

Dec. 13, 1938.

C. J. MICHAL, JR

2,139,691

MACHINE GUN

Filed Sept. 23, 1936

5 Sheets-Sheet 1

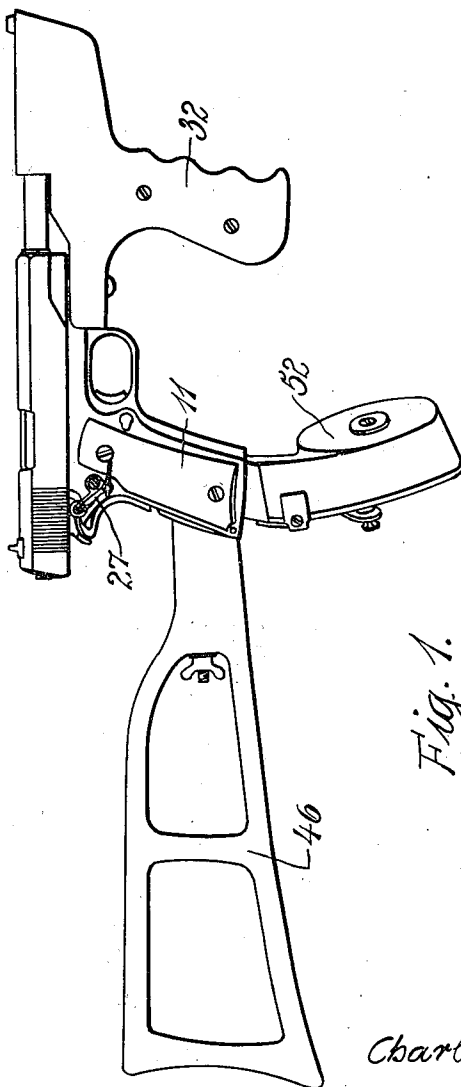


Fig. 1.

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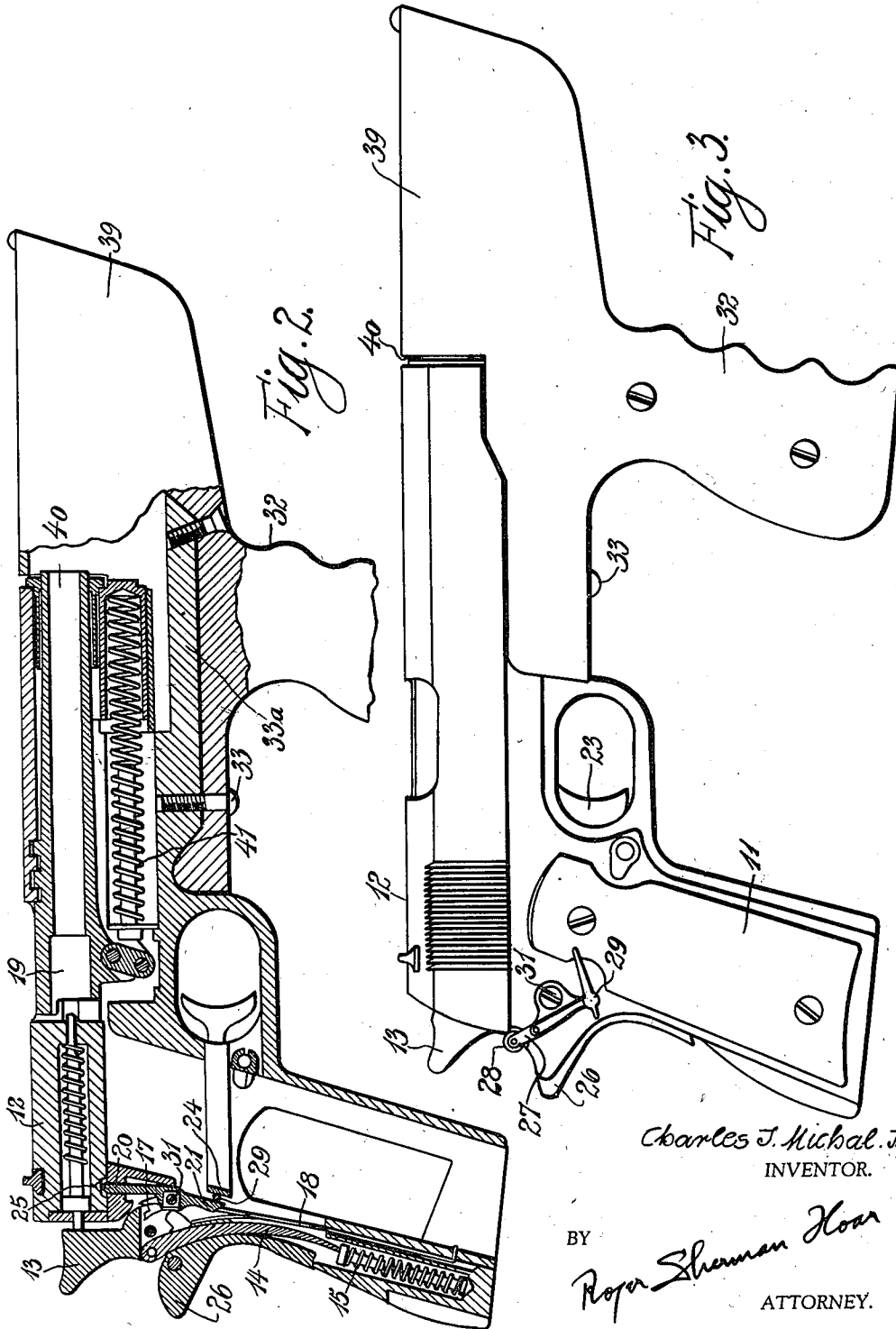
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5 Sheets-Sheet 2



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5 Sheets-Sheet 3

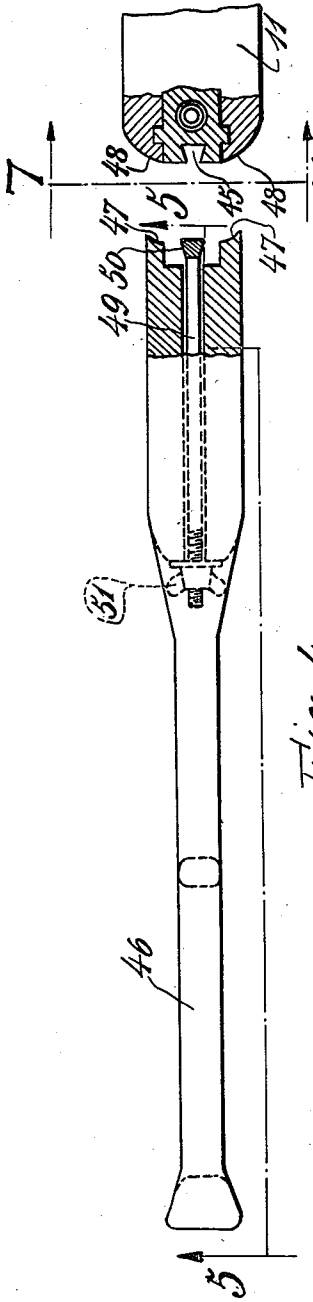


Fig. 4.

Fig. 6.

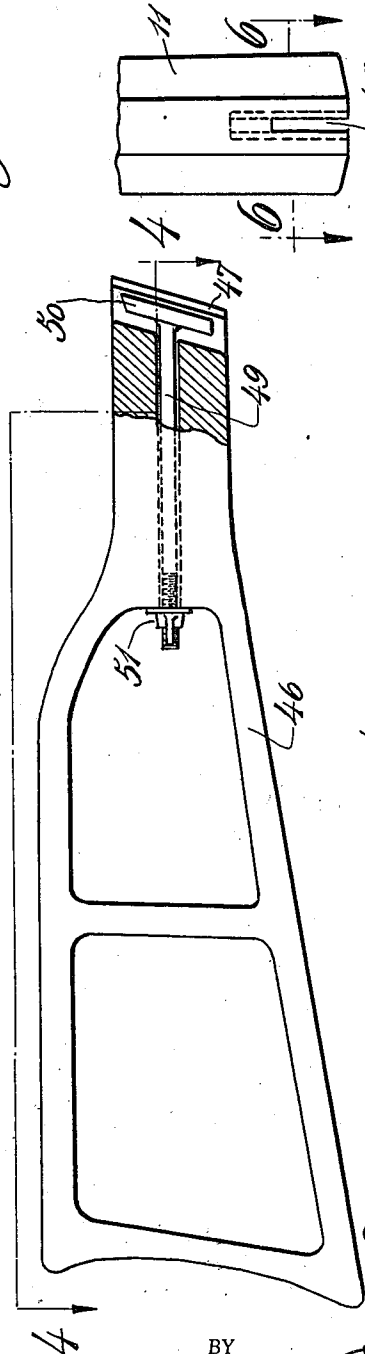


Fig. 5.

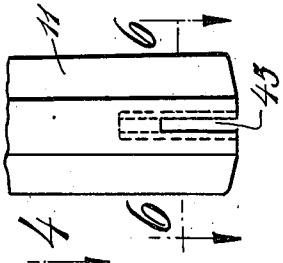


Fig. 7.

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MACHINE GUN

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5 Sheets-Sheet 4

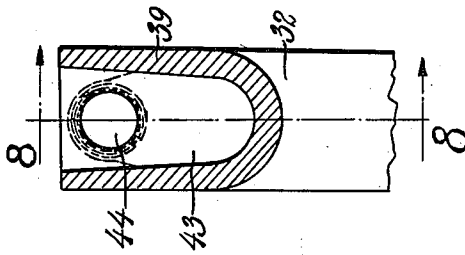


Fig. 9.

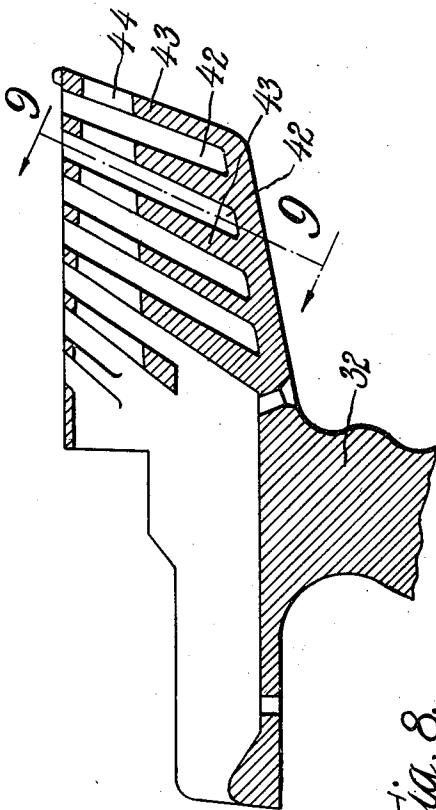


Fig. 8.

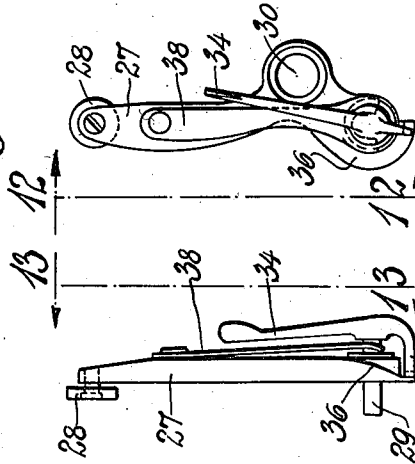


Fig. 12.

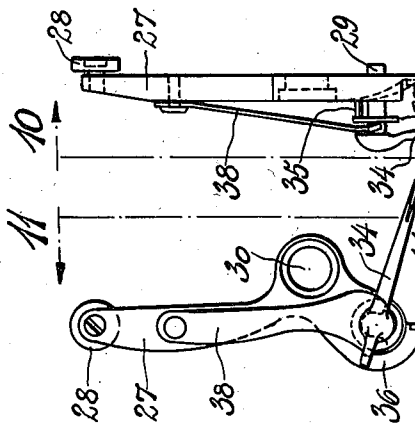


Fig. 10.

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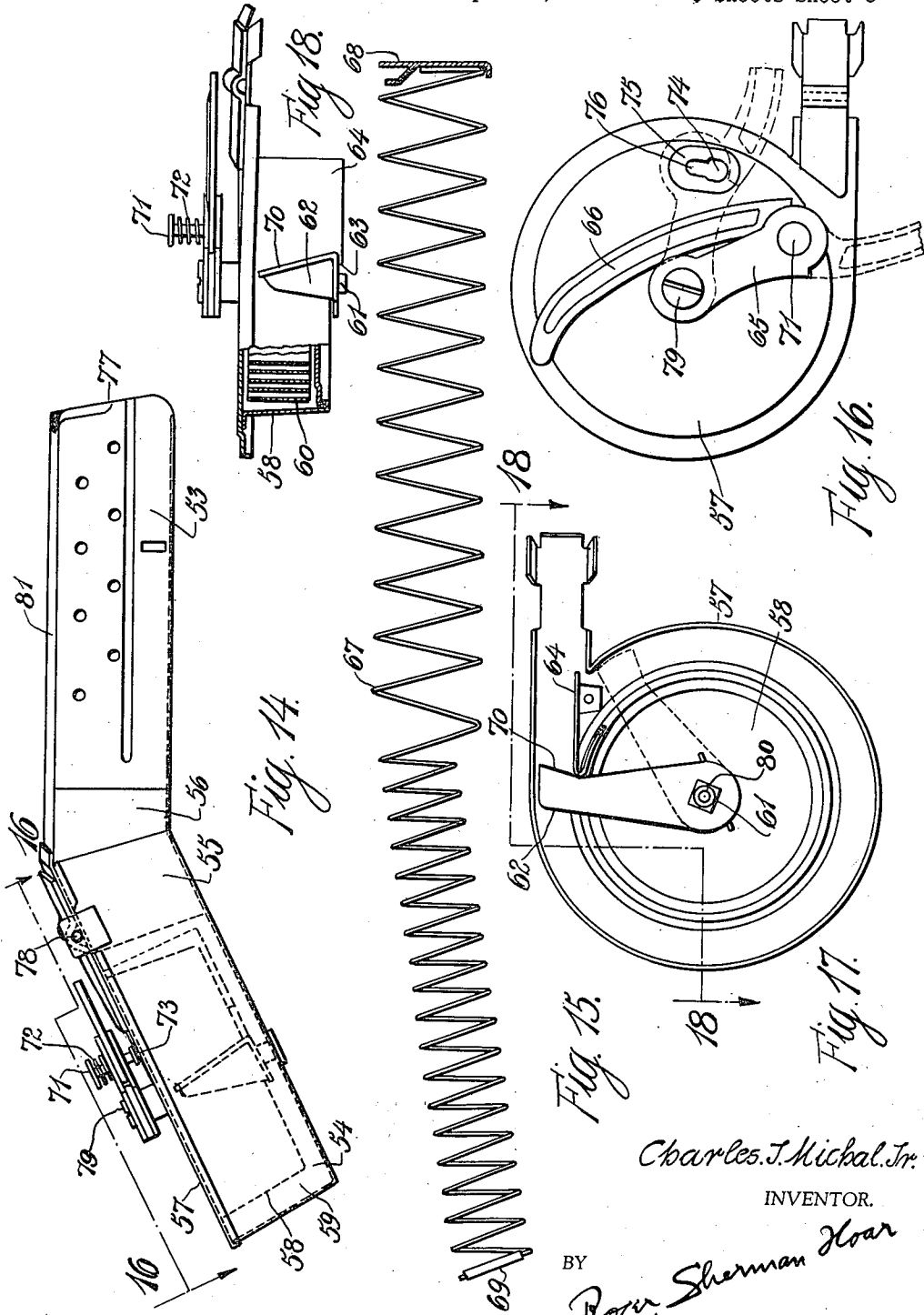
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2,139,691

MACHINE GUN

Filed Sept. 23, 1936

5 Sheets—Sheet 5



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2,139,691

MACHINE GUN

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Application September 23, 1936, Serial No. 102,100

9 Claims. (Cl. 42-69)

My invention relates to machine-guns and to devices for converting other fire-arms into machine-guns.

More specifically my invention consists in utilizing the motion of the recoiling parts of a fire-arm, acting against the natural resiliency of the trigger-finger of the person firing the arm, to automatically release the safety mechanism of the fire-arm, and to discharge the same in regular sequence.

Still more specifically my invention consists in so constructing my converter, that the converted fire-arm can be used at will as full automatic or semi-automatic.

Also it is my object to provide means for holding the fire-arm in a safe position during automatic firing, and to provide a magazine holding many rounds, so that the full automatic features of my converted fire-arm can be utilized to the utmost.

My present invention is an improvement on that described, shown and claimed in my copending application, Serial No. 713,479, filed March 1, 1934, which has matured into U. S. Patent No. 2,056,975, dated Oct. 13, 1936.

In addition to the foregoing objects, I have worked out a number of novel and useful details, which will be readily evident as the description progresses.

My invention consists in the novel parts, and in the combinations and arrangements thereof—and especially in the converter, the magazine and the stock thereof—which are defined in the appended claims; and of which one embodiment is exemplified in the accompanying drawings, which are hereinafter particularly described and explained.

Throughout the description, the same reference number is applied to the same member or to similar members.

Figure 1 is a side elevation of my complete invention, with the slide at recoil, and with the lever of the converter set for semi-automatic fire.

Figure 2 is a vertical longitudinal section of the fire-arm per se, with the slide in the forward position.

Figure 3 is a side elevation of the fire-arm as shown in Figure 2, with the lever set for semi-automatic fire as in Figure 1.

Figure 4 is a plan view, partly in section, of the shoulder piece of my weapon, taken along the line 4-4 of Figure 5.

Figure 5 is a side elevation, partly in section, of the shoulder piece of my weapon, taken along the line 5-5 of Figure 4.

Figure 6 is a horizontal partial section of the handle of the pistol, to which the shoulder piece as shown in Figure 4 is to be attached. It is taken along the lines 6-6 in Figure 7.

Figure 7 is a rear elevation of the handle of the pistol taken along the lines 7-7 of Figure 6.

Figure 8 is a vertical longitudinal section of the forward grip of my weapon, showing the blast deflectors. It is taken along the line 8-8 of Figure 9.

Figure 9 is an inclined cross-section of the blast-deflecting portion of my forward grip, taken along the line 9-9 of Figure 8.

Figure 10 is an enlarged side elevation of my improved converter, shown in place in Figures 1 and 3. It is taken along the line 10-10 of Figure 11, and is with the lever set for semi-automatic fire.

Figure 11 is an enlarged front elevation of my converter, with the lever set for semi-automatic fire, taken along the line 11-11 of Figure 10.

Figure 12 is an enlarged rear elevation of my converter, with the lever set for fully automatic fire, taken along the line 12-12 of Figure 13.

Figure 13 is an enlarged side elevation of my converter, with the lever set for fully automatic fire, taken along the line 13-13 of Figure 12.

Figure 14 is an enlarged side elevation of the magazine of my weapon, the viewpoint being at a slant slightly to the rear of the viewpoint of Figure 1.

Figure 15 is the follower-spring of my magazine, disassembled.

Figure 16 is a rear elevation of the cover of my magazine, taken along the line 16-16 of Figure 14.

Figure 17 is the view from the inside of the cover shown in Figure 16.

Figure 18 is a side view of this cover, taken along the line 18-18 of Figure 17, it is partly cut away to show the spiral spring inside.

Referring to the drawings, and more particularly to Figure 2, it will be seen that this figure illustrates the conventional Colt automatic pistol of the United States Army, with certain modifications which will become evident as the description progresses.

The Colt pistol, although officially called "automatic", is really merely semi-automatic, i. e. autoloading and cocking only.

The normal operation of such a pistol will now be briefly sketched. Reference may be made to the well-known operation of this fire-arm for further details.

A loaded magazine (not the improved magazine

shown in Figure 1) is placed in the handle 11. This magazine normally contains nine cartridges, impelled upward by a spring; but my invention contemplates elongating this magazine so as to contain 36 cartridges, for example, in the .38-caliber model.

The slide 12 is then drawn rearward (i. e., to the left in the figure) by hand. This action swings the hammer 13 counter-clockwise, depressing the hammer-strut 14 against compression of the mainspring 15. The notch 16 on the hammer, catches on the upper point of the sear 17, the sear being forced counter-clockwise into engagement by the action of one leaf of the sear-spring 18.

The slide 12 is then let forward, under the influence of counter-recoil spring 41, thus forcing a cartridge (not shown) into the chamber 19, in a manner well-known, and not constituting a part of my invention.

While the slide 12 was in its rearward position, the lower edge of the slide, by engaging the top of the disconnecter 20, forced it down so that its lower end 21 came below the lower end 22 of the sear 17. If, at such time, the trigger 23 had been pressed, the rear end 24 of the trigger slide would have pushed the lower end 21 of the disconnecter harmlessly below the lower end 22 of the sear, and the pistol would not have been discharged.

But, with the slide 12 in returned forward position, and the upper end 20 of the disconnecter consequently seated in the notch 25 on the lower side of the slide (the disconnecter being forced upward by the second leaf of the sear-spring 18), the lower end 21 of the disconnecter is now in sufficiently raised position to engage the lower end 22 of the sear if the trigger be pulled, and thus trip the point 17 of the sear out of the notch 16 of the hammer, thus permitting the hammer 13 to fall upon the firing-pin 26, and discharge the piece.

The forces of recoil throw the slide 12 rearwardly again, thus cocking the hammer 13 as before. And the counter-recoil puts another cartridge in the chamber 19.

But, although the trigger 23 still be held pressed, as the lower edge of the slide 12 forces down the head 20 of the disconnecter, so that the lower end 21 of the disconnecter is forced below the level of the lower end 22 of the sear, thus permitting the sear to rotate counter-clockwise to cock the piece, and preventing the continued pressure on the trigger from discharging the piece.

There is another safety device, involving the grip-safety 26, which is not involved in my invention, and hence will not be described, although its original operation is in no way impaired by the introduction of my invention.

If, after the slide has fully returned to its forward position, the trigger is released, the lower end 21 of the disconnecter will move forward and upward, under the influence of the sear-spring 18, until it again engages the front edge of the lower end 22 of the sear, ready to fire upon renewed pressure of the trigger.

I have added to the conventional Colt pistol the converter 27, shown in place in Figures 1 to 3 (and the improved form of which will be described a bit later herein). 28 is its roller, 29 its pin, and 31 the screw about which it pivots.

I cut a slot in the side of the handle of the pistol for the pin 29, and insert it so that it will engage the rear of the trigger-slide 24, as shown in Figure 2. Such is the width of the trigger-

slide 24 that the pin does not interfere with the disconnecter 21, although it appears to do so in the figure.

Its action is as follows. The trigger 23 fires the piece as before. But, the instant that recoil takes place, the lower edge of the slide 12 engages the roller 28 of the converter 27, thus rotating it counter-clockwise, and forcing the pin 29 forward. This motion of the pin forces the trigger forward against the pressure of the trigger-finger of the man, thus disengaging the trigger-slide 24 from the disconnecter 21, and permitting the disconnecter to return to firing-position the instant that counter-recoil is completed.

The pin 29 holds the trigger inoperative against the pressure of the trigger-finger. But, the instant that counter-recoil is completed, the roller 28 is free to move upward again, and consequently the pressure of the trigger-finger immediately again discharges the piece.

As a result, shots occur rhythmically with the cadence of recoil and counter-recoil of the piece.

The use of my converter has quite a different result from what would obtain if the disconnecter were omitted, and the trigger-slide were lengthened to bear directly against the sear. For, in that case, the sear would merely be held out of engagement with the notch on the hammer, and the hammer would return at counter-recoil, with a force which might or might not discharge the piece, and might discharge the piece before counter-recoil had been safely completed. Whereas, in my invention, the hammer is successively cocked and positively discharged; and the gun is "locked in battery" before the discharge of the cartridge. Thus my invention is in no sense an undoing of the function of the disconnecter, but rather is the adding of an entirely new function and of the mechanism for performing it.

But it is well-known that the Colt pistol recoils with each shot into a position in which the hand which holds it is close to the right side of the firer's head, and the pistol is pointing diagonally upward to the rear. If, by virtue of my invention as thus far described, the second shot were to occur when the piece was in this position, the result might be disastrous.

Accordingly I have added a second handle 32, secured to the piece by screws 33, fitting into a bar 33a welded to the conventional Colt frame. This handle is preferably made of aluminum.

My invention, as thus far described, is identical to the stage of progress described, shown and claimed in my copending patent above identified.

I shall now describe a further improvement in my converter 27. Turning to Figures 10 to 13, we see that pin 29 is provided with a lever 34, with a projection 35, which moves on camway 36, as the lever rotates the pin. Pin 29 is also provided with a collar 37, against which bears a leaf-spring 38, tending to force the pin 29 to the right in Figure 11, and to the left in Figure 12. Thus, when the lever 34 is in the position shown in Figures 10 and 11, pin 29 is withdrawn from engagement with trigger-slide 24, and the weapon operates as a conventional Colt semi-automatic pistol, just as though my converter had not been added to it. But, when the lever 34 is in the position shown in Figures 12 and 13, pin 29 is forced by spring 38 into engagement with trigger-slide 24, and the weapon operates as a fully automatic machine-gun as in my copending patent, above identified.

I shall now describe a further improvement in my auxiliary handle 32. It is now provided with a portion 39, which projects in front of the muzzle

40 of the gun. This portion internally is made up of alternate inclined cavities 42 and inclined vanes 43. The rear vane is about 45°, and the vanes gradually become more vertical as they approach the front. Each vane has a hole 44, in line with muzzle, larger at the rear, and growing gradually smaller toward the front, until the frontmost one is just a little larger than the bullet, to permit passage of the bullet without grazing.

When the powder-blast, following the bullet out of the muzzle 40, mushrooms out immediately upon leaving the muzzle, the vanes 43 deflect it upward. The prospectively smaller holes divide the muzzle blast fairly proportionally over all the vanes. The muzzle-blast, by pressing downwardly and forwardly on the vanes, to a large extent neutralizes both the upward and the rearward kick.

As thus far described, my invention, equipped with the conventional Colt 9-shot magazine, or with the slightly elongated 18-shot magazine referred to in my above identified copending patent, can be carried in a shoulder holster, can be drawn instantly, and can be used at will either to fire single shots, or to loose a machine-gun blast without material recoil to disturb a steady aim.

But, if it be desired to use my weapon for more prolonged machine-gun fire, two further improvements of mine become pertinent.

The first of these two further improvements is the detachable shoulder-piece shown in Figures 4 to 7. It is made detachable, so that my weapon can be carried in a shoulder holster and used as a pistol, when desired.

The bottom portion of the rear edge of the handle 11 is provided with an inwardly-spreading slot 45. The forward end of the shoulder piece 46 (preferably made in skeleton construction of aluminum) has two abutments 47 to engage the sides 48 of rear of the handle 11. The forward portion of shoulder piece 46 is bored to accommodate a bolt 49, which terminates in a wedge 50. The bolt has a thumb-nut 51.

To assemble the shoulder piece, slide the wedge 50 up into the slot 45, and then tighten the thumb-nut 51.

This arrangement of mine is preferable to other means for securing a shoulder-piece to a pistol, for it will not wobble.

The second of my two above mentioned further improvements is the magazine 52 shown in Figures 14 to 18.

Part 53 is identical to the conventional Colt magazine, but with the bottom removed. Parts 54 and 55 constitute the conventional Luger magazine, consisting of a truncated conical portion 54, and a tangential portion 55. I connect these two magazines together by the intermediate portion 56. The angle (substantially 20°) at which I set the Colt magazine to the Luger magazine constitutes an important feature of my invention; as will now be explained.

It is at this point in my invention that I depart from the conventional Luger construction. In the Luger, the part which corresponds to my part 53 is materially narrower than the length of the cartridges, which accordingly lie in echelon, nose up. Luger's follower is parallel to an element of his cone, and his portions 55 and 54 join his portion 53 at such an angle that the cartridges are presented to portion 53 at the slant above referred to.

This construction requires, when filling his

magazine, the insertion of the cartridges one by one, by means of a loading-tool, which is apt to get lost, and without which the owner of a Luger is helpless.

In a Colt, on the contrary, the cartridges lie with their bases very nearly parallel to the edge 81 of the portion 53, and hence may be loaded by hand through end 77, which process is much more speedy, and has no tool to lose.

Of course, I could have modified my portion 53 by inserting a false back along edge 81, and then have employed the Luger portions 54 and 55 unmodified. But this would have necessitated using the loading tool, which I was seeking to eliminate.

I determined the angle of attachment between my portions 55 and 53 as follows. Making a diagram of portions 53 and 56, I laid a cartridge in the proper position at end 77 of the diagram, and then laid other cartridges side by side upon the diagram until they reached the further end of portion 56. The angle between the base of the last cartridge, and the edge 81 of portion 53, was the angle employed by me for attaching portion 55. The reason why I could not simply employ the inclination of the base of the first cartridge, is due to a slight difference in width at point and base of the particular ammunition.

Furthermore, I found that, if a less angle were employed, the bullets would nose-down, upon emerging from end 77, and, instead of entering the chamber of the gun, would jam. Whereas, if a greater angle were employed, the magazine would not load by hand. These considerations determine the exact angle for use with any particular caliber of gun and type of ammunition. In the exemplification shown, it happens to be 22.5°.

The cover 57 of the Luger magazine has a truncated conical portion 58 which projects into the truncated conical portion 54 of the magazine, leaving between them a space 59 just wide enough to hold a row of cartridges. I have had to modify the depth of this cover, to fit American ammunition, but it remains functionally the same. Portion 58 contains a very powerful spiral spring 60. This spring is attached to shaft 61, and is initially set so as to hold follower 62 firmly against notch 63 in guide 64. Keyed to the opposite end of shaft 61, on the outside of cover 57, is lever 65. Pivoted on the outer end of lever 65 is a handle 66.

The spring 67, shown in Figure 15, is inserted with its wide end 68 in the Colt magazine 53, and its small end bearing against the face 70 of follower 62. This face is bent back by me at an angle from the conventional Luger position.

Without such bending, I found that even my careful calculation of the other angle, already discussed, would avail me nothing—the bullets would jam. The angle at which to set the follower should be substantial, practically equivalent to the other angle already discussed, or even slightly more. All this is empirical.

About twelve cartridges can be inserted in the Colt magazine in the ordinary way, until spring 67 is compressed to the utmost. To insert more cartridges, handle 66 is swung down to its extended position, shown in dotted lines at the bottom of Figure 16. It, and lever 65, are then rotated clockwise to the dotted position shown at the right in Figure 16. Plunger 71 (see Figures 14 and 18) is then depressed against its spring 72, until its foot 73, enters the wide portion 74 of the slot 75. Upon releasing the manual pres-

sure on handle 66, foot 73 catches in the narrow portion 76 of the slot.

Follower 62 is now in its fully retracted position, as shown dotted in Figure 17, and the rest of the cartridges can now be inserted by hand, at the end 77 of the magazine, against merely the light pressure of spring 67.

When the magazine has thus been charged, foot 73 is released from slot 75, and handle 66 is folded back into its normal position. The magazine is now ready for use.

It is to be understood that the cover 57 is not removed during this process, nor in fact ever except for repairs, it being secured in place by a single bolt through hole 78, and by screw 79 inserted in threaded hole 80.

All the features of my present invention contribute to a common end, namely the conversion of a Colt piston into a machine-gun. My improved converter enables this conversion to be accomplished at will, by the mere flip of a little lever 34. The optional substitution of my improved magazine enables me to use the weapon at will as a many-shot machine-gun, or as a few-shot pocket machine-gun. In either use, my combined auxiliary handle and blast-deflector is necessary to cut down the recoil and insure accurate aim. For regular machine-gun use, a shoulder-piece is necessary; but, for pocket use, would be in the way. Hence my removable shoulder-piece.

Having now described and illustrated one form of my invention, I wish it to be understood that my invention is not to be limited to the specific form or arrangement of parts hereinbefore described, except insofar as such limitations are specified in the appended claims.

I claim:

1. The combination with a semi-automatic fire-arm, in which the trigger must be released between successive shots; of means, actuated by the recoil of a recoiling part, said means consisting of a converter operatively connecting said recoiling part with the trigger, whereby to force the release of the trigger against the tension in the trigger-finger of the operator, and to permit this tension to pull the trigger upon the completion of counter-recoil; whereby the fire-arm is rendered fully automatic; and means to render the aforementioned means, while still attached to the pistol, inoperative at will.

2. In a machine-gun, having the conventional parts including stock, barrel, chamber, magazine, and means for ejecting exploded cartridges and for inserting new cartridges into the chamber, the combination of: a slide; a hammer, so proportioned and positioned that the rearward motion of the slide, under the influence of recoil, will cock the hammer; means to lock the hammer cocked; a trigger, so proportioned and positioned that, after being pulled to fire the gun, it must move forward before it will be in condition to fire again; means, under the influence of the recoil of the slide, to thus move the trigger forward against the pressure of the trigger-finger of the operator, but leave it held in operative position against the pressure of the trigger-finger of the operator; means, under the influence of the counter recoil of the slide, to free the trigger for firing, under the influence of continued pressure of the trigger-finger; and means to render the last-mentioned means, while still attached to the pistol, inoperative at will.

3. In a machine-gun, having the conventional parts including stock, barrel, chamber, magazine,

and means for ejecting exploded cartridges and for inserting new cartridges into the chamber, the combination of: a slide; a hammer, so proportioned and positioned that the rearward motion of the slide, under the influence of recoil, will cock the hammer; a sear, to lock the hammer cocked; a trigger; a disconnecter, so proportioned and positioned as to operatively connect the trigger to the sear when counter-recoil is completed, and to disconnect the trigger from the sear during recoil, and to maintain that disconnection until the trigger is moved forward; means, under the influence of the recoil of the slide, to thus move the trigger forward against the pressure of the trigger-finger of the operator, but leave it held in operative position against the pressure of the trigger-finger of the operator; means, under the influence of the counter-recoil of the slide, to free the trigger for firing, under the influence of continued pressure of the trigger-finger; and means to render the last-mentioned means, while still attached to the pistol, inoperative at will.

4. In a machine-gun, the combination of: a hammer; a sear; a trigger; a disconnecter, so proportioned and positioned as to operatively connect the trigger to the sear when counter-recoil is completed, and to disconnect the trigger from the sear during recoil, and to maintain that disconnection until the trigger is moved forward; a recoiling part to actuate the disconnecter; means, under the influence of the recoiling part, to move the trigger forward against the pressure of the trigger-finger of the operator, during recoil and hold it released until the completion of counter-recoil; and means to render the last-mentioned means, while still attached to the pistol, inoperative at will.

5. In an attachment for converting a conventional semiautomatic pistol into a machine-gun, the combination of: a plate; a pivot therefor; a projection from the upper portion of the plate, to engage the under edge of the slide of the pistol during recoil and counter-recoil, thereby forcing and holding the upper portion of the plate to the rear and its lower portion forward, and releasing and permitting the upper portion of the plate to move forward and its lower portion to move rearwardly upon the completion of counter-recoil; a projection from the lower portion of the plate, engaging the rear of the trigger of the pistol, thereby forcing and holding the trigger forward against the pressure of the trigger-finger of the person firing the pistol during recoil and counter-recoil, and releasing the trigger for firing under continued pressure of the trigger-finger upon the completion of counter-recoil; and means for withdrawing the second projection at will, while still attached to the pistol.

6. In an attachment for converting a conventional semi-automatic pistol into a machine-gun, the combination of: a pivoted element; a projection therefrom, for engaging a recoiling element of the pistol; a second projection from the pivoted element, for forcing the trigger of the pistol forward against the trigger-finger of the operator, whereby the trigger is moved into pre-firing position against the pressure of the trigger-finger of the operator and is held inoperative during recoil and counter-recoil, and is instantly released for firing under continued pressure of the trigger-finger of the operator, upon the completion of counter-recoil; and means for withdrawing the second projection at will, while still attached to the pistol.

7. In an attachment for converting a conventional semi-automatic pistol into a machine-gun, the combination of: a pivoted element; a projection therefrom, for engaging the slide of the pistol; a second projection from the pivoted element, for engaging the trigger of the pistol, whereby the trigger is moved into pre-firing position against the pressure of the trigger-finger of the operator and is held inoperative during recoil and counter-recoil, and is instantly released for firing under continued pressure of the trigger-finger of the operator, upon the completion of counter-recoil; and means for withdrawing the second projection at will, while still attached to the pistol.

8. In an attachment for converting a conventional semi-automatic pistol into a machine-gun, the combination of: an actuated element, actuated by a recoiling element of the pistol; an actuating element, engaging the trigger of the pistol, to shift the trigger in the release direction against the pressure of the trigger-finger of the operator during recoil, and hold it thus shifted until the completion of counter-recoil, and there-

upon to free the trigger for action under the pressure of the trigger-finger of the operator; an operative connection between the actuated element and the actuating element; and means for optionally breaking the chain of this operative connection, while leaving the attachment still attached to the pistol.

9. In an attachment for converting a conventional semi-automatic pistol into a machine-gun, the combination of: an actuated element, actuated by a recoiling element of the pistol; an actuating element, engaging the trigger of the pistol, to shift the trigger in the release direction against the pressure of the trigger-finger of the operator during recoil, and hold it thus shifted until the completion of counter-recoil, and thereupon to free the trigger for action under the pressure of the trigger-finger of the operator; an operative connection between the actuated element and the actuating element; and means for withdrawing the actuating element from engagement with the trigger, while leaving the attachment still attached to the pistol.

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