

(No Model.)

2 Sheets—Sheet 1.

S. A. MILLER.

EARTH REMOVER

No. 296,990.

Patented Apr. 15, 1884.

Fig: 1.

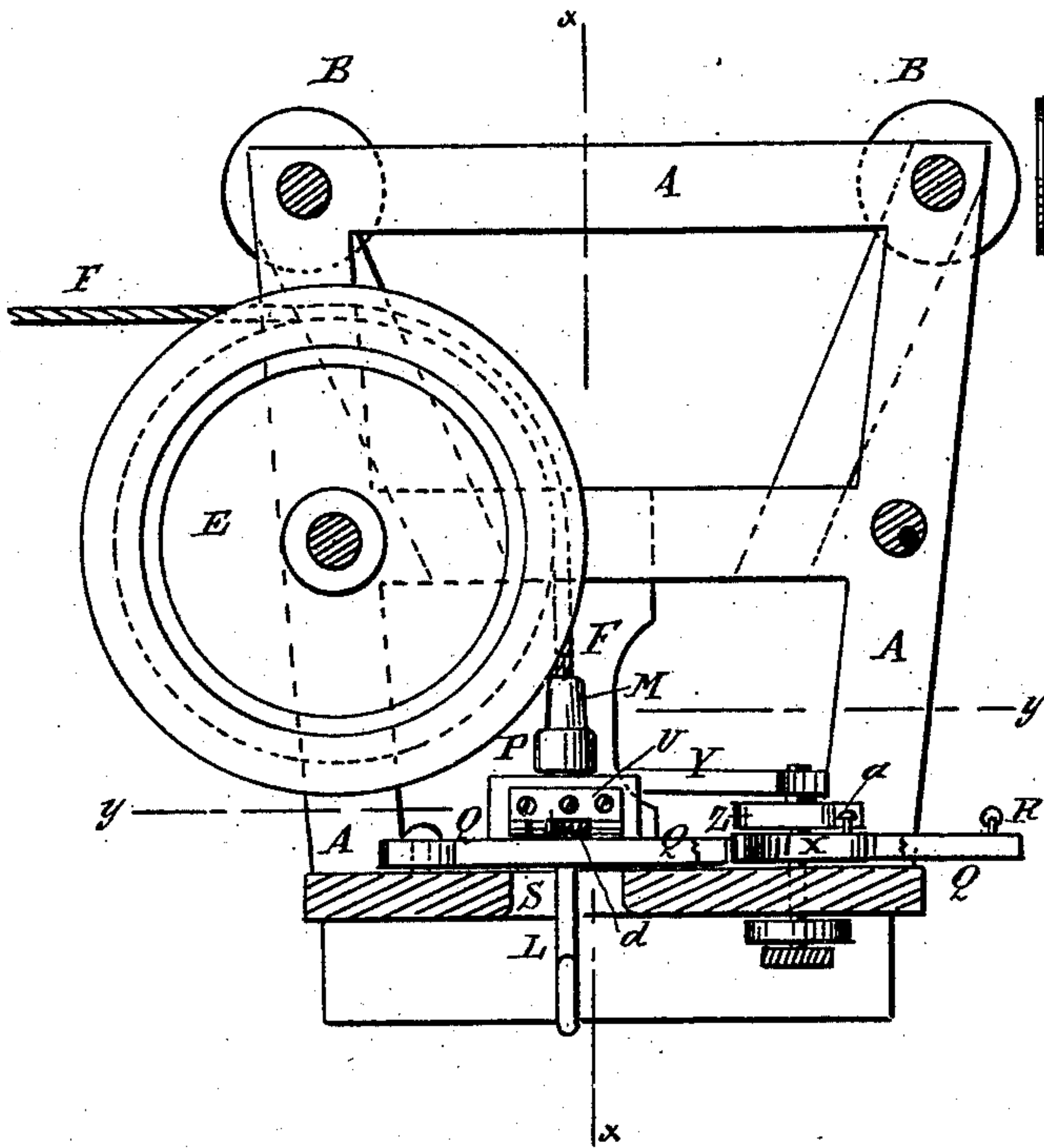


Fig: 2.

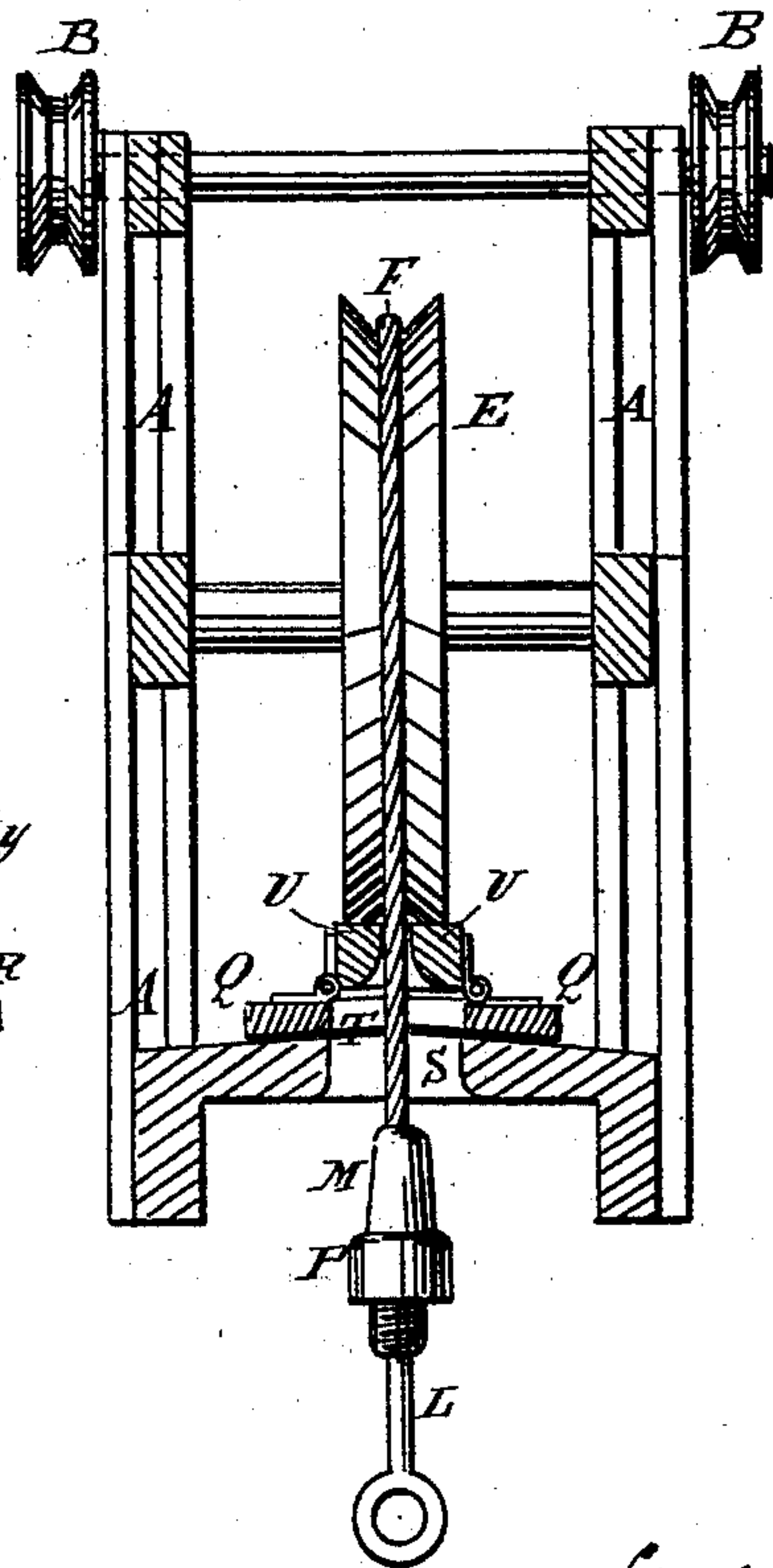


Fig: 3.

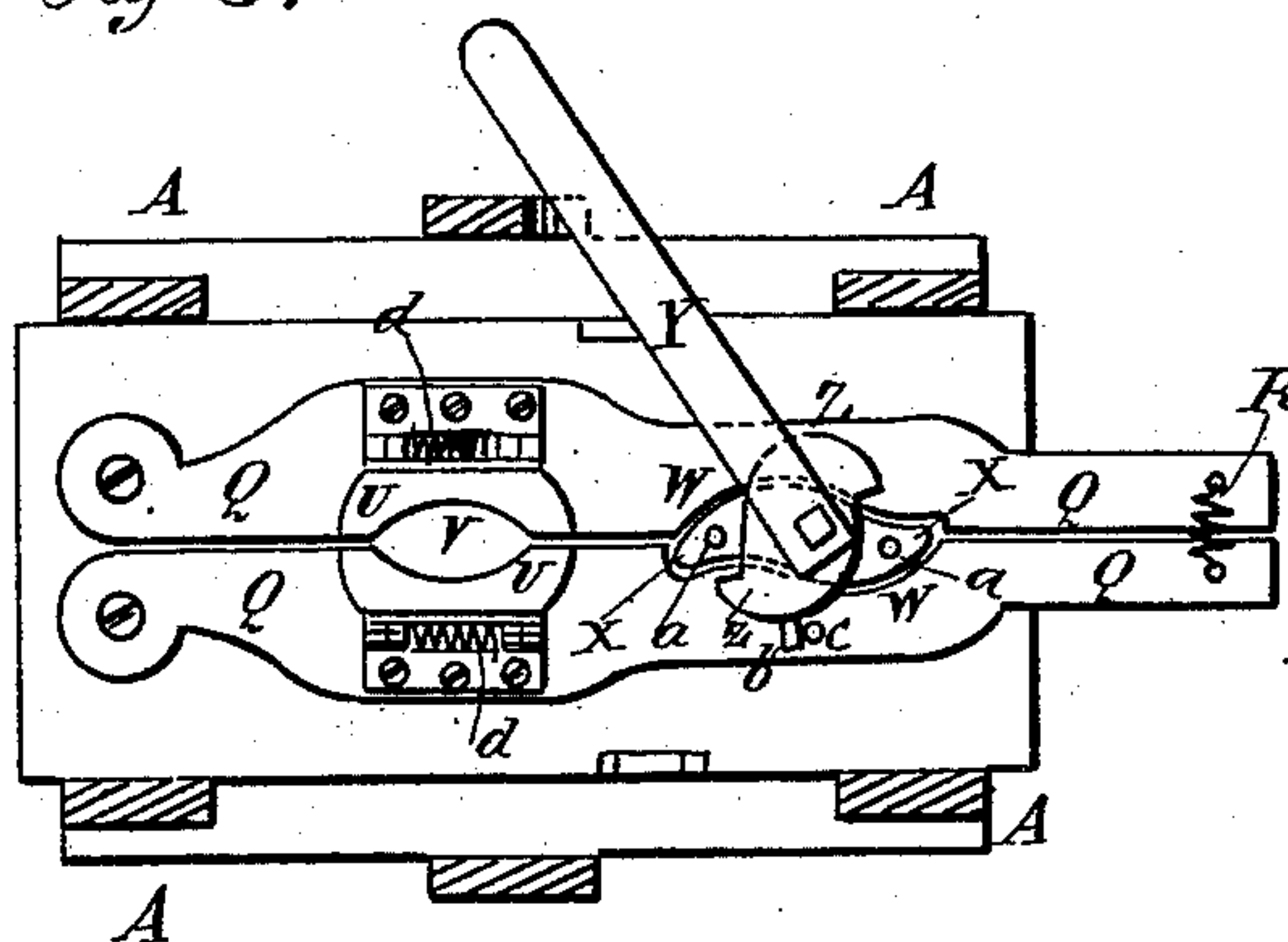


Fig: 4.

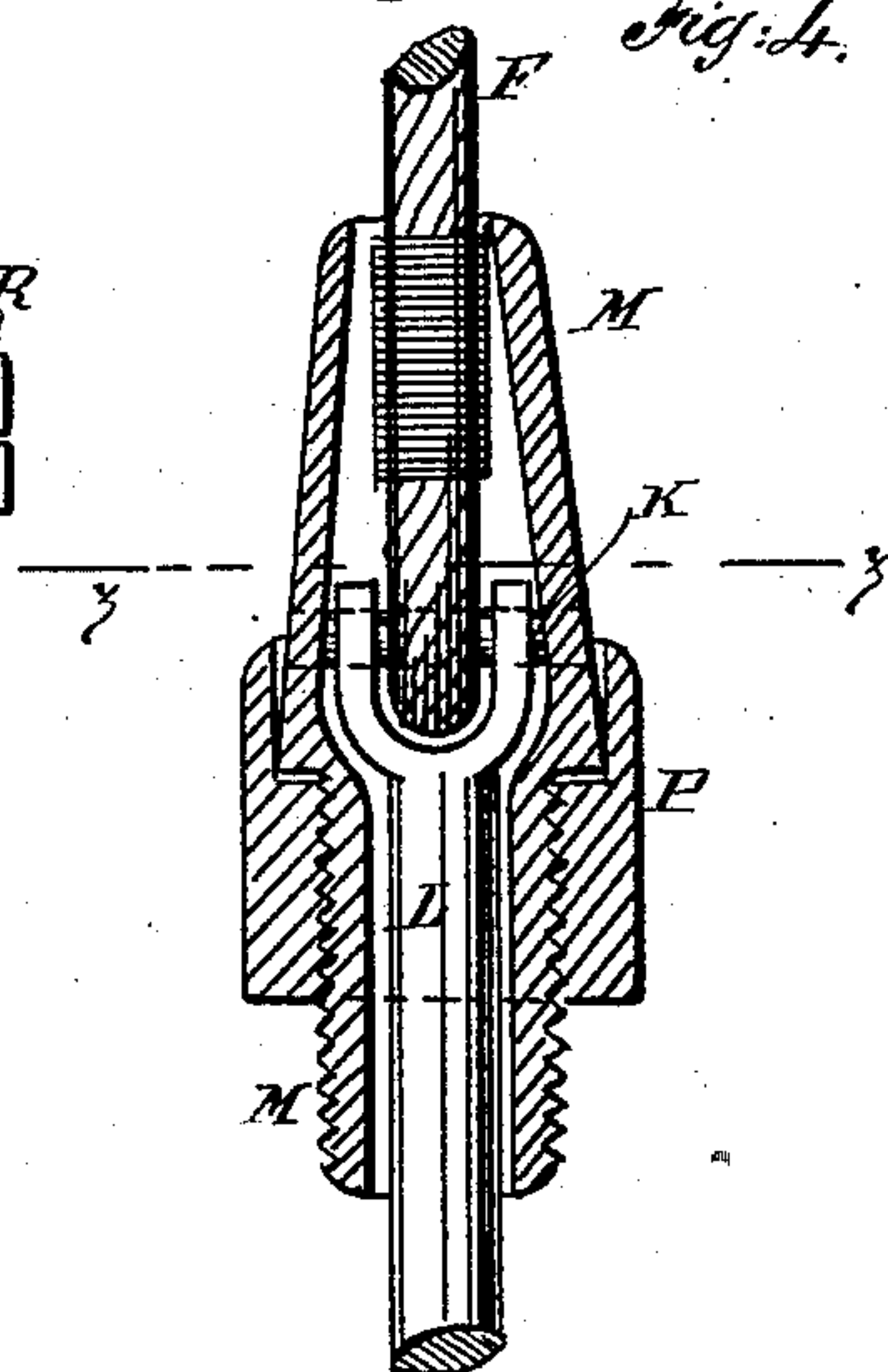
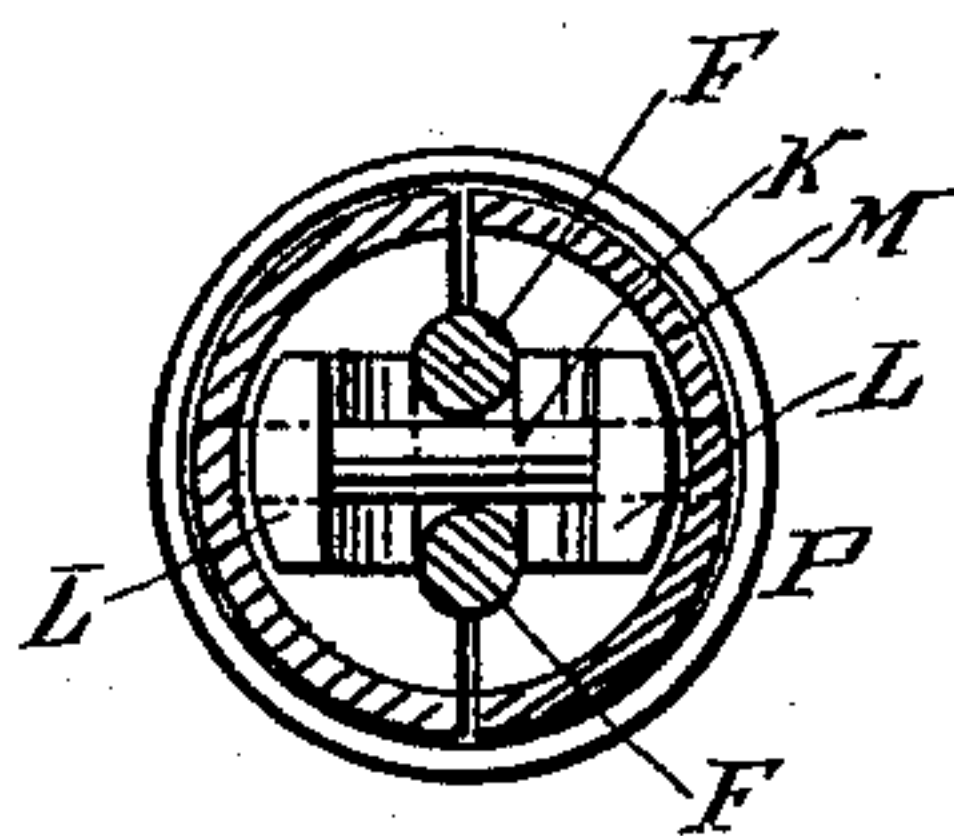


Fig: 5.



WITNESSES:

Chas. Nida.
C. Bedgwick

INVENTOR:

S. A. Miller
BY *Munn & Co*
ATTORNEYS.

(No Model.)

2 Sheets—Sheet 2.

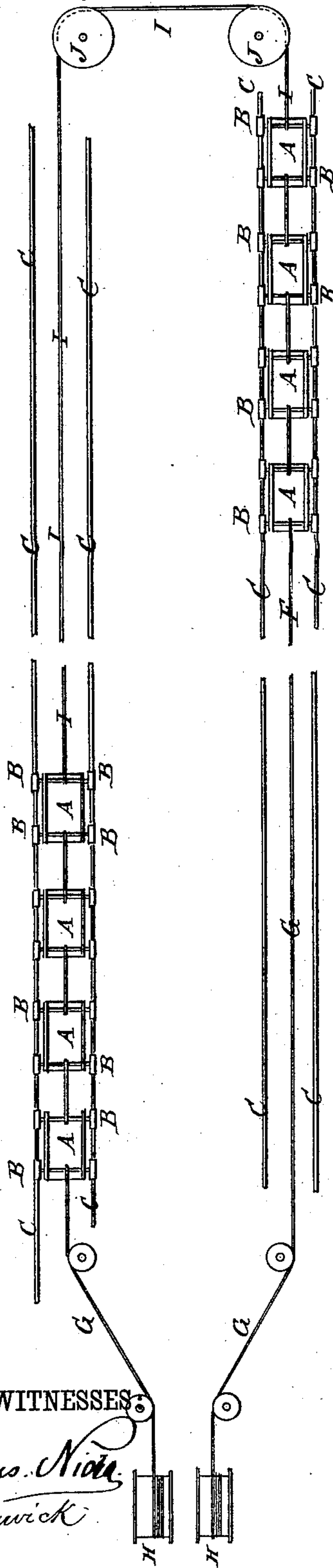
S. A. MILLER.

EARTH REMOVER.

No. 296,990.

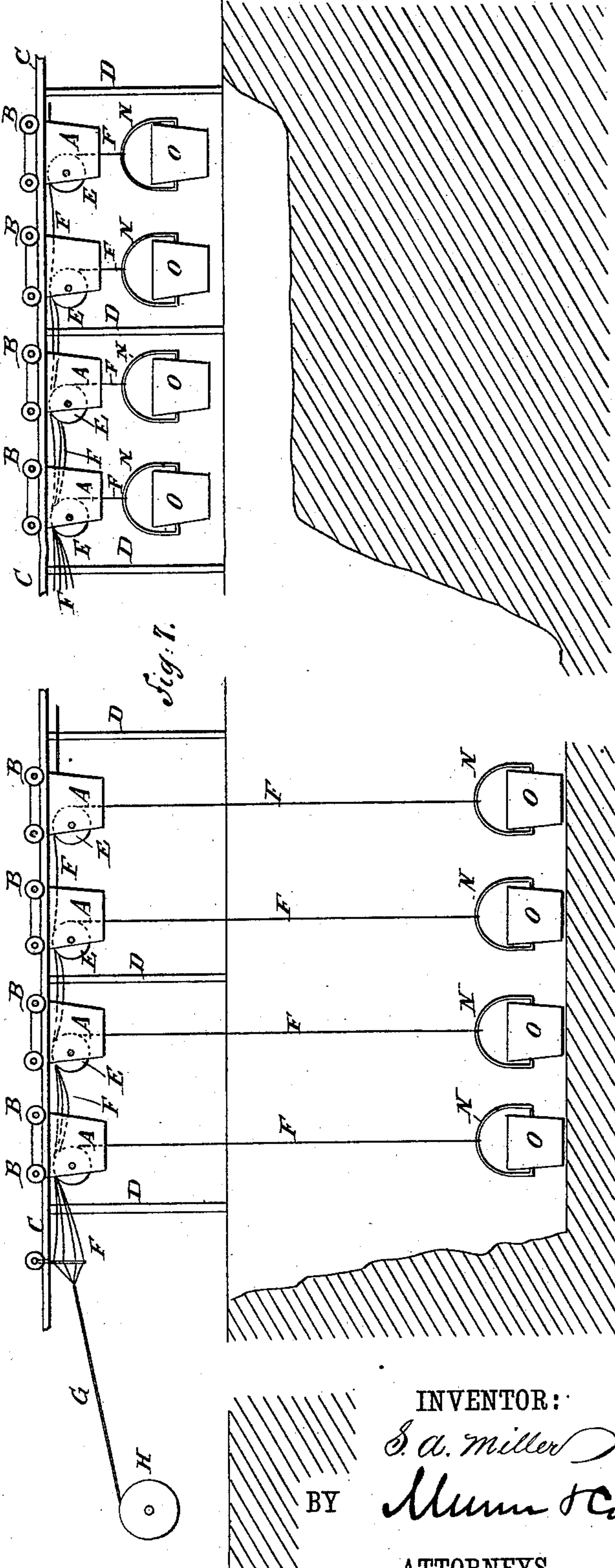
Patented Apr. 15, 1884.

Fig. 6.



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Fig. 7.



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UNITED STATES PATENT OFFICE.

SAMUEL A. MILLER, OF PHILADELPHIA, PENNSYLVANIA.

EARTH-REMOVER.

SPECIFICATION forming part of Letters Patent No. 296,990, dated April 15, 1884.

Application filed August 29, 1883. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL A. MILLER, of Philadelphia, in the county of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in Earth-Removers, of which the following is a full, clear, and exact description.

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

Figure 1, Sheet 1, is a sectional side elevation of one of the bucket-carriages to which my improvement has been applied. Fig. 2, Sheet 1, is a sectional rear elevation of the same, taken through the line *x x*, Fig. 1. Fig. 3, Sheet 1, is a sectional plan view of the same, taken through the broken line *y y*, Fig. 1. Fig. 4, Sheet 1, is a sectional side elevation of the cone and its attachments. Fig. 5, Sheet 1, is a sectional plan view of the same, taken through the line *z z*, Fig. 4. Fig. 6, Sheet 2, is a plan view, illustrating the manner in which the bucket-carriages are moved. Fig. 7, Sheet 2, is a side elevation of the same.

The object of this invention is to facilitate the moving of earth in trenches and promote reliability in the operation of the mechanism and convenience in controlling said mechanism.

The invention consists in an earth-remover constructed with a trip-cone and a pair of levers pivoted to the carriage-bottom and carrying catch-blocks hinged to the said levers, and held in place by springs, the said levers being provided with a double cam operated by a lever provided with a cross-head, whereby the bucket will be firmly supported and can be readily released, as will be hereinafter fully described.

A represents the carriage-frame, one of which is used for each bucket, and which is provided at its upper corners with grooved wheels B, to roll along a track, C, extending along the trench or excavation, and supported upon posts D or other suitable supports.

To the middle forward part of the frame A is pivoted a large grooved pulley, E, over which passes a rope, F. Four (more or less) of the frames A are arranged in a row or set, and

the forward ends of all the ropes F of the set are attached to a single rope, G, the forward end of which is attached to and wound upon a drum, H, driven by a steam-engine or other suitable power. Parallel tracks, C, are equipped in the same manner, but with one draw-rope, G, wound upon its drum in the opposite direction from the first draw-rope, so that each of the said ropes will be unwound from its drum as the other is wound up. To the carriages of the two sets are attached the ends of a rope, I, which passes around guide-pulleys J, pivoted to posts or other suitable supports, so that each set will be drawn back by the advance of the other set.

Upon the end of each rope F is formed an eye, through which passes a pin or bolt, K. The bolt K also passes through the forked upper end of the short rod L and through the hollow cone M. To the other end of the rod L is attached the bail N of the bucket O, in which the earth is to be raised. The cone M is made in two parts or halves, which are secured to each other and to the ends of the pin K by a band, P. The lower part of the cone M is turned down or made smaller, and has a screw-thread formed upon it, into which fits a screw-thread formed upon the inner surface of the lower part of the band P. The upper part of the band P is countersunk to receive the shoulder of the cone M at the upper end of its screw-thread, as shown in Figs. 2 and 4. The bottom of the carriage A has an aperture, S, formed through it of such a size as to allow the cone M to pass through freely.

Upon the bottom of the carriage A are placed two levers, Q, which are laid side by side and longitudinally with the said bottom. The levers Q are pivoted at one end to the end part of the carriage-bottom, and are connected at the other end and held together by a spiral or other shaped spring, R. The adjacent edges of the levers Q, just above the aperture S in the carriage-bottom, are recessed to form an opening, T, of the same size as the said aperture S. To the levers Q, at the opposite sides of the opening T, are hinged at their outer edges blocks U, the adjacent sides of which are recessed to form an opening, V, of such a size as to allow the rope F to pass through it

freely. The lower side of the hinged blocks U around the opening V are curved, as shown in Fig. 2.

In the adjacent edges of the forward parts of the levers Q are formed recesses W, to receive the double cam X, which is pivoted to the bottom of the carriage A.

To the upper end of the pivot of the cam X is attached a lever, Y, to the lower side of the pivoted end of which is attached a cross-head, Z. The end parts of the cross-head Z have shoulders formed upon them to engage with pins *a*, attached to the end parts of the double cam X, so that the said double cam can be operated with an advantage of leverage by operating the said lever Y. The rearward movement of the lever Y is limited by a stop-pin, *b*, attached to the cross-head Z, and which strikes against a pin, *c*, attached to one of the levers Q. With this construction, when a set of buckets, O, has been filled, the drum H is set in motion to wind up the rope G and raise the said buckets. As the buckets O approach the carriage A the cone M passes through the aperture S in the bottom of the carriage A through the opening T in the levers Q and strikes against, turns back, and passes the hinged blocks U, which, as soon as the said cone has passed them, are returned to their former position by the springs *d*, connected with their hinges, so that if the rope F should be slackened the base of the band P will rest upon the upper sides of the said blocks U and support the bucket until the set of buckets O has been drawn to the place where the said buckets are to be dumped. As the cones M pass the hinged blocks U, the bails N of the buckets O strike the bottom of the carriage A, which stops the upward movement of the said bucket, so that any further draft upon the rope F will draw the carriage A forward. When the buckets are to be lowered, the attendant operates the lever Y, which causes the cam X to press the levers Q apart, withdrawing the hinged blocks U from beneath the cones M and allowing the buckets O to descend by their own weight to be again filled. The upper side of the carriage A is slightly inclined from the central line toward each side, as shown in Fig. 2, so that the levers Q can be more readily operated while supporting the weight of the bucket.

The improvement is intended for use in

digging trenches for laying gas-pipes, water-pipes, ditch-tiles, and other long excavations where the earth dug from one part of the work can be thrown into another part, so as to facilitate the removal of the earth and avoid a rehandling of the said earth.

I have described my improvement as applied to an earth-mover, but do not limit myself to that application, as it can be used with advantage in moving coal, stone, grain, hay, and other materials and articles that are to be raised and conveyed to fixed points.

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

1. In an earth-removing apparatus, constructed substantially as herein shown and described, and consisting of the trip-cone, a carriage having the hinged catch-blocks, the levers carrying the said catch-blocks, and the lever-operated cam for separating the levers and catch-blocks and allowing the cone to pass down, as set forth.

2. In an earth-remover, the cone M, constructed, substantially as herein shown and described, in two parts, having a screw-thread upon their reduced lower ends and secured in place by a screw-band having a countersunk upper part, as set forth.

3. In an earth-remover, the combination, with the hoisting-rope F, the coupling-rod L, and their connecting-pin K, of the cone M, and screw-band P, substantially as herein shown and described.

4. In an earth-remover, the combination, with the bottom of the carriage A, of the hinged catch-blocks U, having springs *d*, the recessed levers Q, having spring R, and a lever-separating mechanism, substantially as herein shown and described, whereby the bucket will be supported and can be readily released, as set forth.

5. In an earth-remover, the combination, with the levers Q, carrying the hinged catch-blocks U, of the double cam X and the lever Y, having cross-head Z, substantially as herein shown and described, whereby the said levers and catch-blocks can be readily separated, as set forth.

SAMUEL A. MILLER.

Witnesses:

WILLIAM JARDEN,
J. GORDON SHOWAKER.