(No Model.)

C. H. PALMER.

MACHINE GUN.

No. 332,741. Patented Dec. 22, 1885.

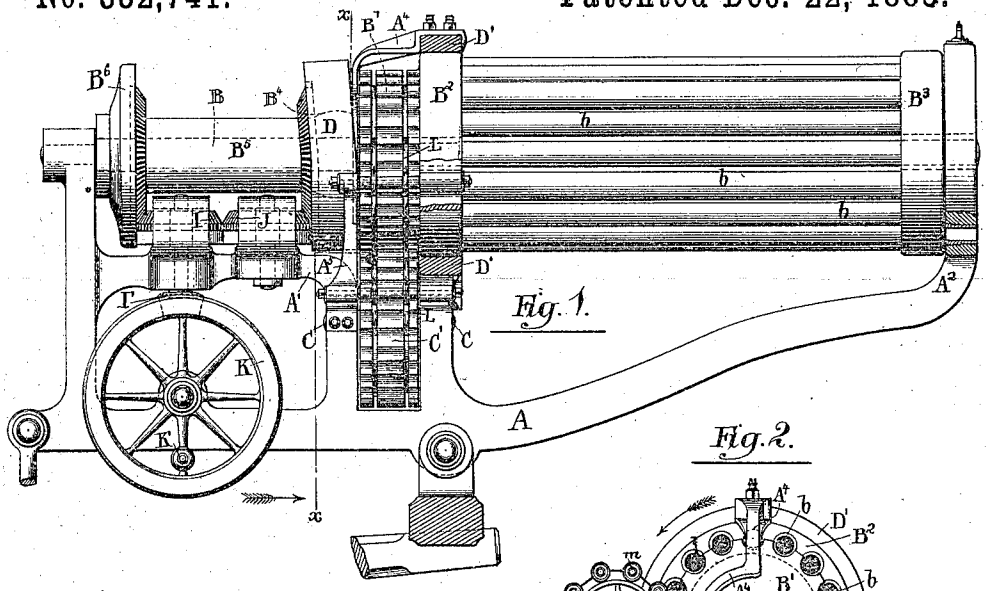
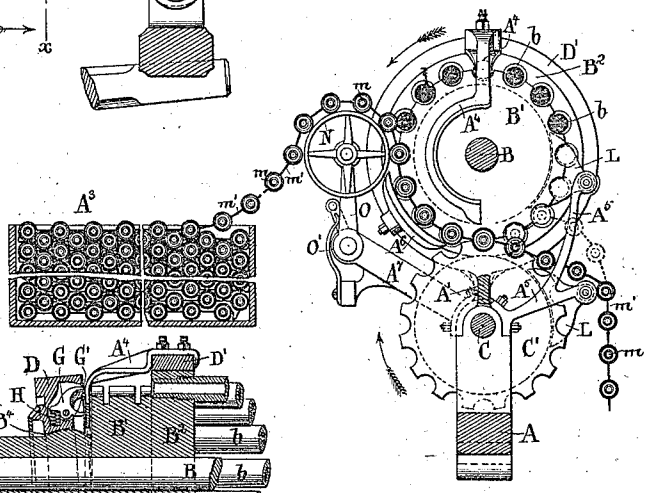


Fig. 1.

Fig. 2.



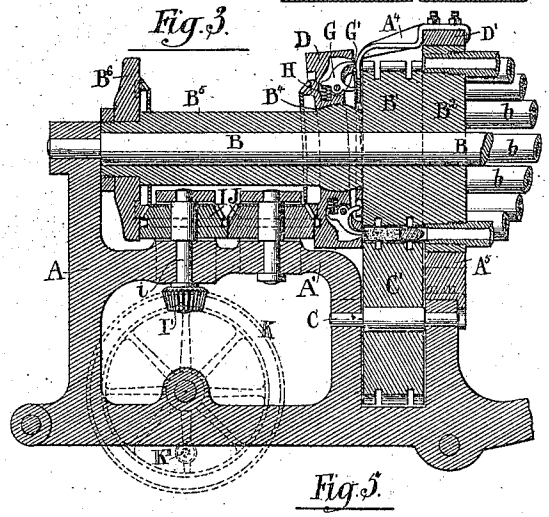


Fig. 3.

Fig. 4.

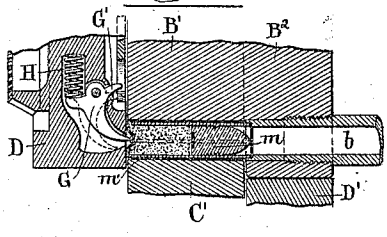
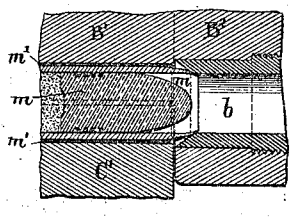


Fig. 5.



Witnesses:-

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CHARLES H. PALMER, OF NEW YORK, N. Y.

MACHINE-GUN.

SPECIFICATION forming part of Letters Patent No. 332,741, dated December 22, 1885.

Application filed January 28, 1884. Renewed May 7, 1885. Serial No. 164,734. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. PALMER, of New York city, in the State of New York, have invented certain new and useful Improvements in Automatic Repeating-Guns, of which the following is a specification.

I employ cartridges of copper or brass, and string a great number together by a flexible connection, to facilitate the feeding of the cartridges to the firing-place by mechanical means. The cartridges are held at the moment of firing between two stout wheels, each of which is recessed to a depth to receive half the cartridge. These wheels strongly support the cartridge laterally, while the breech is covered with a strongly-backed disk. The firing-hammers are mounted in this disk.

In what I esteem the most complete form of the invention there are a number of barrels mounted on a wheel or revolving frame, coinciding in size and form and in rapidity of revolution with one of the wheels which carry the cartridges, and which support the force of the discharge. The cartridges are fired in succession as rapidly as may be desired, the firing being effected each through a different barrel until the set of barrels has made a complete revolution, when the round of discharges through the same barrels is again repeated, and so on until all the cartridges belonging to that string are used.

The accompanying drawings form a part of this specification, and represent what I consider the best means of carrying out the invention.

Figure 1 is a general side elevation. Fig. 2 is a transverse section on the line *x x*, Fig. 1, showing the novel parts with so much of the other parts as is necessary to indicate their relation thereto. Fig. 3 is a section through the principal parts in the plane of the axes of the two principal wheels. Fig. 4 is a section through a portion, on a larger scale, in the plane of the axis of one of the cartridges. Fig. 5 is a corresponding section, showing the front end of the cartridges on a still larger scale, illustrating the relations of the thin front edges of the cartridge-case to the adjacent surfaces of the barrel.

Similar letters of reference indicate like parts in all the figures where they occur.

A is the frame-work, certain portions being designated, when necessary, by additional marks, as A′ A^2. It may be mounted on a carriage of any suitable construction, only a small portion of which is shown. In the framing A is mounted a stout shaft, B, on which is fixed a wheel, B′, and two larger wheels, B^2 B^3, between which latter are mounted rifled barrels *b*. Immediately in rear of the wheel B′ is a spherical bearing, B^4. In the rear of that is a sleeve, B^5, on the rear end of which is a wheel, B^6. The wheels B′ and B^2, the spherical bearing B^4, and the sleeve B^5 are forged or cast in a single piece. The exterior of the wheel B′ has semi-cylindrical cavities extending longitudinally in line with the barrels *b*.

C is a short shaft mounted in the fixed frame-work A. On this is a wheel, C′, having semi-cylindrical cavities matching those in the wheel B′.

The cartridges are marked *m*. They are of a length a little greater than the thickness of the wheels B′ C′. These are inserted in pockets formed in knitted or woven fabric *m*′, thus forming a long flexible series equally spaced. They are stored in a reservoir, A^3, mounted conveniently alongside, and are successively brought into position and discharged through the several barrels as each passes its lowest point in its circuit. Each cartridge is at the moment of firing closely confined, and efficiently struck by a suitable firing-pin at the proper moment, the means for effecting all which will now be described.

D is a large ring mounted on the spherical bearing B^4, with freedom to oscillate slightly thereon. Its upper edge stands at a little distance in rear of the adjacent face of the wheel B′, while its lower edge presses firmly against the latter, and forms a firm abutment for pressing against the rear end of each cartridge when the latter is fired. The ring D is chambered to contain hammers G—one for each barrel—with liberty for them to move. Each hammer is actuated by a spring, H, to effect the blow. It is drawn back by the engagement of a short arm, G′, with a fixed track, A^4, bolted on the rigid ring D′, which loosely encircles the wheel B^3, and having the proper form to withdraw the hammer and compress the spring and then liberate it suddenly as the

hammer reaches the firing-point. Each hammer acts on the cartridge by a relatively small surface, which is protruded through a corresponding small hole. The adjacent surface of the ring D and the small point of the hammer protruding through it form a tight abutment at the rear of the cartridge at the moment of firing.

The ring D turns at the same rate as the ring B^2 and its series of barrels. Each cartridge as it approaches the point where it is gripped tightly between the wheels B′ C′ is by the abutment-ring D thrust endwise into the slightly counterbored end of the barrel *b* through which it is to be fired. The front end of the cartridge is thin, and, being of copper or analogous soft material, is easily contracted by being pressed into the barrel. It assumes the condition shown in Fig. 5, the contracted front end serving as a complete guide for the smooth passage of the projectile and the volume of gas at high tension which follows it to be transferred across the joint from the cartridge-case into the barrel.

There are two wheels, I and J, between the wheel B^6 and the ring D. The lower part of each wheel I and J is a roller, adapted to receive and transmit a great force without yielding. These rollers exactly fill the space, and by pressing against each other and the wheel B^6 and ring D hold the latter against yielding to the force of the explosion. The mid-height of each wheel I and J is formed with spur-gear or with equivalent projections and recesses, which engage the rollers and wheels reliably together. The upper portion is bevel-gear, which engages with corresponding bevel-gears on the adjacent faces of the wheel B^6 and of the ring D. Rotary motion is communicated to the wheel I by means of the beveled wheel I′, fixed on the lower end of its shaft *i*, and which is engaged by a beveled gear-wheel, K, turned by the operator through the aid of a crank-handle, K′. The operator by turning this handle rotates the series of barrels and also the ring D, revolving the latter in the same time as the former.

Two deep grooves are turned in the peripheries of the wheels B′ C′. In these are mounted a pair of plows, L, which are fixed on a branched bracket, A^5. These plows disengage the string of cartridges if they should stick in their respective semicircular cavities in either the wheel B′ or C′ after the firing.

A^6 is a curved piece lying concentric to the wheel B′, and at a proper distance therefrom to hold the cartridges properly in their semicircular cavities on their passage downward to the point of firing. This is mainly important when the last end of a string of cartridges is being carried down.

N is a light smooth wheel, mounted in a fixed position, but with liberty to yield a little by the turning of its supporting-link O on the pivot by which it is suspended on the bracket A^7. The link is subject to the force of a spring, O′, arranged as shown. It urges the wheel N and the string of cartridges which are led over it into the proper relations to the wheel B′, but with liberty to yield to accommodate any slight inequalities.

Modifications may be made in the forms and proportions within wide limits. The number of the barrels may be varied. The size of the gear-wheels may be varied so as to give a greater or less number of discharges with each turn of the crank.

I claim as my invention—

1. In a repeating gun, the two wheels B′ C′, recessed on their peripheries, as described, to receive and hold the cartridges, in combination with each other and with a revolving abutment-ring carrying exploding-hammers, and with a barrel, as *b*, as set forth.

2. The wheels B′ C′, recessed as described to receive and hold the cartridges, and having annular grooves about their peripheries, combined with the plows L, bearing in such grooves, and means for revolving said wheels, substantially as set forth.

3. In combination with the series of barrels supported on a revolving axis, B, the wheels B′ C′, recessed to receive and hold the cartridges, the abutting-ring D, and means, substantially as described, for moving the said parts at the same rate of speed, whereby the hammers which are supported in the ring, the barrels, and the cartridge-holding recesses will register correctly, as set forth.

4. In combination with the wheels B′ C′, as described, and the ring D, mounted on the axis B by a universal joint, the series of hammers G, having arms G′, the springs H, the fixed track A^4, and means for revolving the said ring and wheels at a uniform speed, as set forth.

5. The combination, with the wheels B′ C′, having semi-cylindrical recesses for holding the cartridges, and barrels *b*, counterbored at their rear ends, of the ring D, supported on the axis B, and adapted to force the cartridge-shell into close contact with the barrel as the abutting portion approaches the part where the semi-cylindrcal recesses form a complete chamber, as set forth.

6. In a repeating-gun, the abutment-wheels I, J, adapted to serve the double function of transmitting a strong compressive force and of conveying motion, in combination with the rear wheel, B^6, and with the abutment-ring D, mounted on a universal joint, and with means for holding and firing cartridges, all arranged for joint operation substantially as herein specified.

In testimony whereof I have hereunto set my hand, at New York city, New York, this 23d day of January, 1884, in the presence of two subscribing witnesses.

C. H. PALMER.

Witnesses:
LOUIS M. F. WHITEHEAD,
WM. C. DEY.