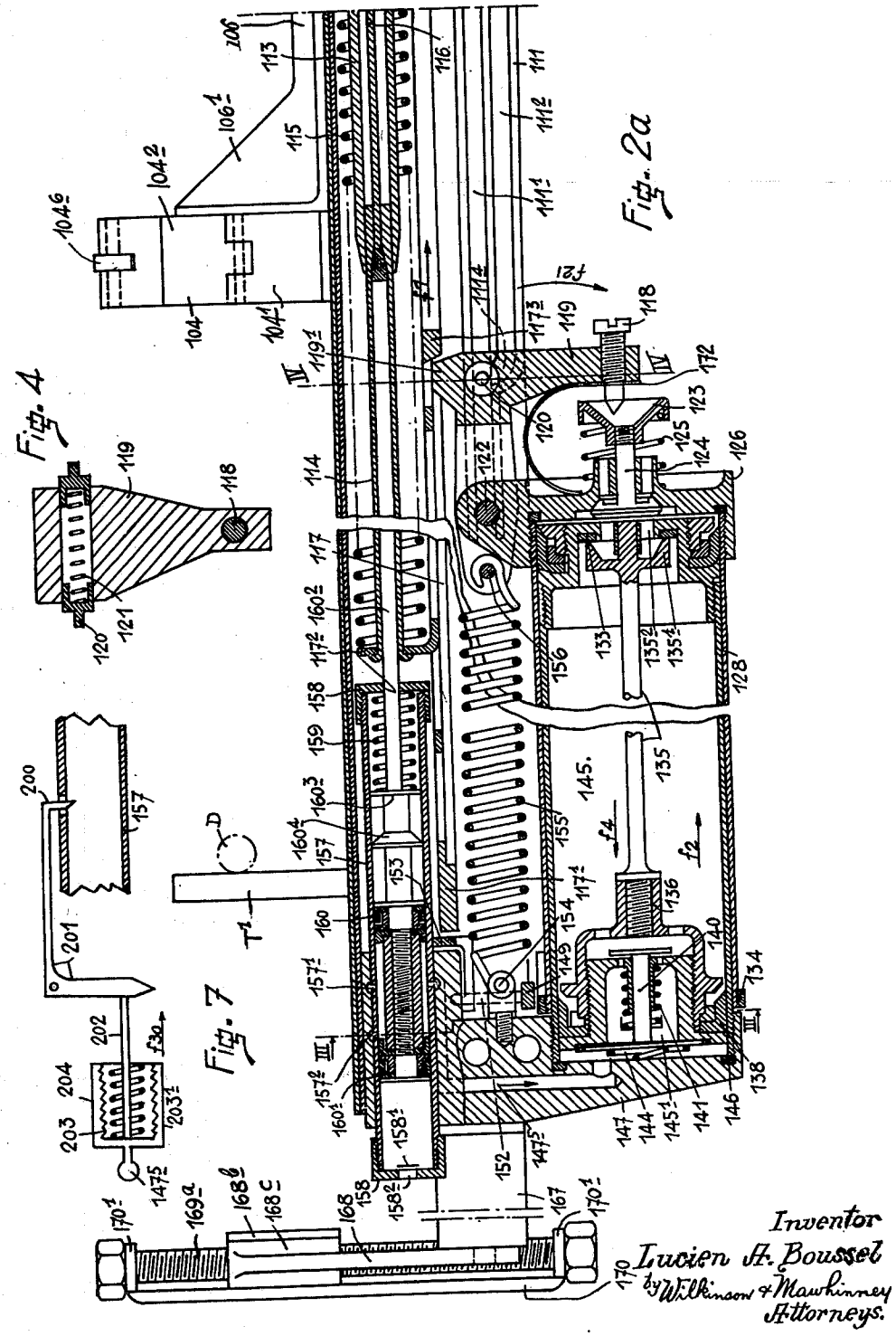


Fig. 2a

Fig. 4

Fig. 7

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PNEUMATIC RECOCKING DEVICE FOR MACHINE GUNS

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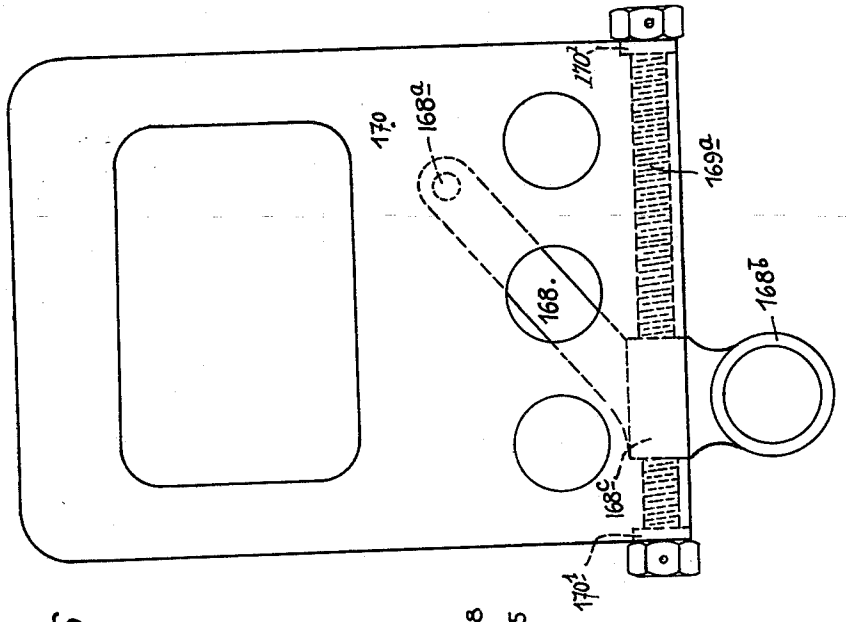


Fig. 6

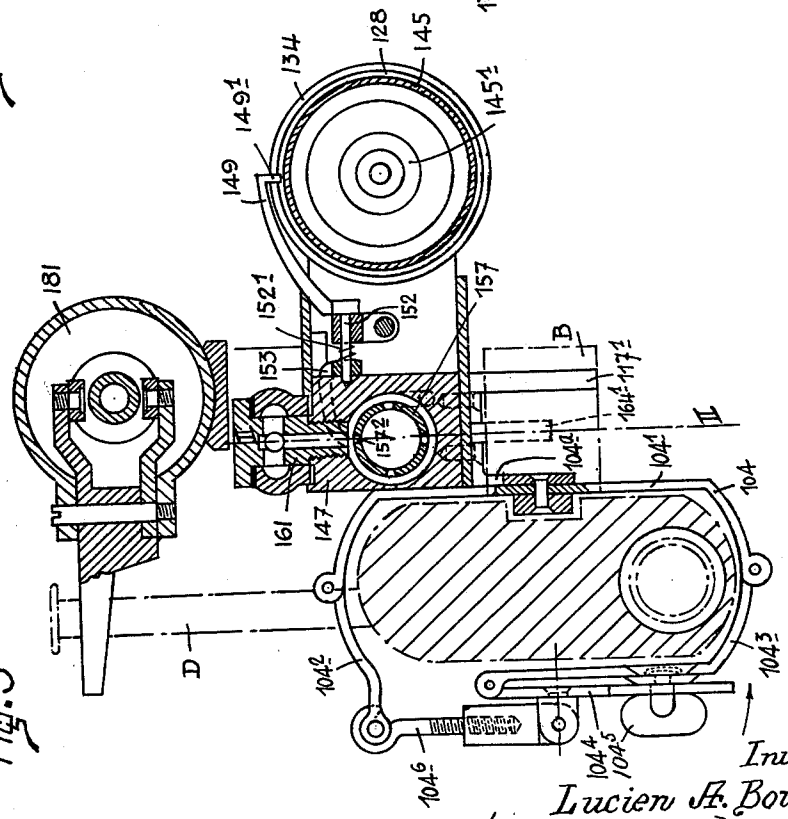


Fig. 3

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PNEUMATIC RECOCKING DEVICE FOR MACHINE GUNS

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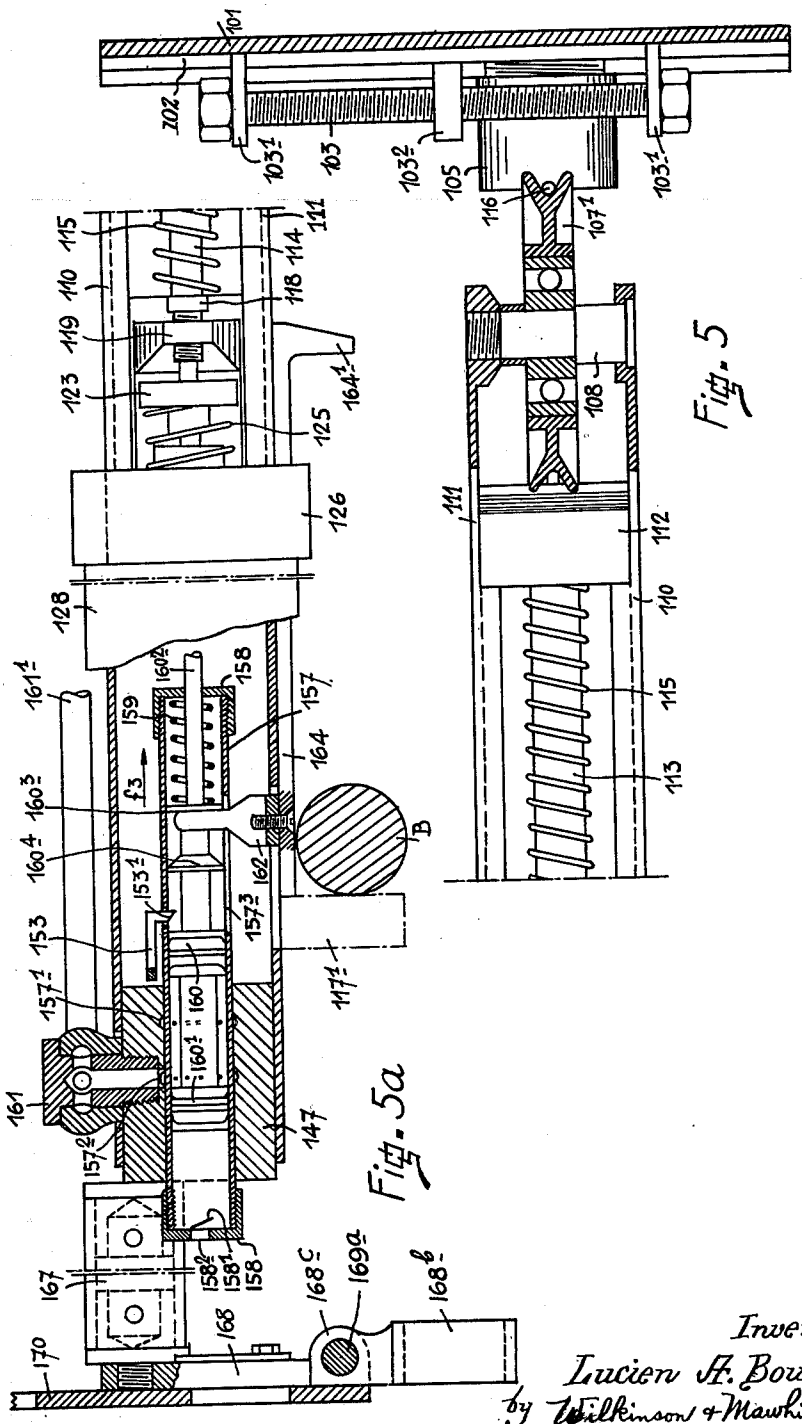


Fig. 5

Fig. 5a

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UNITED STATES PATENT OFFICE

2,071,020

PNEUMATIC RECOCKING DEVICE FOR MACHINE GUNS

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Application May 10, 1935, Serial No. 20,841
In France April 5, 1932

19 Claims. (Cl. 89—27)

The present invention concerns a pneumatic recocking device for recocking machine guns.

A device according to the invention is shown by way of example in the accompanying drawings, in which:

Fig. 1 is a transverse-section of an aeroplane wing in which is mounted a machine gun arranged according to the invention and shown in elevation.

Figs. 2–8 show the recocking device according to the invention on an enlarged scale;

Fig. 2 is a sectional plane of the rear (right-hand) part;

Fig. 2*a* is a sectional plane of the front (left-hand) part;

Fig. 3 is a vertical transverse-section on the line III—III of Fig. 2*a*;

Fig. 4 is a partial transverse-section on the line IV—IV of Fig. 2*a*;

Figs. 5 and 5*a* are elevations, partly in section, corresponding with Figs. 2 and 2*a*, respectively;

Fig. 6 is a partial front view (as seen from the left on Fig. 5*a*);

Fig. 7 is a diagrammatic longitudinal section of an auxiliary locking device and

Fig. 8 is a sectional plan of a part of an emergency recocking device.

The recocking device shown in Figs. 1–8 includes, on the one hand, supports for fixing same on an aeroplane and, on the other hand, fastening means enabling a machine gun to be readily and detachably mounted thereon and adapted to hold said machine gun in a position such that it can be actuated thereby and by a mechanism for actuating the trigger.

In the example illustrated, it has been assumed (Fig. 1) that the machine gun M is lodged upside down in a wing A of an aeroplane having two wing spars L^1, L^2. In this case, the supports of the recocking device are fixed on said wing spars. The recocking device comprises a long frame C the rear portion of which is fixed on a rod **106** connected at its rear end to a rear support plate **101**, while the front portion of said frame is fixed on a tube **167** connected at its front end to a front support plate **170**, said plates **101** and **170** being secured to the wing spars L^1 and L^2, respectively.

Referring to Figs. 2 and 5, the rear end of the rod **106** forms a ball **106**^{a} which engages a socket secured to a sliding plate **102** and is held in said socket by a sleeve **105** screwed thereon. Said plate can slide vertically on the support plate **101** secured to the rear wing spar. The position of said slide plate can be adjusted by a vertical elevating screw **103** screwed in an ear **103**^{2} on said plate and held from moving axially by ears **103**^{1} on the support plate **101**. The front end of the rod **106** (Fig. 2*a*) forms an abutment **106**^{1} for the rear end of the machine gun.

Referring to Figs. 2*a*, 5*a* and 6, the front end of the tube **167** is engaged in an eye **168**^{a} in a sliding bracket **168** which is mounted on a horizontal traversing screw **169**^{a}. The latter is screwed in a sleeve **168**^{c} on said bracket and is rotatably held by ears **170**^{1} on the support plate **170** secured to the front wing spar. Secured to or solid with said bracket and sleeve is a ring **168**^{b} in which the barrel of the machine gun is engaged.

Referring to Figs. 2*a* and 3, a collar **104** is fixed to the frame of the recocking device, by an angle piece **104**^{a}, for holding the breech part of the machine gun. Said collar has a fixed member **104**^{1} and straps **104**^{2} and **104**^{3} hinged thereto. A lever **104**^{4} is pivotally connected to the strap **104**^{3}, and on said lever is hinged an adjustable hook **104**^{6} which hooks onto the strap **104**^{2}. Said hook can be adjusted beforehand, in order that the machine gun may be clamped in the desired manner. The strap **104**^{3} carries furthermore a lock **104**^{5} for holding the lever **104**^{4} in the closed position. Said collar is used as follows: the hook **104**^{6} is hooked to the strap **104**^{2}, the lever **104**^{4} is turned down close to the strap **104**^{3} for tightening the collar on the machine gun and the lock **104**^{5} is turned through 90° for locking said lever in this position.

In this manner, the machine gun can be mounted onto and dismounted from the recocking device by hand, very readily. Its position relatively to the axis of the aeroplane can be adjusted by the elevating and traversing screws **103** and **169**^{a}, respectively.

Referring again to Fig. 1, the driving member R^1 of the recocking device R is adapted to engage the recocking knob B of the machine gun when said knob is in the front or uncocked position and to drive it to the rear position, shown in Fig. 1, for recocking the gun. A firing relay T is also secured on the frame C with its driving member T^1 engaging the trigger D. These engagements require no handling.

The frame of the recocking device is formed of two longitudinal angle members **110** and **111** forming a slide for the moveable members of said device and secured together by rear and front end cross pieces **112** and **147** respectively. The moveable members comprise a sliding member **117** having a finger **117**^{1} and a flap **117**^{2} and

urged forwards by a spring 115 compressed between said flap and the rear end piece 112. Said finger forms the driving member diagrammatically shown in R^1 in Fig. 1 and is adapted to drive rearwards the knob B, which is shown in its forward position in Fig. 5*a*.

Said moveable members further comprise a moveable cylinder 128, adapted to slide on a fixed piston 145, which is fixed in the front strut 147 by means of a screw thread and gasket 146. Pivoted on a pin 122 carried in the head 126 of said cylinder 128 is an arm 119 having a nose 119^1 adapted to engage a projection 117^3 on the sliding member 117 and to drive the latter rearwards. The frame members 110 and 111 provide guideways, as 111^1, 111^2 in 111. The ends of the pin 122 slide in the guideways 111^1. The arm 119 has, near its nose 119^1, projections 120 urged laterally outwards by a spring 121 (Fig. 4) and adapted to run rearwards in the guideways 111^2 and forwards in the guideways 111^1, said arm then being rocked clockwise from the position in Fig. 2*a*. To this end, said guideways communicate with each other by oblique slopes 111^3 at the rear end and 111^4 at the front end, said slopes causing said projections to be depressed and to spring out as soon as they are in the other guideways. A return spring 155 is connected between a pin 156 in the arm 119 and another pin 154 secured to the front strut 147 to bring again said arm and the cylinder 128 into their position of rest, shown in Fig. 2*a*, when they have recoiled for recocking the gun. A leaf spring 172 is interposed between the arm 119 and the head 126 and tends to rock said arm anti-clockwise in Fig. 2*a*. Another leaf spring 173 is provided on the rear strut 112, which spring is engaged by said arm at the end of a recoil stroke of same and causes it to rock clockwise (see Fig. 2).

The cylinder 128 provides in its head 126 a seat for an exhaust valve 124. Secured to said valve is a cup 123 which serves as a rest for the spring 125 of said valve and as a stop for a set screw 118 carried on the arm 119. When said arm returns forward with its projections 120 in the guideways 111^2 and thus rocks clockwise about the pin 122, said screw is adapted to depress said valve for exhausting the cylinder 128 to the atmosphere.

The fixed piston is hollow and thus has an inner chamber. Adapted to be slightly displaced in said chamber is a unit comprising a piston 136 with a cup leather 138 and a piston rod 135. Said rod carries at its other end an operating valve 135^1 bearing on a seat 133 in the end of the fixed piston 145 in front of the head 126 to close orifices 135^2, through which the chamber in said piston can communicate with the chamber in the cylinder 128. A spring 144 is provided between the inner piston 136 and the front strut 147 to press said piston into the fixed outer piston 145 and to close said operating valve. The inner piston 136 is also hollow and forms an outwardly open inlet chamber 145^1 so as to accommodate an inlet valve 140 having a spring 141.

Compressed air can be introduced into the inlet chamber 145^1 by a duct 147^5 in the front strut 147 and through the inlet valve 140 acting as a check valve, into the fixed piston 145, where it is stored until a recocking operation is required. Alternatively, said duct can be connected to the atmosphere which causes the inner piston 136 to be displaced forwards by the pressure in the fixed piston 145 and thus to open the operating valve 135^1, whereupon compressed air enters the cylinder 128 and causes same to recoil for recocking the machine gun.

Connection of said duct to compressed air or to the atmosphere is controlled, in the embodiment shown, by a delay mechanism. Said mechanism comprises a cylinder 157 located in the right hand part of the slide 110—111 and in which a piston valve is adapted to reciprocate, said valve having two spaced packing rings 160, 160^1 carried on the front end of a rod 160^2. The cylinder 157 has ports 157^1 communicating with the duct 147^5, other ports 157^2 communicating with a hollow plug 161 screwed in the strut 147 and to which the compressed air feed pipe 161^1 is connected, and a slot 157^3 opening to the atmosphere. Said ports and slot are so located that the rear packing ring 160 connects the ports 157^1 either with the slot 157^3 or with the ports 157^2 and thus connects the duct 147^5 either to the atmosphere or to the compressed air respectively, according to the valve being in its forward or its rear position (which latter is shown in Figs. 2*a* and 5*a*) respectively, while the front packing ring 160^1 forms a closure for the space which is fed through the ports 157^2 in any position of the valve. The arrangement is further such that said rear packing ring has to travel a distance forwards from its rear position to close the ports 157^1 and thus to cut off the admission of compressed air to the duct 147^5, and has further to travel to the foremost position to pass said ports to connect them to the atmosphere.

A coiled spring 159 located in the rear end of the cylinder 157 between a screwed cap 158 and a flange 160^3 on the rod 160^2 urges the valve 160—160^1 to the front position. A similar cap 158 screwed on the front end of the cylinder 157 has an opening 158^2 with a flap 158^1 adapted to entrap air before the front packing ring 160^1, and to form, together with said ring, an air brake or damper for the forward stroke of the piston valve.

Arranged to reciprocate on the side of the slide 111 adjacent to the path of the recocking knob B is a rod 164 having a nose 164^1 at its rear end and a fork 162 at its front end. The nose 164^1 is adapted to be engaged by said knob near the end of its recoil stroke and to be driven back a distance equal to the desired stroke of the piston valve. The fork 162 protrudes in the cylinder 157 through the slot 157^3 and engages the flange 160^3 to drive back the piston valve against the spring 159 as the knob drives the nose 164^1.

It will be understood that by the arrangement described, the piston valve 160—160^1 is positively driven to its rearmost position by each recoil of the recocking knob and is slowly returned forwards by the spring 159 with the damper 160^1, 158^1, so that when the gun is firing, said valve reciprocates between its rearmost position and a position a little before said rearmost position, the duct 147^5 remaining connected to the compressed air, and when the gun stops firing with the repetition mechanism released or uncocked and the recocking knob resting in its front position, said valve is allowed to return to its front position to finally connect said duct to the atmosphere, thereby to cause the piston 136 to open the valve 135^1 and thus to make the recocking cylinder 128 effect a recocking stroke.

However, a misfire can occur shortly after another, so that at this time the hollow piston 145 is not sufficiently filled with compressed air to enable the gun to be recocked; moreover, such

a misfire can occur while the cylinder 128 still effects its return stroke with the projections 120 on the rocking arm 119 engaged in the outer groove 111² of the slide 110—111, and the nose 119¹ of said cam disengaged from the sliding member 117. In such cases, the recocking would be missed and even no longer possible with the arrangement described, since compressed air would be no longer supplied to said hollow piston. In order to obviate such failures, locking devices are provided which prevent the piston valve 160—160¹ from returning forwards until the desirable pressure in the hollow piston is reached and until the cylinder 128 has returned to its position of rest. Said devices comprise pawls or catches 153—153¹ (Figs. 2a, 5a and 3) and 200 (Fig. 7) yieldingly engaged in the valve cylinder 157 and cooperating with a collar 160⁴ on the rod 160², the arrangement, which includes suitable bevels on said pawls and collar, being such that the slide valve 160—160¹ can move back but cannot return forwards to open ports 157¹ to the atmosphere until both of said pawls are retracted from the cylinder 157.

The pawl 153 is carried on a pivoting pin 152 (Figs. 2a and 3) with a spring 152¹ (Fig. 3), urging it into the valve cylinder. Secured to the same pin is a lever 149 which extends to the side of the recocking cylinder 128 and ends in a nose 149¹ adapted to be pushed forwards by the ring 134 on the front end of cylinder 128 when the latter is in the forward position, so that the pawl 153 is then, and only then, retracted from the valve cylinder. The pawl 200 (Fig. 7) is formed by a bell crank lever 201 actuated by the rod 202 of a bellows piston 203 arranged in a cylinder 203¹, which cylinder is connected to the duct 147⁵. The pressure acts on said bellows piston in the direction of the arrow f^{30}, to retract the pawl 200, and a spring 204 acts in the opposite direction, so that the pawl is only retracted when the pressure in the duct 147⁵ and therefore in the hollow piston 145 has reached the desired value.

The operation of the recocking mechanism is effected in the following manner: when the machine gun is cocked or is recoiling normally during firing, the recocking knob displaces the rod 164 of the delay mechanism in the direction of f^3; the fork 162 displaces the piston valve 160 so that the compressed air entering the valve cylinder 157 through the channels of the plug 161 is introduced into the duct 147⁵, and penetrates into the inlet chamber 145¹ of the fixed piston 145.

The air introduced into said chamber 145¹ raises the inlet valve 140 and fills the piston 145 until after a misfire and, by the operation of the delay mechanism 157, 160 etc., the inlet chamber 145¹ is placed in communication with the atmosphere through the ports 157¹ and the window 157³.

At the instant when the chamber 145¹ is placed in communication with the outer air, the displaceable unit, that is to say, the piston 136, is displaced in the direction of f^4 in the inner chamber of the fixed piston 145, compressing the spring 144, thereby moving the valve 135¹ away from its seat and permitting the charge of compressed air contained in the hollow piston 145 to expand violently in the displaceable cylinder 128, by passing through the orifices 135², and consequently to cause the displacement in the direction of f^1 of the displaceable cylinder 128 and of the members attached thereto.

In particular, the displaceable cylinder 128 drives the arm 119 in the direction of f^1; the nose 119¹ of the arm, which abuts against the sliding member 117, carries same with it, which in turn pushes with its finger 117¹ the recocking knob B of the machine gun.

In this movement in the direction of f^1, the projections 120 of the arm 119 slide first in the inner guideways 111¹, but at the end of this stroke, they are depressed by the slopes 111³, pass into the outer guideways 111² and spring out therein, the arm 119 being rocked owing to said slopes and to the spring 173 on the rear strut 112. Such rocking of said arm disengages its nose 119¹ from the projection 117³ on the sliding member 117, which then quickly returns forwards due to the spring 115. Said spring 173 damps the end of the recoil stroke of the cylinder 128 and accelerates its return movement. At the same instant, as said arm is rocked, the set screw 118 is brought into engagement with the cup 123, and the valve 124 is lifted from its seat for exhausting the cylinder 128.

The return spring 155, which is tensioned in the travel in the direction of f^1, brings back the arm 119 and the displaceable cylinder 128 in the opposite direction to f^1 into their initial position; during this return, the projections 120 slide in the outer guideway 111², whereas the pivot 122 of the cam slides in the inner guideway 111¹, so that the set screw 118 remains in engagement with the cup 123, the valve 124 consequently remaining constantly open.

At the end of the travel in the opposite direction to f^1, the projections 120 of the arm 119 pass from the outer guideway 111² into the inner guideway 111¹ by the slope 111⁴ and under the action of the spring 172 which rocks the arm 119 in the opposite direction to f^{21}; in this position the nose 119¹ of the arm 119 again engages the projection 117³ of the slide 117, whereas the exhaust valve 124, which is released from the action of the set screw 118, returns to its seat and closes the displaceable cylinder 128.

The machine gun being recocked, resumes firing if it had been accidentally stopped, if not, it suffices to operate the trigger D to start firing again.

The trigger can be operated by a pneumatic or other relay 181 (Fig. 3) diagrammatically shown in T, T¹ in Fig. 1, and with which this invention is not concerned.

The arrangement illustrated for the remote control of a machine gun also includes an emergency device for recocking the machine gun in case of failure of the pneumatic device. For this purpose, the tube 114, on which the turned-back flap 117² of a sliding member 117 is loosely engaged, is connected to the end of a flexible cable 116 passing over transmission pulleys 107¹, 107² and is adapted to slide in a tube 113 which is secured, at its rear end, in the rear strut 112.

Referring to Fig. 8, the free end of the cable 116 carries a handle 116¹ serving to actuate the cable 116 and to displace the sliding member in the direction of f^1. When the handle 116¹ is pulled, the cable 116, the sliding member 117 and the recocking knob of the machine gun are operated. A safety device against an accidental operation of the trigger is combined with the cable 116; said device comprises a nipple 116² secured to said cable 116; said nipple 116² slides within a sleeve 116³ and engages spring-pressed pawls 116⁴, 116⁵ which hold the cable and the members it controls in a safety position. The pawls

116⁴, 116⁵ can be disengaged from the nipple 116² by means of a ring 116⁶ sliding on the sleeve 116³, said ring having springs 116⁷ which cause the pawls 116⁴, 116⁵ to swing about their pins thereby disengaging the nipple for the pneumatic operation to start again.

I claim:

1. Pneumatic device for recocking a machine gun, comprising a frame, a cylinder adapted to slide in said frame, a fixed hollow piston in said cylinder, adapted to contain an operative charge of compressed fluid, an operating valve in said hollow piston opening into said cylinder and adapted when closed to prevent said charge from passing into the cylinder, means for feeding said hollow piston with compressed fluid, means for controlling said operating valve, means for returning said cylinder towards said hollow piston after a recoil stroke, means for connecting said frame to said gun so that said cylinder through its recoil stroke drives the machine gun recocking bolt to recock same, and means for securing the machine gun with the recocking device to a supporting structure.

2. Pneumatic device for recocking a machine gun, comprising a frame, a cylinder adapted to slide in said frame, a fixed hollow piston in said cylinder, adapted to contain an operative charge of compressed fluid, an operating valve in said hollow piston opening into said cylinder and adapted when closed to prevent said charge from passing into the cylinder, means for feeding said hollow piston with compressed fluid, a control piston adapted to actuate said operating valve, a chamber cooperating with said control piston, means for varying the pressure in said chamber to operate said control piston, means for returning said cylinder towards said hollow piston after a recoil stroke, means for connecting said frame to said gun so that said cylinder through its recoil stroke drives the machine gun recocking bolt to recock same, and means for securing the machine gun with the recocking device to a supporting structure.

3. Pneumatic device for recocking a machine gun, comprising a frame, a cylinder adapted to slide in said frame, a fixed hollow piston in said cylinder, adapted to contain an operative charge of compressed fluid, an operating valve in said hollow piston opening into said cylinder and adapted when closed to prevent said charge from passing into the cylinder, means for feeding said hollow piston with compressed fluid, a control piston adapted to actuate said operating valve, a chamber cooperating with said control piston, a distributor adapted to connect said chamber to the fluid pressure and to the atmosphere to operate said control piston, means for returning said cylinder towards said hollow piston after a recoil stroke, means for connecting said frame to said gun so that said cylinder through its recoil stroke drives the machine gun recocking bolt to recock same, and means for securing the machine gun with the recocking device to a supporting structure.

4. Pneumatic device for recocking a machine gun, comprising a frame, a cylinder adapted to slide in said frame, a fixed hollow piston in said cylinder, adapted to contain an operative charge of compressed fluid, an operating valve in said hollow piston, opening into said cylinder and adapted when closed to prevent said charge from passing into the cylinder, an inlet chamber, an inlet valve between same and said hollow piston, a distributor adapted to connect said chamber to the fluid pressure and to the atmosphere, a control piston cooperating with said chamber and adapted to open said operating valve upon said chamber being connected to the atmosphere, means for returning said cylinder towards said hollow piston after a recoil stroke, means for connecting said frame to said gun so that said cylinder through its recoil stroke drives the machine gun recocking bolt to recock same, and means for securing the machine gun with the recocking device to a supporting structure.

5. Pneumatic device for recocking a machine gun, comprising a frame, a cylinder adapted to slide in said frame, a fixed hollow piston in said cylinder, adapted to contain an operative charge of compressed fluid, an operating valve in said hollow piston opening into said cylinder and adapted when closed to prevent said charge from passing into the cylinder, a control piston forming a floating bottom for said hollow piston, said operating valve being located in the face of said hollow piston opposite to its bottom and being rigidly connected to said control piston, so as to be opened when said control piston moves away from said hollow piston face, an inlet chamber before said control piston, an inlet valve located in said control piston to let the fluid pressure pass from said inlet chamber into said hollow piston, a distributor adapted to connect said inlet chamber to the fluid pressure and to the atmosphere, means for returning said cylinder towards said hollow piston after a recoil stroke, means for connecting said frame to said gun so that said cylinder through its recoil stroke drives the machine gun recocking bolt to recock same, and means for securing the machine gun with the recocking device to a supporting structure.

6. Pneumatic device for recocking a machine gun, comprising a frame, a cylinder adapted to slide in said frame, a fixed hollow piston in said cylinder, adapted to contain an operative charge of compressed fluid, an operating valve in said hollow piston opening into said cylinder and adapted when closed to prevent said charge from passing into the cylinder, means for feeding said hollow piston with compressed fluid, a control piston adapted to actuate said operating valve, a chamber cooperating with said control piston, a distributor having a movable member and adapted to connect said chamber to the fluid pressure and to the atmosphere according to the position of said member, in order to operate said control piston, said movable member being adapted to be engaged and driven by the machine gun recocking bolt when the latter recoils to a set position in which it causes said distributor to operate said control piston to close said operating valve, yielding means for urging said member to a position of rest in which it causes said distributor to operate said control piston for opening said operating valve, means for delaying the movement of said member towards the position of rest whereby said member is slowly returned to this position when said recocking bolt rests in its forward position, means for returning said cylinder towards said hollow piston after a recoil stroke, means for connecting said frame to said gun so that said cylinder through its recoil stroke drives the machine gun recocking bolt to recock same, and means for securing the machine gun with the recocking device to a supporting device.

7. Pneumatic device for recocking a machine gun, comprising a frame, a cylinder adapted to slide in said frame, a fixed hollow piston in said

cylinder, adapted to contain an operative charge of compressed fluid, an operating valve in said hollow piston opening into said cylinder and adapted when closed to prevent said charge from passing into the cylinder, means for feeding said hollow piston with compressed fluid, a control piston adapted to actuate said operating valve, a chamber cooperating with said control piston, a slide valve adapted to connect said chamber to the fluid pressure and to the atmosphere to operate said control piston, so as to open said operating valve when said slide valve is in its rest position, a spring adapted to urge said slide valve towards its rest position, said slide valve being pushed to its set up position by the recoils of the machine gun recocking bolt, an air damper to delay the return of said valve to its rest position, means for returning said cylinder towards said hollow piston after a recoil stroke, means for connecting said frame to said gun so that said cylinder through its recoil stroke drives the machine gun recocking bolt to recock same, and means for securing the machine gun with the recocking device to a supporting structure.

8. Pneumatic device for recocking a machine gun, comprising a frame, a cylinder adapted to slide in said frame, a fixed hollow piston in said cylinder, adapted to contain an operative charge of compressed fluid, an operating valve in said hollow piston opening into said cylinder and adapted when closed to prevent said charge from passing into the cylinder, means for feeding said hollow piston with compressed fluid, means for controlling said operating valve, locking means adapted to prevent said operating valve from being opened unless said cylinder is in its rest position, means for returning said cylinder towards said hollow piston after a recoil stroke; means for connecting said frame to said gun so that said cylinder through its recoil stroke drives the machine gun recocking bolt to recock same, and means for securing the machine gun with the recocking device to a supporting structure.

9. Pneumatic device for recocking a machine gun, comprising a frame, a cylinder adapted to slide in said frame, a fixed hollow piston in said cylinder, adapted to contain an operative charge of compressed fluid, an operating valve in said hollow piston opening into said cylinder and adapted when closed to prevent said charge from passing into the cylinder, means for feeding said hollow piston with compressed fluid, means for controlling said operating valve, pneumatic locking means adapted to prevent said operating valve from being opened until the fluid in said hollow piston has reached a suitable pressure, means for returning said cylinder towards said hollow piston after a recoil stroke, means for connecting said frame to said gun so that said cylinder through its recoil stroke drives the machine gun recocking bolt to recock same, and means for securing the machine gun with the recocking device to a supporting device.

10. Pneumatic device for recocking a machine gun, comprising a frame, a cylinder adapted to slide in said frame, a fixed hollow piston in said cylinder, adapted to contain an operative charge of compressed fluid, an operating valve in said hollow piston opening into said cylinder and adapted when closed to prevent said charge from passing into the cylinder, means for feeding said hollow piston with compressed fluid, means for controlling said operating valve, means for returning said cylinder towards said hollow piston after a recoil stroke, an outlet valve in said cylinder, means for controlling said outlet valve so as to retain it open during the return stroke of the cylinder, means for connecting said frame to said gun so that said cylinder through its recoil stroke drives the machine gun recocking bolt to recock same, and means for securing the machine gun with the recocking device to a supporting structure.

11. Pneumatic device for recocking a machine gun, comprising a frame, a cylinder adapted to slide in said frame, a fixed hollow piston in said cylinder, adapted to contain an operative charge of compressed fluid, an operating valve in said hollow piston opening into said cylinder and adapted when closed to prevent said charge from passing into the cylinder, means for feeding said hollow piston with compressed fluid, means for controlling said operating valve, means for returning said cylinder towards said hollow piston after a recoil stroke, a sliding member in said frame, a driving connection between said cylinder and said sliding member and such that said cylinder drives said sliding member during its recoil stroke and that an escapement occurs at the end of said stroke, a spring to rapidly return said sliding member to its rest position after such escapement has occurred, means for connecting said frame to said gun so that said sliding member through its recoil stroke drives the machine gun recocking bolt to recock same, and means for securing the machine gun with the recocking device to a supporting structure.

12. Pneumatic device for recocking a machine gun, comprising a frame, a cylinder adapted to slide in said frame, a fixed hollow piston in said cylinder, adapted to contain an operative charge of compressed fluid, an operating valve in said hollow piston opening into said cylinder and adapted when closed to prevent said charge from passing into the cylinder, means for feeding said hollow piston with compressed fluid, means for controlling said operating valve, means for returning said cylinder towards said hollow piston after a recoil stroke, an outlet valve in said cylinder, a sliding member in said frame, a rocking arm on said cylinder, a finger on said arm adapted to open said outlet valve when said arm is in an outlet position, a cam on said arm adapted to engage said sliding member to drive same through the recoil of said cylinder when said arm is in a driving position, guide means in said frame to retain said arm in driving and outlet positions during the recoil and the return strokes of the cylinder, respectively, and to rock same at the ends of such strokes, means for connecting said frame to said gun so that said sliding member through its recoil stroke drives the machine gun recocking bolt to recock same, and means for securing the machine gun with the recocking device to a supporting structure.

13. Pneumatic device for recocking a machine gun, comprising a frame, a cylinder adapted to slide in said frame, a fixed hollow piston in said cylinder, adapted to contain an operative charge of compressed fluid, an operating valve in said hollow piston opening into said cylinder and adapted when closed to prevent said charge from passing into the cylinder, means for feeding said hollow piston with compressed fluid, means for controlling said operating valve, means for returning said cylinder towards said hollow piston after a recoil stroke, means for connecting said frame to said gun so that said cylinder through its recoil stroke drives the machine gun recocking bolt to recock same, a manually actuated me-

chanical transmission the end part of which is carried on said frame and is also adapted to recock the machine gun, and means for securing the machine gun with the recocking device to a supporting structure.

14. Pneumatic device for recocking a machine gun, comprising a frame, a cylinder adapted to slide in said frame, a fixed hollow piston in said cylinder, adapted to contain an operative charge of compressed fluid, an operating valve in said hollow piston opening into said cylinder and adapted when closed to prevent said charge from passing into the cylinder, means for feeding said hollow piston with compressed fluid, means for controlling said operating valve, means for returning said cylinder towards said hollow piston after a recoil stroke, a sliding member in said frame, a driving connection between said cylinder and said sliding member and such that said cylinder drives said sliding member during its recoil stroke and that an escapement occurs at the end of said stroke, a spring to rapidly return said sliding member to its rest position after such escapement has occurred, means for connecting said frame to said gun so that said sliding member through its recoil stroke drives the machine gun recocking bolt to recock same, a rod adapted to slide in said frame and to push said sliding member in the recoil direction to recock the machine gun, a manually actuated mechanical transmission the end part of which is formed by said rod, and means for securing the machine gun with the recocking device to a supporting structure.

15. Pneumatic device for recocking a machine gun, comprising a frame, a cylinder adapted to slide in said frame, a fixed hollow piston in said cylinder, adapted to contain an operative charge of compressed fluid, an operating valve in said hollow piston opening into said cylinder and adapted when closed to prevent said charge from passing into the cylinder, means for feeding said hollow piston with compressed fluid, means for controlling said operating valve, means for returning said cylinder towards said hollow piston after a recoil stroke, means for removably connecting said gun to said frame so that said cylinder through its recoil stroke drives the machine gun recocking bolt to recock same, and means for securing said frame to a supporting structure.

16. Pneumatic device for recocking a machine gun, comprising a frame, a cylinder adapted to slide in said frame, a fixed hollow piston in said cylinder, adapted to contain an operative charge of compressed fluid, an operating valve in said hollow piston opening into said cylinder and adapted when closed to prevent said charge from passing into the cylinder, means for feeding said hollow piston with compressed fluid, means for controlling said operating valve, means for returning said cylinder towards said hollow piston after a recoil stroke, a ring carried by said frame and adapted to engage the gun barrel, a manually operated securing collar also carried by said frame and adapted to engage the gun breech, said ring and collar being arranged so that said cylinder through its recoil stroke drives the machine gun recocking bolt to recock same, and means for securing said frame to a supporting structure.

17. Pneumatic device for recocking a machine gun, comprising a frame, a cylinder adapted to slide in said frame, a fixed hollow piston in said cylinder, adapted to contain an operative charge of compressed fluid, an operating valve in said hollow piston opening into said cylinder and adapted when closed to prevent said charge from passing into the cylinder, means for feeding said hollow piston with compressed fluid, means for controlling said operating valve, means for returning said cylinder towards said hollow piston after a recoil stroke, means for connecting said frame to said gun so that said cylinder through its recoil stroke drives the machine gun recocking bolt to recock same, and means for securing the machine gun with the recocking device to a supporting structure, the last said means being adjustable for elevation and for direction.

18. Pneumatic device for recocking a machine gun, comprising a frame, a cylinder adapted to slide in said frame, a fixed hollow piston in said cylinder, adapted to contain an operative charge of compressed fluid, an operating valve in said hollow piston opening into said cylinder and adapted when closed to prevent said charge from passing into the cylinder, means for feeding said hollow piston with compressed fluid, means for controlling said operating valve, means for returning said cylinder towards said hollow piston after a recoil stroke, means for connecting said frame to said gun so that said cylinder through its recoil stroke drives the machine gun recocking bolt to recock same, and means for securing said frame to a supporting structure at the front end and at the rear end of said frame, the last said means being adjustable for elevation at one of said ends and for direction at the other.

19. Pneumatic device for recocking a machine gun, comprising a frame, a cylinder adapted to slide in said frame, a fixed hollow piston in said cylinder, adapted to contain an operative charge of compressed fluid, an operating valve in said hollow piston opening into said cylinder and adapted when closed to prevent said charge from passing into the cylinder, a recoil stroke, means for feeding said hollow piston with fluid pressure, means for controlling said operating valve, means for returning said cylinder towards said hollow piston after a recoil stroke, means for connecting said frame to said gun so that said cylinder through its recoil stroke drives the machine gun recocking bolt to recock same, means for securing the machine gun with the recocking device to a supporting structure and the trigger-operating parts of a remote firing control carried on said frame and freely engaging the trigger of the machine gun.

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