

No. 627,404.

Patented June 20, 1899.

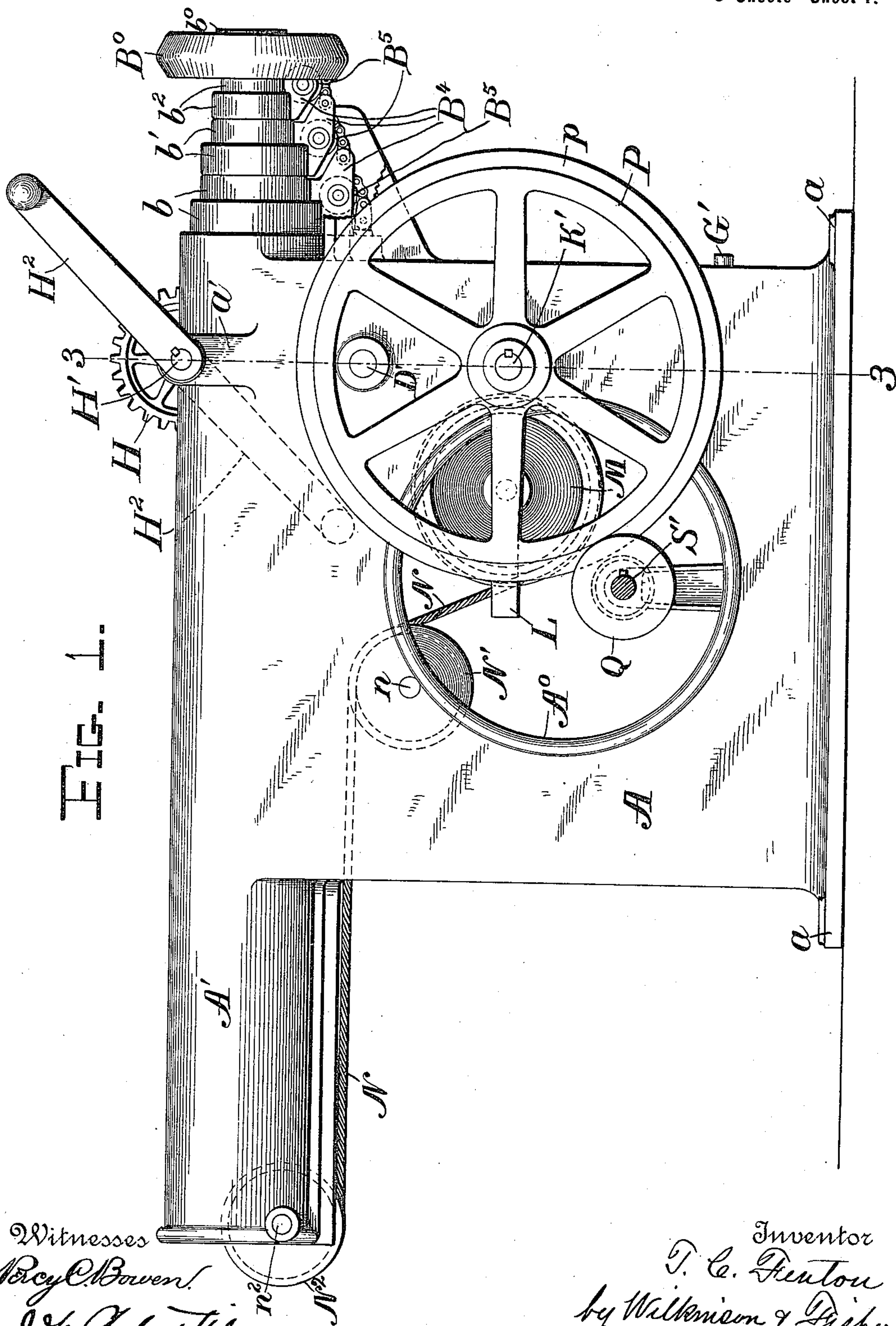
T. C. FENTON.
RAMMER FOR ORDNANCE.

(Application filed June 28, 1898.)

(No Model.)

3 Sheets—Sheet 1.

FIG. 1.



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3 Sheets—Sheet 2.

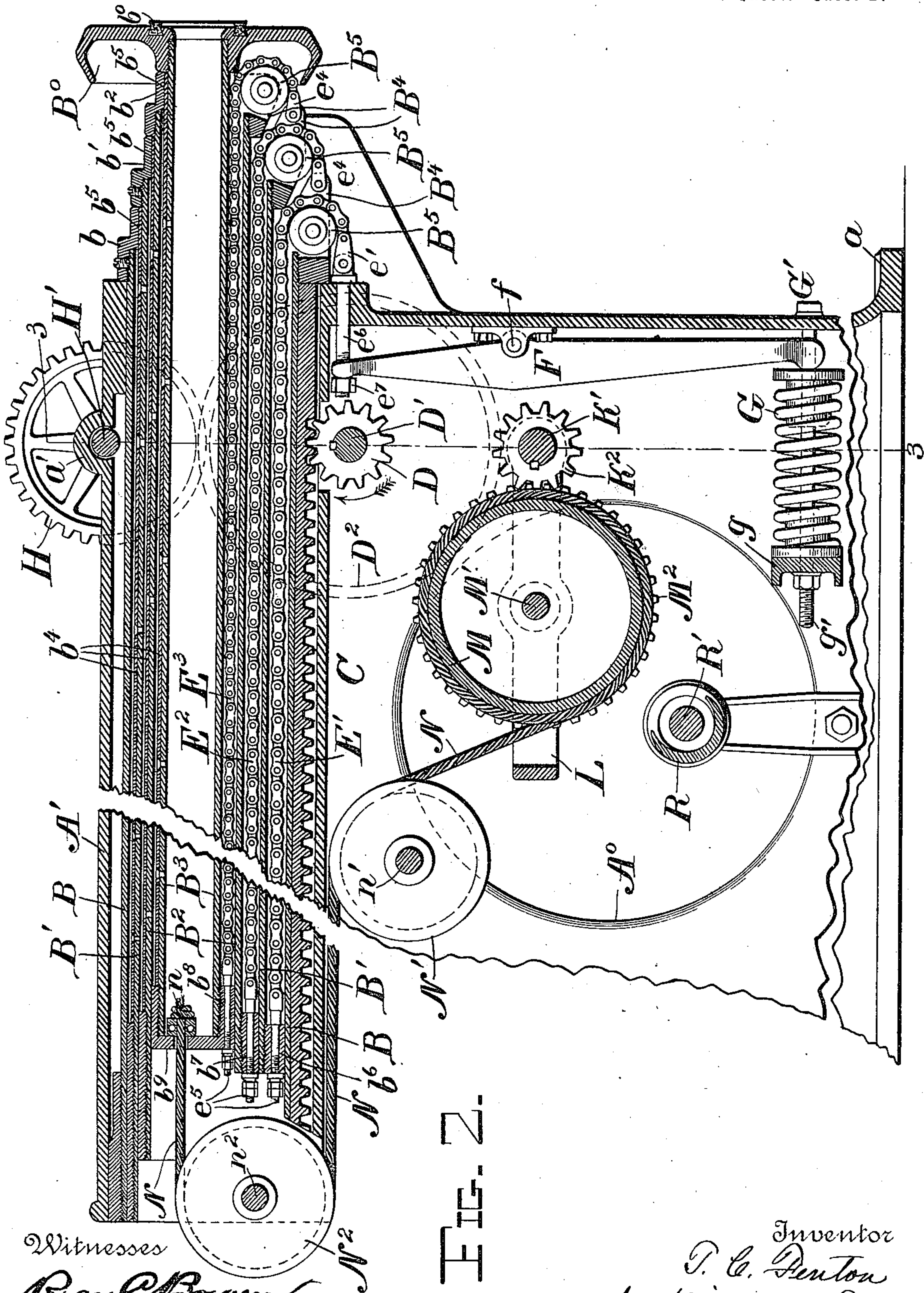


FIG. 2.

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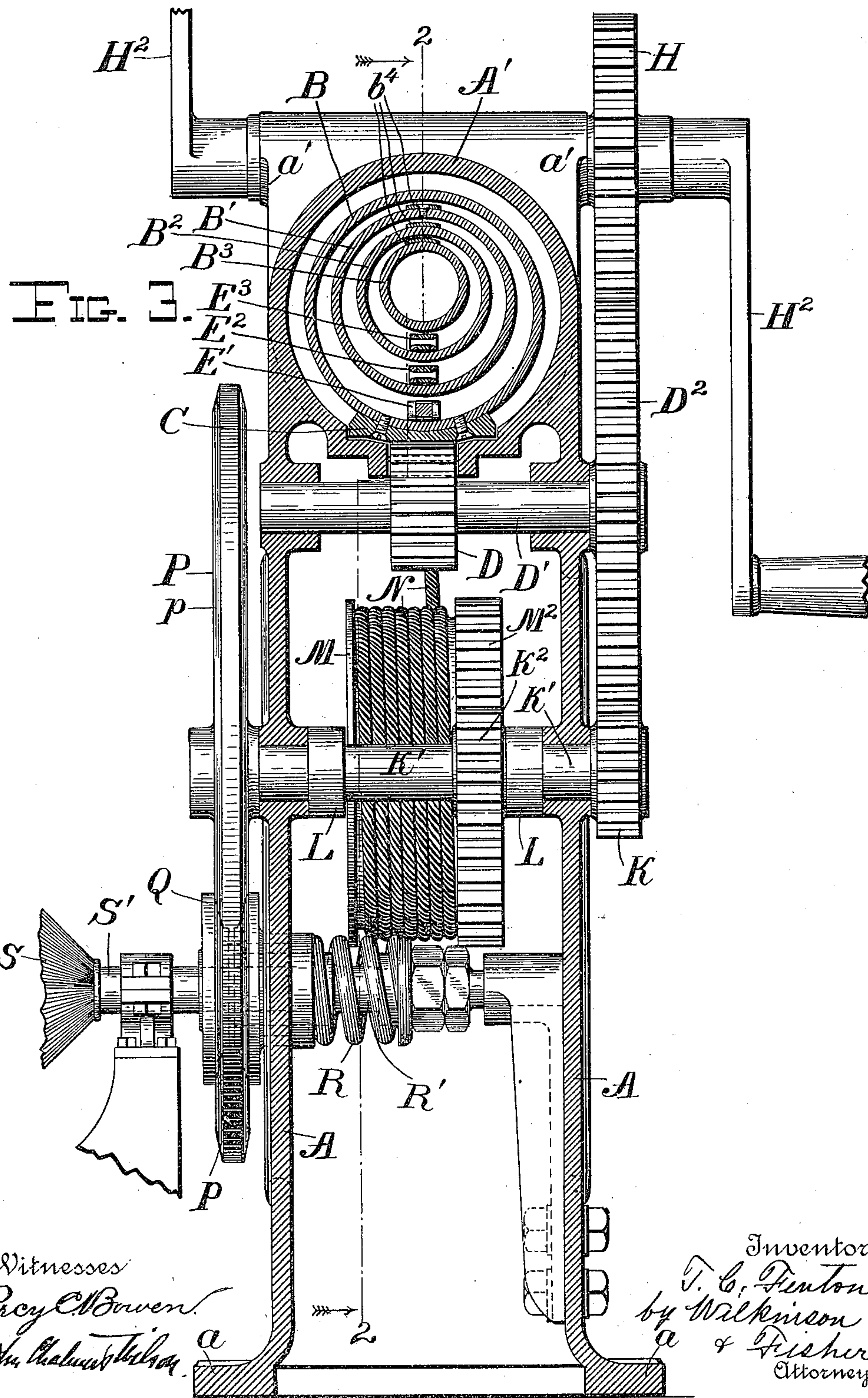
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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

THEODORE CORNELL FENTON, OF THE UNITED STATES NAVY.

RAMMER FOR ORDNANCE.

SPECIFICATION forming part of Letters Patent No. 627,404, dated June 20, 1899.

Application filed June 28, 1898. Serial No. 684,680. (No model.)

To all whom it may concern:

Be it known that I, THEODORE CORNELL FENTON, lieutenant, United States Navy, stationed at the navy-yard, Washington, District of Columbia, have invented certain new and useful Improvements in Rammers for Ordnance; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in telescopic rammers for use with heavy ordnance; and it consists in an improved construction of rammer combining great structural strength, lightness, compactness, and efficiency and in improved means for running the rammer out and for withdrawing the same suitable for use with hand-power, electricity, steam or pneumatic power, or hydraulic power.

In the accompanying drawings I have shown the invention as operated either by hand-power or by an electric motor; but the means for applying the power and the power itself may be varied at will.

My invention also relates to a certain improved construction and certain combinations of parts, that will be hereinafter more fully described and claimed.

Reference is had to the accompanying drawings, in which the same parts are indicated by the same letters throughout the several views.

Figure 1 represents a side elevation of the rammer and its mount or pedestal and shows the rammer run in or withdrawn to its rearward position. Fig. 2 represents a vertical longitudinal section of the rammer and its mount, the section being taken on the broken line 2 2 of Fig. 3 and looking in the direction of the arrows, the scale of Fig. 2 being somewhat larger than that of Fig. 1. Fig. 3 represents a transverse section along the line 3 3 of Figs. 1 and 2, the scale of Fig. 3 being still further enlarged.

A represents the pedestal, mount, or frame, which may be made as a single casting, in which the parts are mounted, which frame is provided with flanges *a* to secure the pedestal to the deck or other platform. The top of the frame is preferably in the form of an

arch or a cylinder slotted along its lower side and projecting to the rear, as at *A'*, while suitable journal-bearings *a'* are provided for the crank-shaft *H'*. The frame is preferably cast with the annular opening *A⁰* to secure increased lightness and also accessibility to the parts of the mechanism.

The rammer proper consists of a series of hollow cylinders arranged eccentrically one within another, as shown in Fig. 3. I have shown four of these tubes or cylinders *B*, *B'*, *B²*, and *B³*, to the inner one of which the rammer-head *B⁰* is secured, having on its face the yielding annular pad *b⁰*. The tubes are kept eccentric by eccentric collars at each end, the collars on the forward end being substantially Z-shaped, as shown at *b*, *b'*, and *b²* in Fig. 2, and are slotted to permit the passage therethrough of the ribs or feathers *b⁴*, secured to their respective tubes, which collars or ribs serve as guides to prevent the tubes from rotating on their axes when being run out or run in.

To the rear end of the tubes *B'*, *B²*, and *B³*, respectively, the eccentric collars *b⁶*, *b⁷*, *b⁸* are secured, while the outer tube *B* has a rack *C* secured along one side thereof, preferably the lower side, in which rack the pinion *D* meshes. This pinion is mounted on the shaft *D'*, which is rotated by hand or other power, as will be hereinafter described.

The front end of each of the tubes *B*, *B'*, and *B²* carries journal-bearings *B⁴* for a pulley *B⁵*, and over these pulleys pass the chains *E'*, *E²*, and *E³*, respectively. The chain *E'* is secured at one end, as by a bolt *e⁵*, to the eccentric collar *b⁶* (see Fig. 2) and then passes between the tubes *B* and *B'* over the outer pulley *B⁵*, and its opposite end *e'* is fast to the bolt *e⁶*, secured by the nut *e⁷* to the buffer-lever *F*. This lever is pivoted to the frame *A*, as at *f*, and has its lower arm pressed on by the heavy spring *G*, mounted on the bolt *G'* and held between the adjustable washer *g* and the lower arm of the lever *F*. This spring should be under heavy compression. In practice a compression of about twelve hundred pounds has proved satisfactory. The second chain *E²* is secured to the second eccentric collar, and after passing forward and reeving over a pulley *B⁵*, as before, is secured to the journal-bearing *B⁴* or any other fixed part

of the next outer tube. In the same way the third chain E^3 is rove, and similarly should there be any more joints in the telescopic rammer than are shown in the drawings.

5 The inner tube B^3 has its rear head closed by the rear portion b^9 of the collar b^8 , the whole forming a ferrule over the rear end of the tube, and to this ferrule the hauling-in rope N is secured, as at n . (See Fig. 2.)

10 From an inspection of Fig. 2 it will be seen that if the pinion D be turned in the direction of the arrow the rack C will be run out, causing the tube B and outer pulley B^5 to advance. The chain E' , having one end fast to
15 the bolt e^6 , will pay out from the other end at a speed double the velocity of the rack C , and thus starting the tube B' , and this tube in turn will start the tube B^2 , and so on for the tube B^3 , the speed outward of each tube being
20 twice as great as that of the tube next outside of it. Thus it will be seen that with a slow motion to the pinion D the rammer-head B^0 will be rapidly run out.

To relieve the shock that results when all
25 the sections of the rammer are run out, the buffer-lever F is provided.

It will be obvious that various methods of running the rammer in and out may be adopted, but the means preferred by me will now
30 be described.

It is generally preferable whenever possible to have ordnance machinery so arranged that it may be operated at will either by hand or by some other motive power, and I have
35 shown means for operating the rammer either by hand or by an electric motor, or by a combination of the two, if desired. It will be understood, however, that any other suitable source of power may be substituted for the
40 electric motor, if desired.

The hand-cranks H^2 , preferably one on each side of the rammer, are fast to the shaft H' , carrying the gear-wheel H , meshing in the gear-wheel D^2 , fast to or feathered on the shaft
45 D' , and thus the requisite motion for running out the rammer is imparted to the pinion D . So much for running out by hand. For running out by other power, as by the electric motor S , I connect to the shaft S' of this motor one of the members of a friction-clutch Q ,
50 the opposite member of which is pressed on by the strong spring R , surrounding the shaft R' . Any well-known means for throwing the clutch-coupling into and out of engagement
55 may be adopted, and as such means do not constitute a part of my invention for the sake of clearness they are omitted from the drawings. The friction-disk P has a beveled rim
60 p , that engages the friction-clutch Q when the power mechanism is in operation, and this disk is fast on or feathered to the shaft K' , carrying the pinion K , which meshes in the gear-wheel D^2 , and thus drives the shaft D' and pinion D .

65 Whether run out by hand or other power it becomes important to keep the rope N at all times taut and ready for running in and

to operate the same for running the rammer in when desired. This is done as follows: L represents a yoke loosely pivoted on the shaft
70 K' and forming journal-bearings for the shaft M' of the drum M , on which the inner end of the rope N is wound. One end of this drum carries the gear-teeth M^2 , meshing with the
75 pinion K^2 , fast on the shaft K' , and thus as this shaft K' is turned as the rammer is being run out the rope N unwinds from the drum, while if the shaft K' be turned in the reverse
80 direction, as would be the case when the rack C was being run in, the rope N would be wound up again on the drum. This rope passes over the pulleys N' and N^2 , journaled, as at n' and n^2 , on the frame A , and the weight
85 of the drum and its yoke L is at all times sufficient to keep the rope N taut, while at the same time the method of suspending the drum prevents any injury to the parts from sudden
90 jerks or strains. Thus it will be seen that as the rammer is run out the rope N will unwind from the drum and that when the motion of the pinion D is reversed for running in the rack it will run in the outer tube and the drum will wind up the hauling-in rope N and will haul in the other tubes, restoring the parts to the initial or run-in position. (Shown
95 in Figs. 1 and 2.)

It will be evident that the outer cylinder B may be moved directly, as by a piston, or in any other well-known way, instead of by the rack and pinion shown in the drawings. 100

It will be obvious that other means for operating the running-in rope may be adopted, if desired.

It will be seen that the eccentric collars at each end of the tubes enable the running-out
105 chains to be rove between the tubes without cutting away the tubes at all, and thus impairing the well-known strength of the hollow cylinders. Moreover, the herein-described construction renders it possible to
110 construct a series of telescopic cylinders so arranged that great strength and rigidity are secured, while the total diameter of that part of the rammer that enters the breech of the gun is kept within the narrow limits pre-
115 scribed by the bore of the gun and of the screw-box.

Many of the various other advantages of the herein-described apparatus will readily suggest themselves to any one skilled in the
120 art.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In a telescopic rammer, the combination
125 with a plurality of hollow cylinders arranged one within another, the inner cylinder carrying a rammer-head, of chains each connected to the exterior of one cylinder and passing over a pulley fastened to the front end of the
130 cylinder next exterior thereto, and then secured to the second exterior part, and means for moving the outer cylinder, substantially as described.

2. In a telescopic rammer, the combination with a plurality of hollow cylinders eccentrically arranged one within another, the inner cylinder carrying a rammer-head, of chains each connected to the exterior of one cylinder and passing over a pulley fastened to the front end of the cylinder next exterior thereto and then secured to the second exterior part, and means for moving the outer cylinder, substantially as described.

3. In a telescopic rammer, the combination with a plurality of hollow cylinders arranged one within another, the inner cylinder carrying a rammer-head, of chains each connected to the exterior of one cylinder and passing over a pulley fastened to the front end of the cylinder next exterior thereto and then secured to the second exterior part, a rack fast to the outer cylinder, a pinion meshing in said rack, and means for rotating said pinion, substantially as described.

4. In a telescopic rammer, the combination with a plurality of hollow cylinders eccentrically arranged one within another, the inner cylinder carrying a rammer-head, of chains each connected to the exterior of one cylinder and passing over a pulley fastened to the front end of the cylinder next exterior thereto and then secured to the second exterior part, a rack fast to the outer cylinder, a pinion meshing in said rack, and means for rotating said pinion, substantially as described.

5. In a telescopic rammer, the combination with a plurality of hollow cylinders arranged one within another, the inner cylinder carrying a rammer-head, of chains each connected to the exterior of one cylinder and passing over a pulley fastened to the front end of the cylinder next exterior thereto and then secured to the second exterior part, means for moving the outer cylinder, and a hauling-in rope secured to the inner cylinder with means for hauling in on said rope to run the rammer in, substantially as described.

6. In a telescopic rammer, the combination with a plurality of hollow cylinders eccentrically arranged one within another, the inner cylinder carrying a rammer-head, of chains each connected to the exterior of one cylinder and passing over a pulley fastened to the front end of the cylinder next exterior thereto and then secured to the second exterior part, and means for moving the outer cylinder, and a hauling-in rope secured to the inner cylinder, with means for hauling in on said rope to run the rammer in, substantially as described.

7. In a telescopic rammer, the combination with a plurality of hollow cylinders arranged one within another, the inner cylinder carrying a rammer-head, of chains each connected to the exterior of one cylinder and passing over a pulley fastened to the front end of the cylinder next exterior thereto and then secured to the second exterior part, a rack fastened to the outer cylinder, a pinion meshing

in said rack, means for rotating said pinion, and a hauling-in rope secured to the inner cylinder, with means for hauling in on said rope to run the rammer in, substantially as described.

8. In a telescopic rammer, the combination with a plurality of hollow cylinders eccentrically arranged one within another, the inner cylinder carrying a rammer-head, of chains each connected to the exterior of one cylinder and passing over a pulley fastened to the front end of the cylinder next exterior thereto and then secured to the second exterior part, a rack fast to the outer cylinder, a pinion meshing in said rack, and means for rotating said pinion, and a hauling-in rope secured to the inner cylinder, with means for hauling in on said rope to run the rammer in, substantially as described.

9. In a telescopic rammer the combination with a mount or frame, of a plurality of hollow cylinders arranged one within another, the inner cylinder carrying a rammer-head, pulleys carried by all but the inner cylinder, chains fast to the rear portion of the several cylinders except the outer cylinder, then leading forward between the cylinders and passing over said pulleys, and being secured to the next outer cylinder but one, and the outer chain being secured to the mount or frame, with means for reciprocating the outer cylinder, and means for restoring the parts to the initial position, substantially as described.

10. In a telescopic rammer, the combination with a mount or frame, of a plurality of hollow cylinders eccentrically arranged one within another, the inner cylinder carrying a rammer-head, pulleys carried by all but the inner cylinder, chains fast to the rear portion of the several cylinders except the outer cylinder, then leading forward between the cylinders and passing over said pulleys, and being secured to the next outer cylinder but one, and the outer chain being secured to the mount or frame, with means for reciprocating the outer cylinder, and means for restoring the parts to the initial position, substantially as described.

11. In a telescopic rammer, the combination with a mount or frame of a plurality of hollow cylinders arranged one within another, the inner cylinder carrying a rammer-head, pulleys carried by all but the inner cylinder, chains fast to the rear portion of the several cylinders except the outer cylinder, then leading forward between the cylinders and passing over said pulleys, and being secured to the next outer cylinder but one, and the outer chain being secured to the mount or frame, a rack fast to the outer cylinder, a pinion meshing in said rack, and means for rotating said pinion, substantially as described.

12. In a telescopic rammer, the combination with a mount or frame, of a plurality of hollow cylinders eccentrically arranged one within another, the inner cylinder carrying a rammer-head, pulleys carried by all but the in-

ner cylinder, chains fast to the rear portion of the several cylinders except the outer cylinder, then leading forward between the cylinders and passing over said pulleys, and being secured to the next outer cylinder but one, and the outer chain being secured to the mount or frame, connected fast to the outer cylinder, a pinion meshing in the rack, a rack, and means for rotating said pinion, substantially as described.

13. In a telescopic rammer the combination with a mount or frame, of a plurality of hollow cylinders arranged one within another, the inner cylinder carrying a rammer-head, pulleys carried by all but the inner cylinder, chains fast to the rear portion of the several cylinders except the outer cylinder, then leading forward between the cylinders and passing over said pulleys, and being secured to the next outer cylinder but one, and the outer chain being secured to the mount or frame, a spring-buffer connected to the end of the outer chain with means for reciprocating the outer cylinder, and means for restoring the parts to the initial position, substantially as described.

14. In a telescopic rammer, the combination with a mount or frame, of a plurality of hollow cylinders arranged one within another, the inner cylinder carrying a rammer-head, pulleys carried by all but the inner cylinder, chains fast to the rear portion of the several cylinders except the outer cylinder, then leading forward between the cylinders and passing over said pulleys, and being secured to the next outer cylinder but one, and the outer chain being secured to the mount or frame, a spring-controlled buffer-lever connected to the end of the outer chain with means for reciprocating the outer cylinder, and means for restoring the parts to the initial position, substantially as described.

15. In a telescopic rammer the combination with a mount or frame, of a plurality of hollow cylinders arranged one within another, the inner cylinder carrying a rammer-head, pulleys carried by all but the inner cylinder, chains fast to the rear portion of the several cylinders except the outer cylinder then leading forward between the cylinders and passing over said pulleys, and being secured to the next outer cylinder but one, and the outer chain being secured to the mount or frame, a spring-buffer connected to the end of the outer chain, a rack and pinion for reciprocating the outer cylinder, and a hauling-in rope for hauling in the inner cylinders, substantially as described.

16. In a telescopic rammer the combination with a mount or frame, of a plurality of hollow cylinders arranged one within another, the inner cylinder carrying a rammer-head, pulleys carried by all but the inner cylinder, chains fast to the rear portion of the several cylinders except the outer cylinder, then leading forward between the cylinders and passing over said pulleys, and being secured to the next outer cylinder but one, and the outer chain being secured to the mount or frame, a spring-controlled buffer-lever connected to the end of the outer chain, a rack and pinion for reciprocating the outer cylinder and a hauling-in rope for hauling in the inner cylinders, substantially as described.

17. In a telescopic rammer the combination with a mount or frame, of a plurality of hollow cylinders arranged one within another, the inner cylinder carrying a rammer-head, pulleys carried by all but the inner cylinder, chains fast to the rear portion of the several cylinders except the outer cylinder then leading forward between the cylinders and passing over said pulleys, and being secured to the next outer cylinder but one, and the outer chain being secured to the mount or frame, a spring-buffer connected to the end of the outer chain, a rack and pinion for reciprocating the outer cylinder, and a hauling-in rope for hauling in the inner cylinders with means for keeping said rope taut and for hauling in on the same when desired, substantially as described.

18. In a telescopic rammer the combination with a mount or frame, of a plurality of hollow cylinders arranged one within another, the inner cylinder carrying a rammer-head, pulleys carried by all but the inner cylinder, chains fast to the rear portion of the several cylinders except the outer cylinder, then leading forward between the cylinders and passing over said pulleys, and being secured to the next outer cylinder but one, and the outer chain being secured to the mount or frame, a spring-controlled buffer-lever connected to the end of the outer chain, a rack and pinion for reciprocating the outer cylinder and a hauling-in rope for hauling in the inner cylinders, with means for keeping said rope taut and for hauling in on the same when desired, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

THEODORE CORNELL FENTON.

Witnesses:

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F. H. BRONAUGH.