

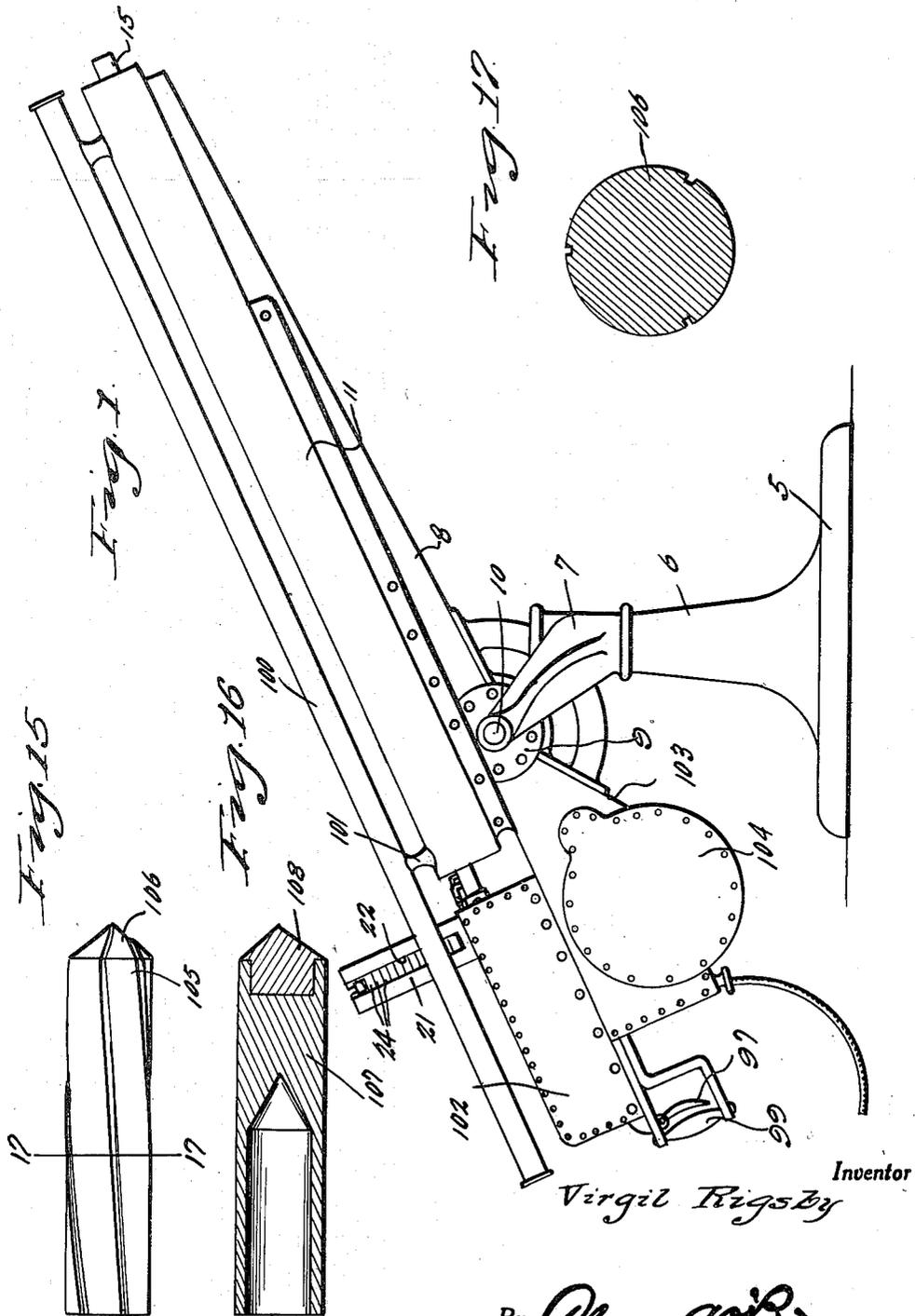
May 22, 1934.

V. RIGSBY  
MACHINE GUN

1,959,737

Filed March 2, 1933

6 Sheets-Sheet 1



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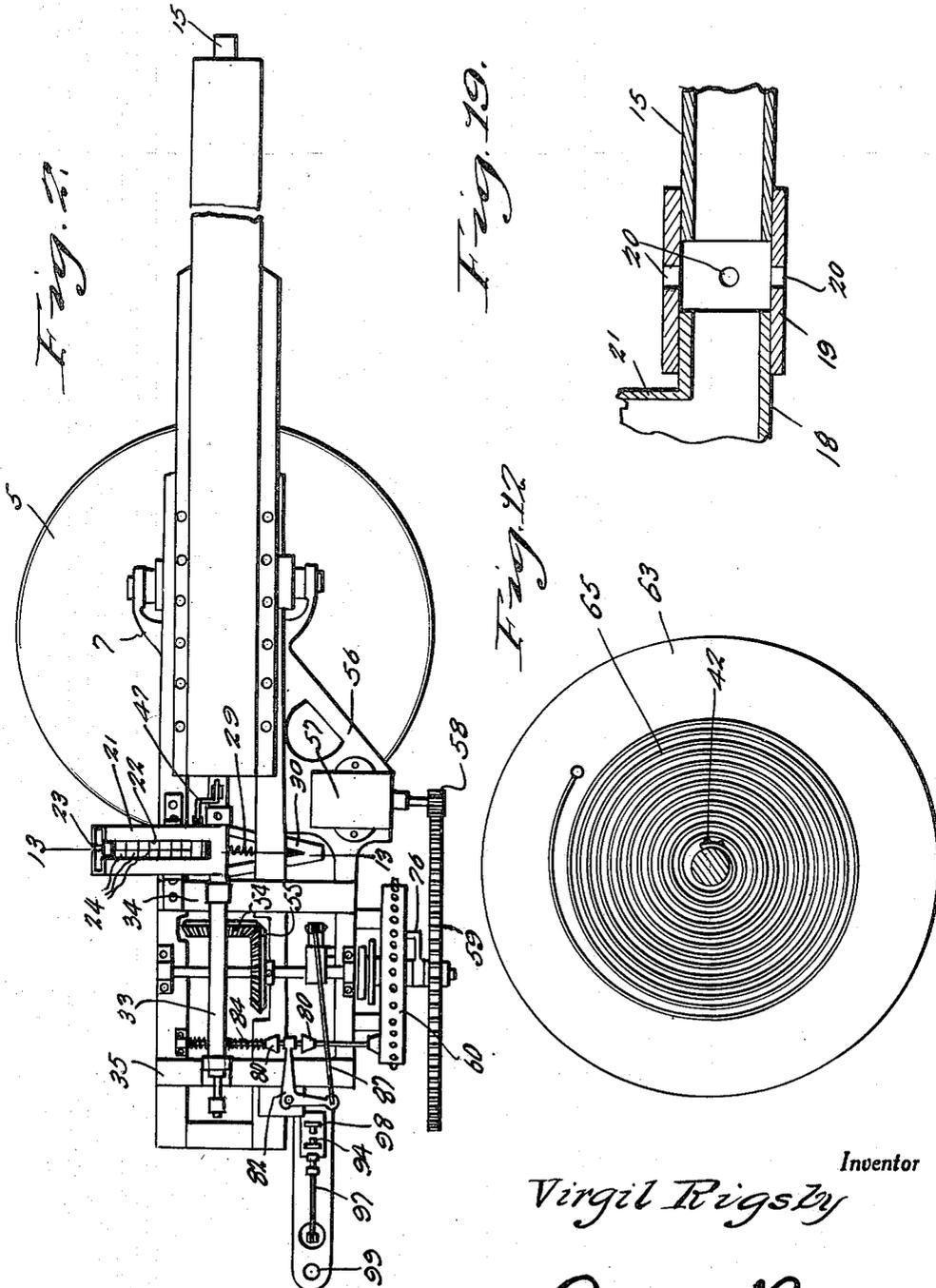
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6 Sheets-Sheet 2



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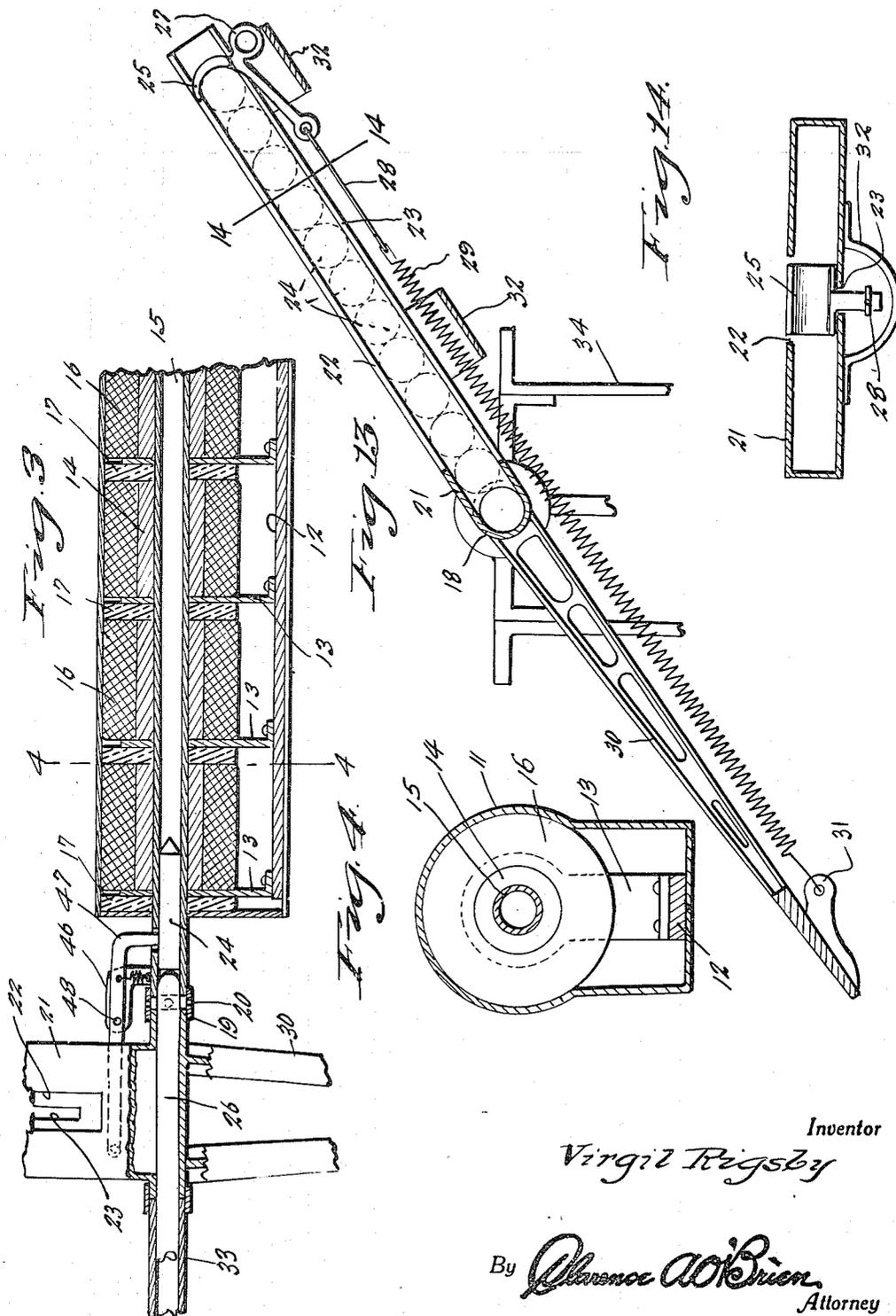
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6 Sheets-Sheet 3



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6 Sheets-Sheet 4

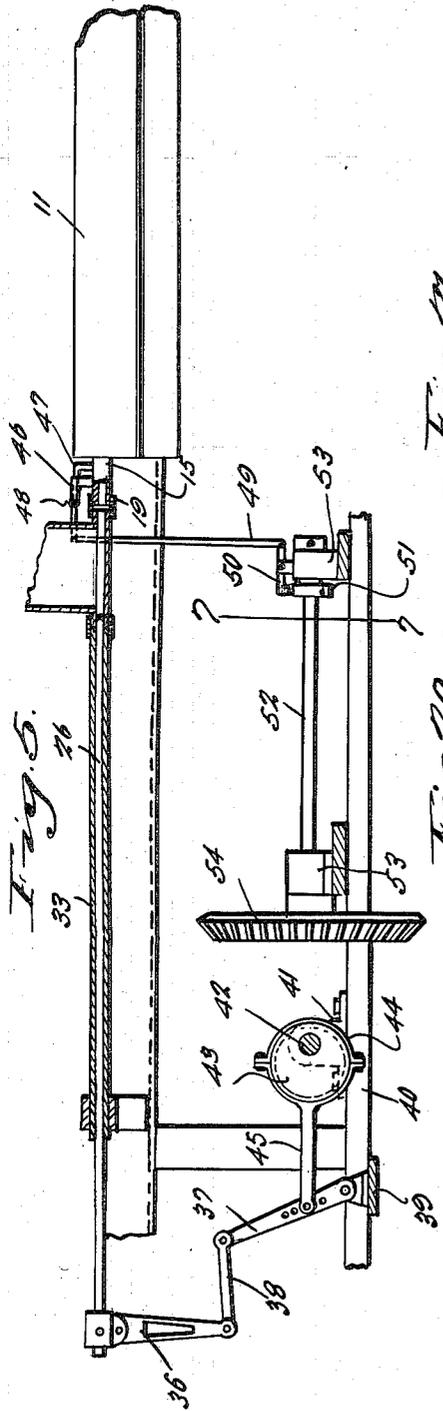


Fig. 7.

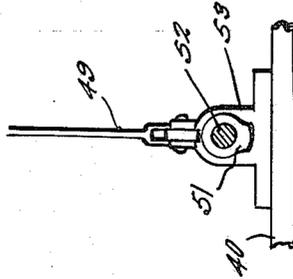


Fig. 20.

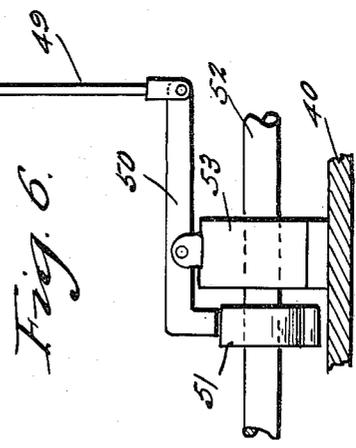
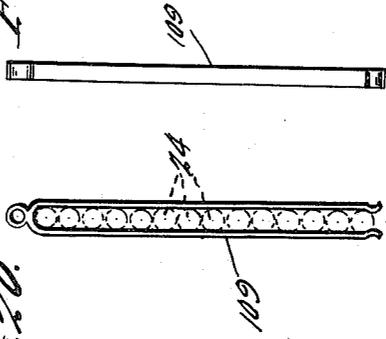


Fig. 6.

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Fig. 8.

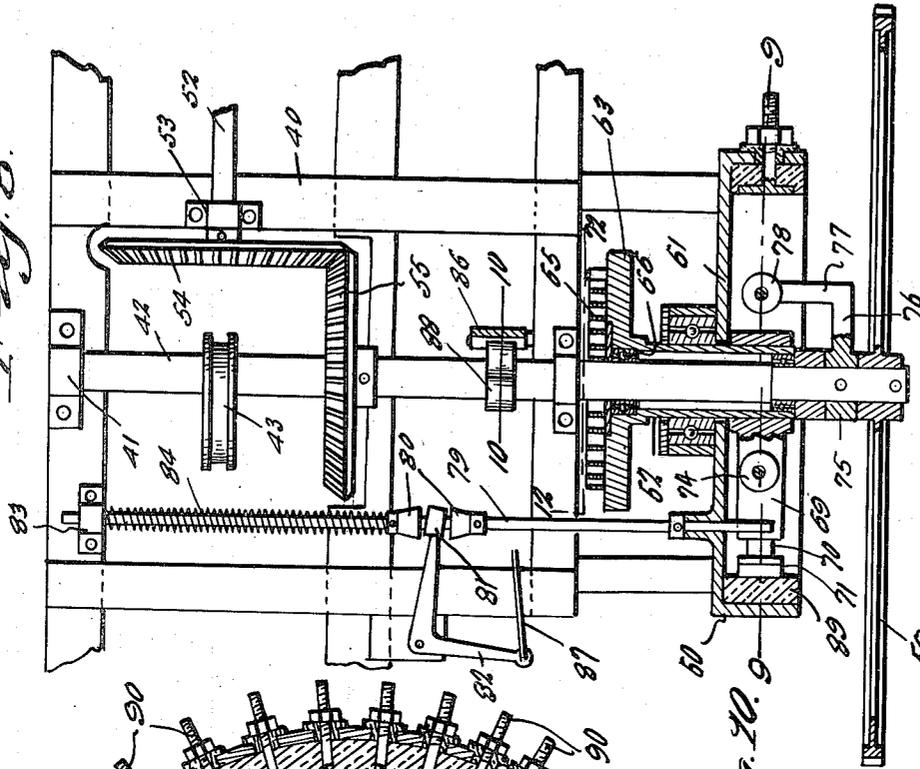


Fig. 10.

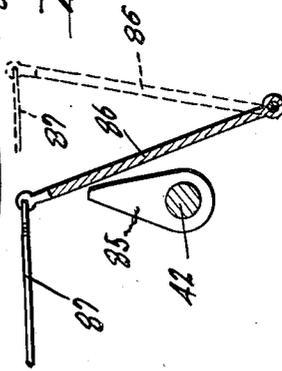
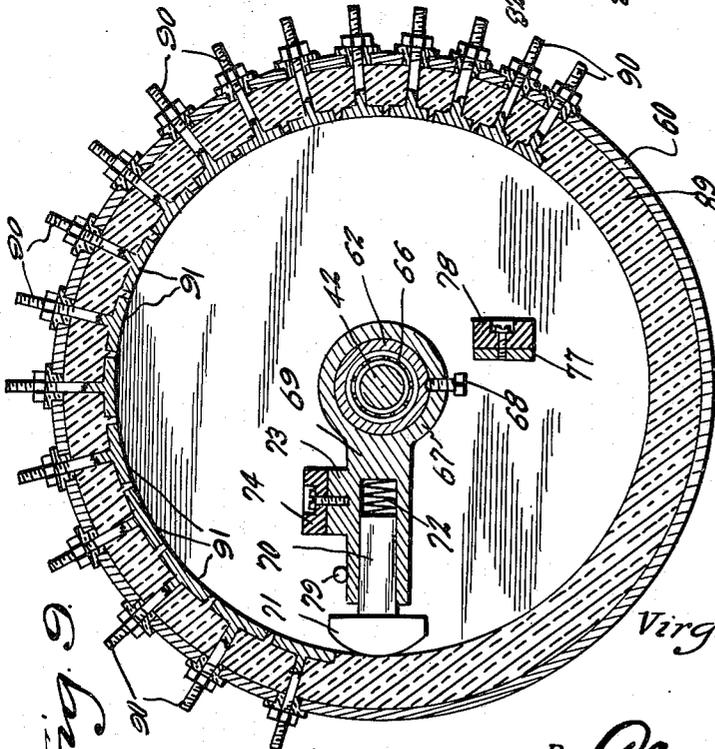


Fig. 9.



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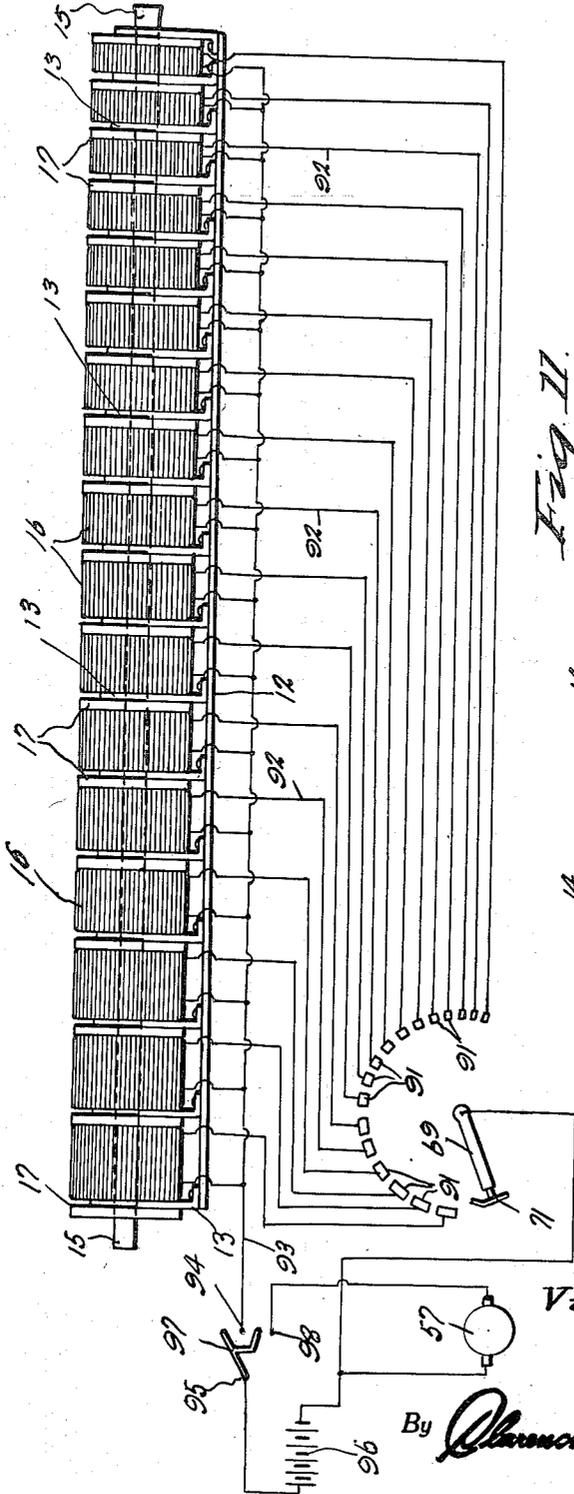
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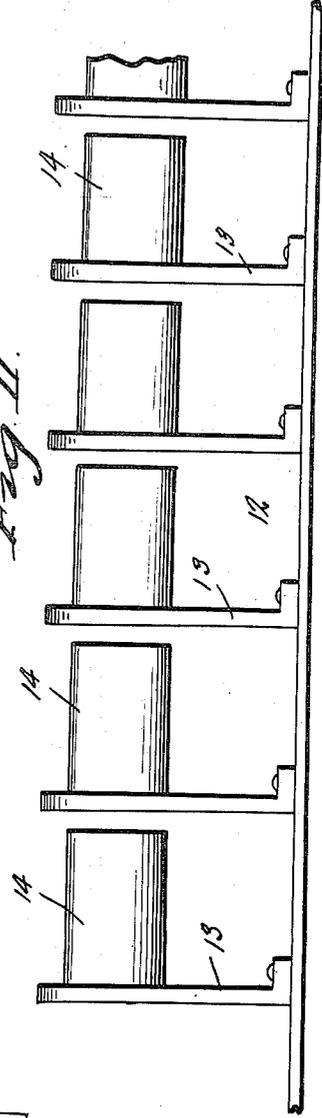
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*Fig. 18.*



*Fig. 11.*



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# UNITED STATES PATENT OFFICE

1,959,737

## MACHINE GUN

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Application March 2, 1933, Serial No. 659,417

4 Claims. (Cl. 172—285)

This invention appertains to new and useful improvements in ordnance and more particularly to a machine gun.

The principal object of the present invention is to provide a machine gun, wherein instead of the use of bullets projected by the explosion of gun powder or the like, magnetic flux is utilized.

Another important object of the invention is to provide a machine gun electrically operated and provided with means for distributing electricity to the electrical features thereof in a positive and foolproof manner.

These and various other important objects and advantages of the invention will become apparent to the reader of the following specification.

In the drawings:

Figure 1 represents a side elevational view of the gun in its entirety.

Figure 2 represents a top plan view of the gun, as shown in Figure 1.

Figure 3 represents a fragmentary detailed sectional view through the rear end portion of the magnet bank.

Figure 4 represents a cross sectional view taken substantially on the line 4—4 of Figure 3.

Figure 5 represents a fragmentary vertical sectional view disclosing the means for retaining the bullets in position with respect to the magnet bank and further showing the feed means for the bullet.

Figure 6 represents an enlarged detailed sectional view disclosing the cam means for operating the bullet receding means.

Figure 7 represents a cross sectional view taken substantially on line 7—7 of Figure 5.

Figure 8 represents a horizontal sectional view through the commutator and other features of the mechanism.

Figure 9 represents a vertical sectional view through the commutator taken substantially on line 9—9 of Figure 8.

Figure 10 represents a sectional view taken substantially on line 10—10 of Figure 8 with parts shown that are cut off in the sectional view 8.

Figure 11 represents the rack in side elevation for the magnet of the barrel.

Figure 12 represents a sectional view taken substantially on line 12—12 of Figure 8.

Figure 13 represents a vertical sectional view taken substantially on line 13—13 of Figure 2.

Figure 14 represents a cross sectional view taken substantially on line 14—14 of Figure 13.

Figure 15 represents a side elevational view of one of the projectiles.

Figure 16 represents a longitudinal sectional

view through a projectile having a cavity for an explosive.

Figure 17 represents a cross sectional view taken substantially on the line 17—17 of Figure 15.

Figure 18 represents a diagrammatic view disclosing the electrical connection between the electrical devices employed.

Figure 19 represents a fragmentary longitudinal sectional view at the inlet portion of the barrel.

Figure 20 represents an elevational view of the projectile clip.

Figure 21 represents a side elevational view of the clip shown in Figure 20.

Referring to the drawings wherein like numerals designate like parts, it can be seen in Figure 1, that the gun includes the base 5 having the standard 6 supporting the yoke 7. Numeral 8 represents the sub-casing having the bearings 9 on opposite sides thereof to receive the pin 10 which also extends through the bearing ends of the yoke 7, thus swingably supporting the gun. Numeral 11 represents the casing proper suitably secured to the casing 8 and extending longitudinally within this casing 11 is the bar 12. Obtaining from this bar 12 are the posts 13 each provided with a tubular core member 14. These core members 14 gradually decrease in length successively from the butt end of the barrel to the muzzle. As is apparent in Figure 3, the barrel 15 extending through the aligned core members 14, while wrapped around these core members are the magnetic coils 16, each coil being insulated from its adjacent coil by a dielectric spacing plate 17. The foregoing describes the magnet bank through which the barrel 15 extends.

The rear end of the barrel 15 is connected to the magazine tube 18 aligned therewith by the coupling sleeve 19. This sleeve 19 is provided with air inlet openings 20 and obviously these serve to prevent the increase of vacuum behind the projectile as it is discharged from the barrel 15.

Extending upwardly and at an inclined angle from the tube 18 is the magazine 21, the same being provided with a relatively wide slot 22 in the top thereof and a smaller slot 23 in the bottom thereof. Numeral 24 represents the projectiles which are stacked in the magazine, with the uppermost projectile engaged by the hook member 25, while of course the lowermost projectile is riding against the plunger rod 26 of the feed mechanism (see Figure 3). This hook 25 has a finger engageable arm member 27 thereof and a shank also provided with an arm with which is engaged

the connector 28, establishing connection between one end of the coil spring 29 and the hook 25.

Numeral 30 represents an elongated frame extending downwardly from the magazine and substantially aligned therewith, the same being provided with a lug 31 to which the lower end of the spring 29 is secured. Thus sufficient range for the spring is afforded. The spring is guarded by the guide 32 secured to the bottom of the magazine 21 and as is apparent in Figures 2 and 13, the magazine and the plunger rod tube 33 extending therefrom are supported by vertical frames 34 and 35.

As is clearly shown in Figure 5, the elongated feed rod 26 at its rear end has secured thereto, a depending leg 36, the lower end of which is connected to the lever 37 by the pivotal link 38. This lever 37 is rockably supported on a cross member 39 of the base frame 40. On this base frame 40 are bearings 41 rotatably supporting the shaft 42 which carries the cam 43, the cam being provided with a rider ring 44 having an arm 45 projecting therefrom and connected to the intermediate portion of the aforementioned lever 37.

Referring again to Figure 5, it can be seen that numeral 46 represents the bracket on the rear end portion of the barrel 15, and this supports a dog 47. This dog is rockable having its fulcrum at 48 and is connected to the elongated rod 49, the latter being secured to the rockable cam rider 50. This rider 50 is operated by the cam 51 on the shaft 52, this shaft being journaled through a bearing 53—53 on the base frame 40, and equipped with a bevel gear 54.

On the shaft 42 is located a beveled gear 55 which meshes with the aforementioned bevel gear 54.

Referring to Figure 2, it can be seen that numeral 56 represents a lateral support upon which is mounted the electric motor 57 having a driving pinion 58 meshing with the gear 59.

As is clearly shown in Figure 8, this gear 59 is keyed to the aforementioned shaft 42.

Suitably supported by the aforementioned frame 40 is the cylindrical shell 60 having a back wall 61 provided with an opening therein through which the sleeve 62 is rotatably disposed. The inner end of this sleeve 62 is provided with a disk 63. A coiled leaf spring 65 has one end secured to the shaft 42, while the opposite end is secured to the peripheral portion of the disk 63. The opposite end of the sleeve 62 has an internal bearing 66 against the shaft 42. The portion of the sleeve 62 projecting into the shell 60 has a collar 67 secured as at 68 thereto and from this extends the tubular arm 69 in which the shank 70 of the contactor 71 is slidable and normally projected outwardly due to action of the coiled spring 72 which is located within the arm 69. This arm has a boss 73 on one side thereof and of course carries a resilient bumper 74.

Between the hub of the gear 59 and the adjacent end of the sleeve 62 is a collar 75 from which extends the arm 76. This arm has a lateral portion at 77 which carries a resilient bumper 78 engaging with the bumper 74.

Numeral 79 represents an elongated rod provided with a pair of stop members 80—80 on the intermediate portion thereof between which the yoke 81 of the bell crank 82 is operative. One end portion of the rod 79 is slidable through the guide 83 and between this guide and the adjacent member 80 is the compressible coiled spring 84 which normally serves to maintain the rod urged in the direction of the arrows so that its opposite end

portion will be in the path of the tubular arm 69 of Figure 9.

This last mentioned rod 79 extends through a bore in the shell 60 to the position clearly shown in Figure 2.

Numeral 85 represents a cam on the shaft 42 ridable against the swingable plate 86, this plate having its outer end connected to one end of the rod 87, the opposite end of the rod being connected to the remaining end of the bell crank 82.

As can be seen in Figure 9, the interior of the shell 60 has a dielectric lining 89 and through this lining is disposed the binding post 90 of a plurality of contacts 91 located on the inner side of the lining 89. The contact surfaces of the contacts 91 vary in length to meet the requirement of more magnetic force at the start of the projectile than after it has gained momentum. From the outer ends of these binding posts extend the wires 92, to the coils 16 of the magnetic bank shown in Figure 18, the remaining sides of the coils being connected by the common return wire 93 to the contact 34 at the switch generally referred to by numeral 95. Numeral 96 represents a battery, one side of which is connected to the contactor 97 at the switch 95 while the opposite side is connected to the tubular arm 69 aforementioned. The aforementioned motor 57 is interposed between the last named battery 96 and the contact 98 of the switch 95.

Associated with said contact 97 shown in Figure 1 is the hand grip 99.

Numeral 101 represents a sight tube suitably secured as at 101 to the top of the casing 11. The feed mechanism is enclosed by a housing 102 (see Figure 1), while the mechanism disclosed in Figure 8 is enclosed in a housing 103 being provided with one or more movable plates 104.

Figure 15 discloses a projectile 105 which can be solid and provided with a pointed end 106. In place of having the interior of the barrel 15 grooved, the bullet can be grooved to secure the same action of the bullet.

Figure 16 discloses a hollow bullet 107 provided with a soft edge 108 and obviously this bullet may be filled with explosive and used as a shrapnel shell.

Figure 20 discloses a U-shaped spring clip 109 which can be used for containing a plurality of projectiles 24. Obviously by sliding this over the magazine with the legs of the clip riding in the grooves 22 and 23 a plurality of projectiles can be easily dislodged into the magazine at one operation.

Obviously, when the switch 95 is closed by operating the contact 97 (see Figures 1 and 18), the motor 57 is operated. This operation of the motor causes the arm 76 (see Figure 8) to swing the arm 69 in a counter clockwise direction (see Figure 9) and as the contactor 71 reaches a position below the lowermost contact on the left, the cam 85 on the shaft 46 releases the plate 86 and permits the spring 84 on the rod 79 to project the rod toward the contactors 71 so that the rod will cross the return path of the contactor 69. During this operation, the cam 43 (see Figures 5 and 8) has actuated the arm 45 and through the lever 37, link 38 and arm 36 has moved the rod 26 in a backward and forward direction, thus releasing a projectile into the tube 13 and drives the same forward to a position under the dog 47. Simultaneous operation of the gear 54, actuating the cam 51 has swung the dog downwardly so that the projectile is retained against gravitation. This

retention need not be so very strong, just enough to overcome the tendency of gravity.

As the shaft 42 continues the operation, the cam 85 again strikes the plate 86, exerting a pull on the connecting rod 87. This causes a reverse motion of the rod 79 and as the spring 65 has been wound by the operation of a shaft to this point, releasing of the rod 79 from the contactor 69 will permit the spring 65 to turn itself and in so doing the sleeve 62 will carry with it the contactor 71 on the arm 69, the same riding across the contacts 91, successfully completing electrical circuit with the magnets of the bank as shown in Figure 18. Thus the projectile is driven by magnetic force through the barrel 15.

While the foregoing specification sets forth the invention in specific terms, it is to be understood that numerous changes in the shape, size and materials may be resorted to without departing from the spirit and scope of the invention as claimed hereinafter.

Having thus described my invention, what I claim as new is:

1. A gun of the character described comprising a barrel, a bank of electro-magnet extending along the barrel and means for energizing the magnet successively from the butt end of the barrel to the muzzle end, the magnets at the butt end of the barrel being substantially stronger than those adjacent the muzzle end.

2. A gun of the character described comprising

a barrel, a bank of electro-magnets extending along the barrel and means for energizing the magnet successively from the butt end of the barrel to the muzzle end, the magnets at the butt end of the barrel being substantially stronger than those adjacent the muzzle end, and means for automatically feeding projectiles to the said barrel, said means comprising a magazine at the butt end of the barrel, and an intermittently operated plunger operative under the magazine for feeding the projectile into the barrel.

3. A gun of the character described comprising a barrel, a bank of electro-magnet extending along the barrel and means for energizing the magnet successively from the butt end of the barrel to the muzzle end, the magnets at the butt end of the barrel being substantially stronger than those adjacent the muzzle end, means for feeding the said barrel, said means for feeding the barrel and energizing the magnet successively controlled cooperatively.

4. A magnetic gun comprising a barrel provided with a bank of magnets thereon, a commutator for energizing the magnets successively, means for feeding projectiles to the barrel, means for retaining the projectiles in the barrel preparatory to action thereon by the magnet, and a single electric motor for operating all of the said means simultaneously.

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