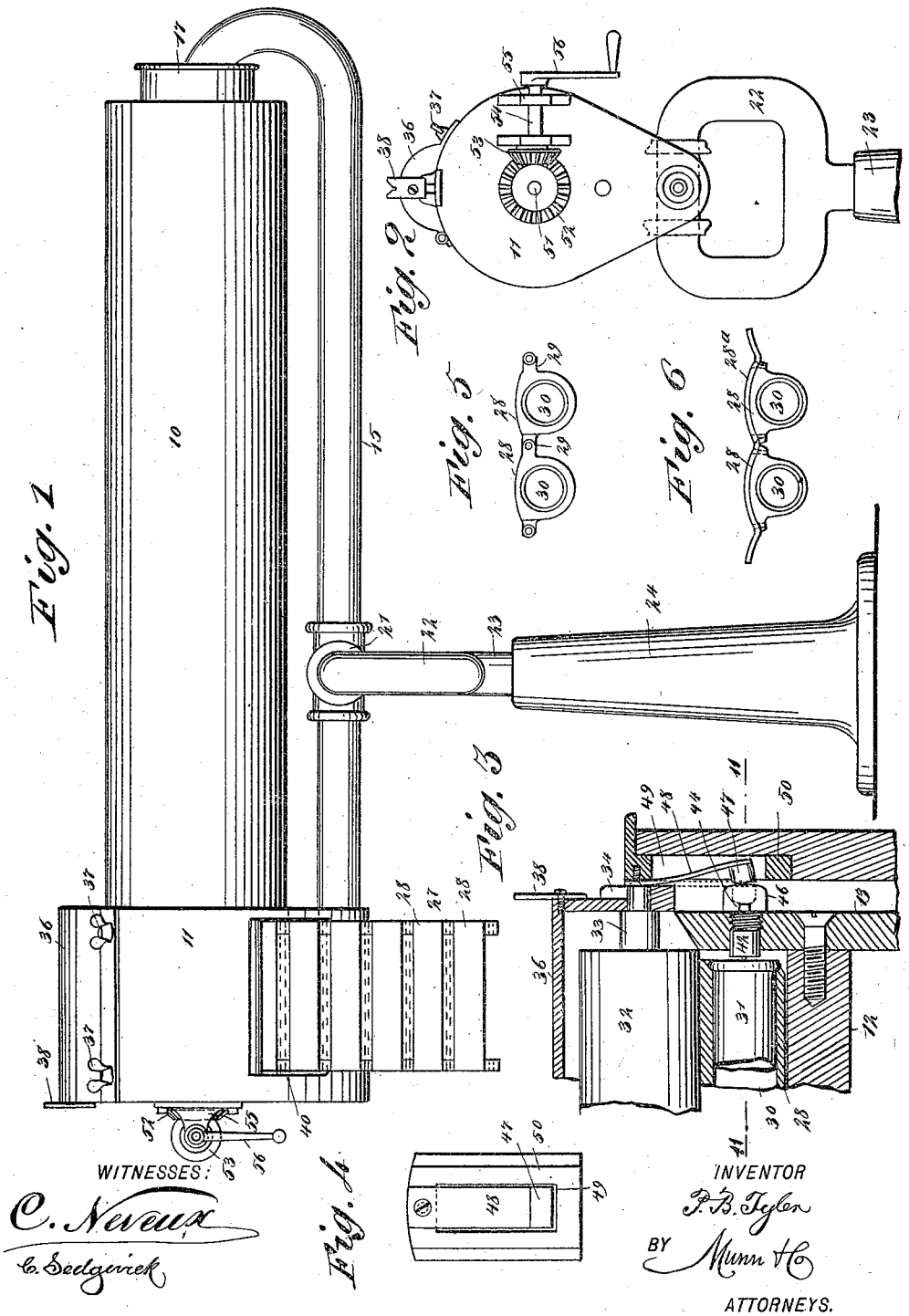
(No Model.) 2 Sheets—Sheet 1.

P. B. TYLER.

WATER POWER MACHINE GUN.

No. 523,185. Patented July 17, 1894.



WITNESSES:
C. Neveux
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ATTORNEYS.

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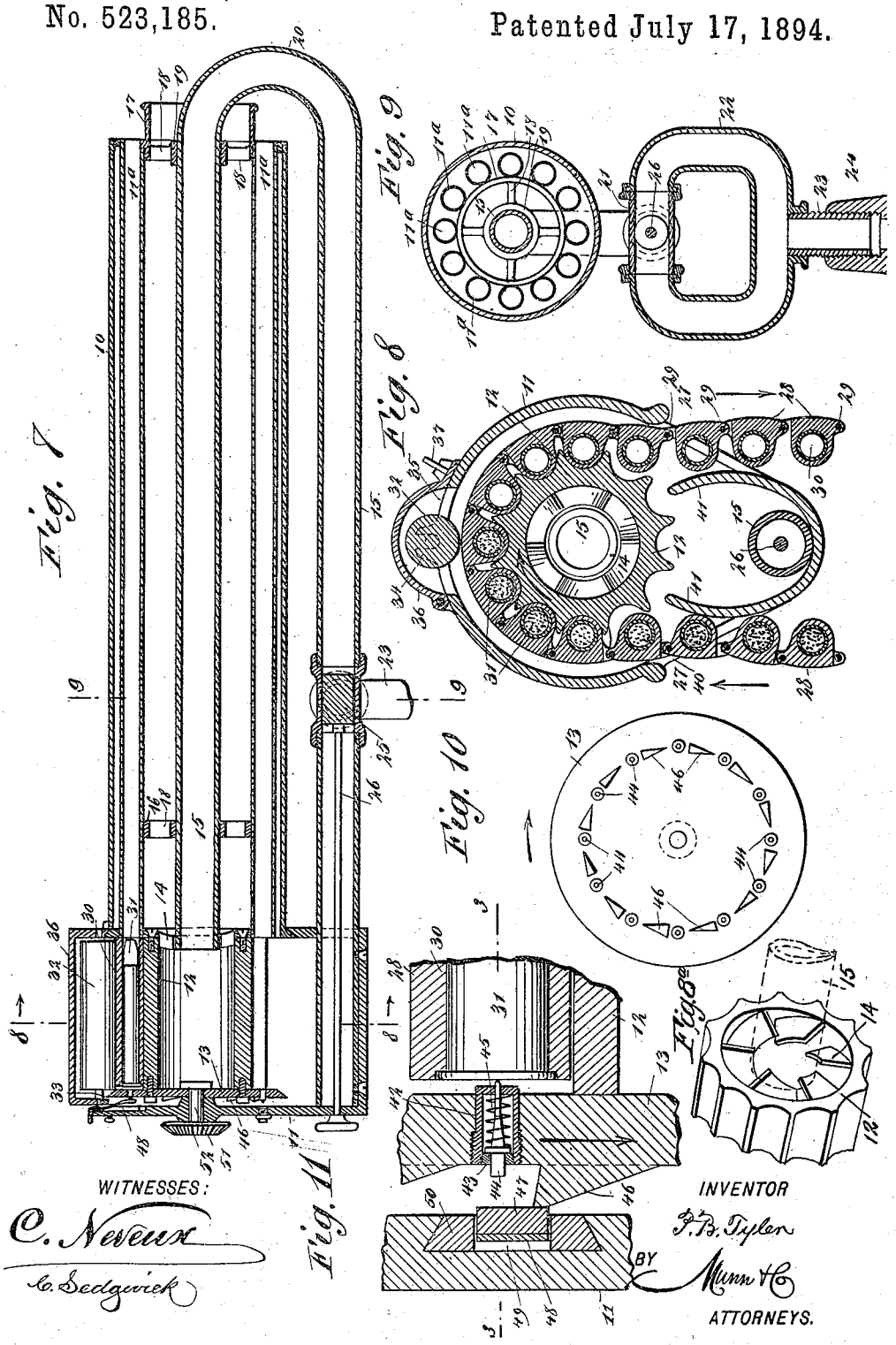

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UNITED STATES PATENT OFFICE.

PARDON B. TYLER, OF SPOKANE, WASHINGTON.

WATER-POWER MACHINE-GUN.

SPECIFICATION forming part of Letters Patent No. 523,185, dated July 17, 1894.

Application filed May 15, 1893. Serial No. 474,267. (No model.)

To all whom it may concern:

Be it known that I, PARDON B. TYLER, of Spokane, in the county of Spokane and State of Washington, have invented a new and Improved Machine-Gun, of which the following is a full, clear, and exact description.

My invention relates to improvements in rapid firing guns; and the object of my invention is to produce a machine gun of extremely simple construction, which is strong and durable, is adapted to discharge a continuous stream of bullets, is constructed in such a way that it cannot readily get out of repair, is arranged to operate by water power so that when the power is turned on the gun will then work automatically, which is arranged so that it may be quickly aimed, and which is provided with a simple gear mechanism by which it may be fired in case the water power gives out.

To this end my invention consists in certain features of construction and combinations of parts, as will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of a gun showing my improvements. Fig. 2 is a broken rear elevation of the gun. Fig. 3 is an enlarged detail section on the line 3—3 in Fig. 11 and illustrates the firing mechanism. Fig. 4 is a detail elevation of one of the spring hammers and its supporting slide. Fig. 5 is a detail view of two connected links of the cartridge belt. Fig. 6 is a similar view of a modified form of the belt. Fig. 7 is a central vertical longitudinal section through the barrel and the breech case. Fig. 8 is a cross section on the line 8—8 in Fig. 7, and shows the cartridge belt and its actuating mechanism in detail. Fig. 8ª is a detail perspective view of the water motor. Fig. 9 is a cross section on the line 9—9 in Fig. 7. Fig. 10 is a rear elevation of the breech block; and Fig. 11 is a section on the line 11—11 in Fig. 3.

The gun is provided with a main revoluble cylinder 10, the length of which corresponds to the length of the gun barrels, and this cylinder at its rear enters the breech case 11 in which the firing mechanism is contained. Extending longitudinally through the cylinder 10 and arranged circumferentially within it are parallel barrels 11ª through which the bullets are fired. In the breech case, and secured to the end of the cylinder 10, is a revoluble cog wheel or drum 12 the grooves in which serve as supports for the cartridges when they are fired, and the grooves and teeth of the wheel or drum also actuate the cartridge belt and feed it, as hereinafter described.

The wheel or drum 12 has at its rear end a breech block 13 which will be hereinafter more particularly described and has at its forward end, a water wheel 14 by which the drum and cylinder 10 are revolved, and this water wheel may be of any suitable construction, as it is not claimed in detail as a part of this invention. The water is delivered horizontally to the wheel from the pipe 15, which extends longitudinally into the center of the cylinder 10 from the front end of the cylinder and is held centrally within the same. The main cylinder turns on a collar 16 and on the discharge nozzle 17, which are provided with spokes 18 secured to the pipe 15. The waste water circulates around the barrels 11ª keeping them cool, and the nozzle projects far enough to prevent the water from running back into the barrels.

The supply pipe 15 is bent, as shown at 20, so as to extend beneath the cylinder 10 and it also extends into the lower portion of the case 11, as shown clearly in Fig. 7. The supply pipe is pivotally supported in a coupling 21, as shown in Fig. 9, and connects with a bent pipe 22 of a generally rectangular shape, which pipe forms a supporting frame and has at its lower end a nipple 23 which is journaled in the hollow supporting base 24, which base is connected with a suitable source of water supply in any convenient way. It will be seen that this arrangement enables the gun to be supported so that it may be swung on its horizontal axis, which is the coupling 21, or it may be swung on its vertical axis which is the nipple 23, and in this way it may be conveniently and accurately aimed. The pipe 15 is provided with a suitable valve 25 which is adapted to close the inlet to the pipe, as shown in Fig. 7, and this valve is provided with a suitable rod or stem 26 which projects outward through the back of the breech case 11, and this enables the water supply to be controlled from the rear end of the gun.

The cartridges are supplied to the gun by means of a belt 27 which is shown clearly in Fig. 8, and which is preferably formed of a

series of nearly semi-elliptical links 28 which are hinged together at their edges, as shown at 29, and the rounded portions of which are adapted to fit snugly between the teeth of the cog wheel or drum 12. The links are shown clearly in Fig. 5, and are provided with longitudinal bores 30 in which cartridges 31 are inserted.

If desired, the links 28 may be secured to a flexible back 28^a, as illustrated in Fig. 6, but the form shown in Figs. 5 and 8 is preferred.

The belt, as it passes over the cog wheel, travels beneath a roller or buffer 32 which has end trunnions 33 and these are adapted to rest in suitable supports 34 above the drum or cog wheel 12, and on opposite ends of the breech case 11. The breech case is open at the top, as shown at 35 in Fig. 8, to provide for the roller, and this opening is covered by a swinging cap 36 which may be fastened down by thumb screws 37 or equivalent fastening. The roller 32 acts as a buffer, as described, and causes the belt to be pressed downward so as to run smoothly over the cog wheel. The friction between the roller and the cartridge belt is very slight, and the roller is therefore superior to stationary presser plates such as are ordinarily used in guns of the herein described type.

On the cap 36 is a sight 38 which may be of any usual kind, and this enables the gun to be accurately aimed in the customary manner.

It will be seen from the above description that the revolution of the cog wheel will cause the belt 27 to be turned so as to bring the bores of the links 28 into consecutive alignment with the barrels 11^a of the gun, and it is obvious that the belt must have sufficient length to permit the cartridges to be inserted in that portion of the belt which hangs below the case 11, while the upper cartridges are being fired. To provide for the feeding of the belt 27, the case 11 is provided on its sides and near the bottom with slots 40 through which the belt extends, and the lower portion of the case is bent inward to form guides 41, as shown clearly in Fig. 8, which guides are adapted to strike the inner sides of the links 28 and enable them to run smoothly into the grooves of the cog wheel or drum 12.

In the breech block 13 at points opposite the bores of the cartridge links 28 and the grooves of the cog wheel or drum 12 are cylinders or cases 42 which are screwed into the breech block, as shown best in Figs. 3 and 11, and which are closed at their outer ends by plugs 43 and in each case or cylinder is a firing pin 44, of substantially the usual kind, which projects through the opposite ends of the cylinder and is adapted to be forced against a cartridge so as to explode the same. The firing pins 44 are each pressed normally outward by a spring 45 which is held in the cylinder 42 and which presses against a collar on the firing pin. Adjacent to each firing pin is an inclined tripping cam 46, these cams being arranged circumferentially, as shown clearly in Fig. 10, and they are adapted to actuate the spring hammers 47 so as to cause the latter to spring against the firing pins and fire the cartridges.

Each hammer 47 is secured to a spring shank 48, and the latter is carried in a slot 49 of a block 50 which is dovetailed into the breech case 11, as shown clearly in Fig. 11, and the hammers are normally pressed outward by the tension of their spring shanks. When, however, the breech block 13 revolves it brings the inclined tripping cams 46 into successive contact with the hammers so as to depress the same, and as the cams pass over the hammers they permit the hammers to spring out and strike the firing pins.

It will be readily understood that the hammers and inclined cams may be arranged in relation to each other so that any desired number of hammers will be simultaneously sprung so as to strike their opposing firing pins.

The action of the water-wheel 14 will revolve the drum or cog wheel and cylinder 10 and feed the cartridge belt under ordinary circumstances, but a hand gear is provided so that in case the water supply gives out the cog wheel may be turned and the gun operated by hand. To this end the breech block 13 has secured to it at the center a shaft 51, see Fig. 7, which is journaled in the back of the case 11 and which at its rear end, is provided with a beveled gear wheel 52 meshing with another gear wheel 53 which is carried by a shaft 54, see Fig. 2, and the latter is journaled in suitable brackets 55 on the back of the case 11, and the shaft is provided with a detachable crank 56 and by means of this crank the gear mechanism may be turned and the cog wheel 12 revolved when necessary.

The operation of the gun is as follows:—The water is turned on in the pipe 15 and as it rushes through the pipe it impinges on the water wheel 14 and so keeps the drum or cog wheel 12 and cylinder 10, turning. The waste water runs out through the nozzle 17 and as the drum turns it carries the cartridge belt around it and brings the cartridges opposite the firing pins 44 and the barrels 11^a. The cartridges are thrust into the bores of the links 28 while the latter are beneath the case 11, so that the belt may thus be kept full. As the cartridges are carried opposite the hammers, the inclined cams 46 trip the hammers and throw them against the firing pins and thus the cartridges are exploded and the bullets ejected through the barrels 11^a. It will be seen that the gun will thus automatically fire a continuous stream of bullets so that the operator needs only to see that the gun is accurately aimed, and for this reason the gun is very effective.

It will also be observed that there is very little mechanism about the gun which can get out of repair, and it will be seen too that if the water supply gives out the gun may be rapidly fired by hand.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A machine gun, comprising a plurality of circumferentially arranged barrels, a feed wheel arranged in the rear of the barrels and held to turn on their common center, a cartridge belt carried by the feed wheel and adapted to hold cartridges opposite the barrels, a water-wheel operatively connected with the feed wheel, a water pipe arranged to supply water to the water wheel, and mechanism for exploding the cartridges, substantially as described.

2. A machine gun, comprising a plurality of circumferentially arranged barrels held in a cylinder, a revoluble feed wheel arranged at the rear end of the cylinder, a water-wheel secured to the feed wheel, a cartridge belt carried by the feed wheel and adapted to hold cartridges opposite the barrels, a water pipe extending longitudinally into the cylinder to supply water to the water-wheel, and mechanism for exploding the cartridges, substantially as described.

3. A machine gun, comprising a plurality of circumferentially arranged barrels held in a cylinder, a revoluble feed wheel or drum at the rear end of the cylinder and provided with teeth to engage a cartridge belt, a water-wheel secured to and adapted to turn the feed wheel or drum, a cartridge belt carried by the feed wheel and adapted to hold cartridges opposite the barrels, a support pivotally carrying the gun, a water pipe connected with the support and extending longitudinally into the cylinder, to supply water to the water-wheel, and mechanism for exploding the cartridges, substantially as described.

4. A machine gun, comprising a barrel cylinder, a plurality of barrels arranged circumferentially in the cylinder, a central waste pipe in the cylinder, a revoluble feed wheel or drum at the rear end of the cylinder and provided with teeth on its face, a water-wheel secured to and adapted to turn the feed wheel, a cartridge belt composed of a series of links adapted to fit between the teeth of the feed wheel and provided with longitudinal bores to receive the cartridges, a water pipe extending longitudinally into the cylinder to supply water to the water wheel, and mechanism actuated by the turning of the feed wheel to fire the cartridges, substantially as described.

5. A machine gun, comprising a barrel cylinder, a breech case at the rear end of the cylinder, a plurality of circumferentially arranged barrels extending longitudinally through the cylinder, a feed wheel or drum secured to the cylinder and held to revolve in the case, a water-wheel secured to and adapted to turn the feed wheel, a water pipe extending longitudinally into the cylinder to supply water to the water-wheel, a cartridge belt extending through slots in the case and held upon the feed wheel, the links of the belt having bores to align with the barrels and to carry cartridges, and mechanism actuated by the movement of the feed wheel to fire the cartridges, substantially as described.

6. A machine gun, comprising a plurality of circumferentially arranged barrels, a feed wheel or drum held to turn on the common center of the barrels, a cartridge belt carried by the drum and provided with links having bores to receive cartridges and to register with the barrels, mechanism for exploding the cartridges by the movement of the feed wheel or drum, a water motor to turn the drum, and means for discharging the water from the motor into the space inclosed by the barrels to cool the latter substantially as described.

7. A machine gun, comprising a barrel cylinder, a plurality of circumferentially arranged barrels therein, a feed wheel or drum secured to the rear end of the cylinder and provided with a water wheel in the rear of the cylinder, a cartridge belt carried by the feed drum and adapted to hold cartridges behind the barrels, mechanism for exploding the cartridges by the movement of the feed drum, a water pipe extending longitudinally into the cylinder to supply water to the water wheel, the pipe being also bent to extend beneath the barrel cylinder, and a swivel support for the supply pipe and cylinder, the support forming also a water connection with the supply pipe, substantially as described.

8. In a machine gun, the combination of the barrel cylinder, the circumferentially arranged barrels therein, the discharge nozzle projecting from the end of the cylinder, the revoluble feed wheel secured to the cylinder and provided with a water-wheel in the rear of the cylinder, a cartridge belt carried by the feed wheel and adapted to hold cartridges behind the barrels, and a water pipe extending longitudinally into the cylinder to supply water to the water-wheel, substantially as described.

9. The combination, with the circumferentially arranged barrels, of the revolving feed drum held to turn on the common center of the barrels and provided with a toothed face, a cartridge belt carried by the feed drum and provided with a series of longitudinally bored links to receive cartridges and to register with the barrels, a breech block secured to the rear end of the feed drum and adapted to form a backing for the cartridges, firing pins arranged in the breech block opposite the bores of the cartridge belt, a non-rotatable breech case located behind the breech block, spring-pressed hammers held on the said stationary breech case, behind the breech block, and mechanism for actuating the hammers and throwing them against the firing pins by the movement of the block, substantially as described.

PARDON B. TYLER.

Witnesses:
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THOMAS S. BEACH.