

(No Model.)

2 Sheets—Sheet 1.

D. BRENNAN, Jr.
STONE AND ORE CRUSHER.

No. 315,468.

Patented Apr. 14, 1885.

Fig. 3.

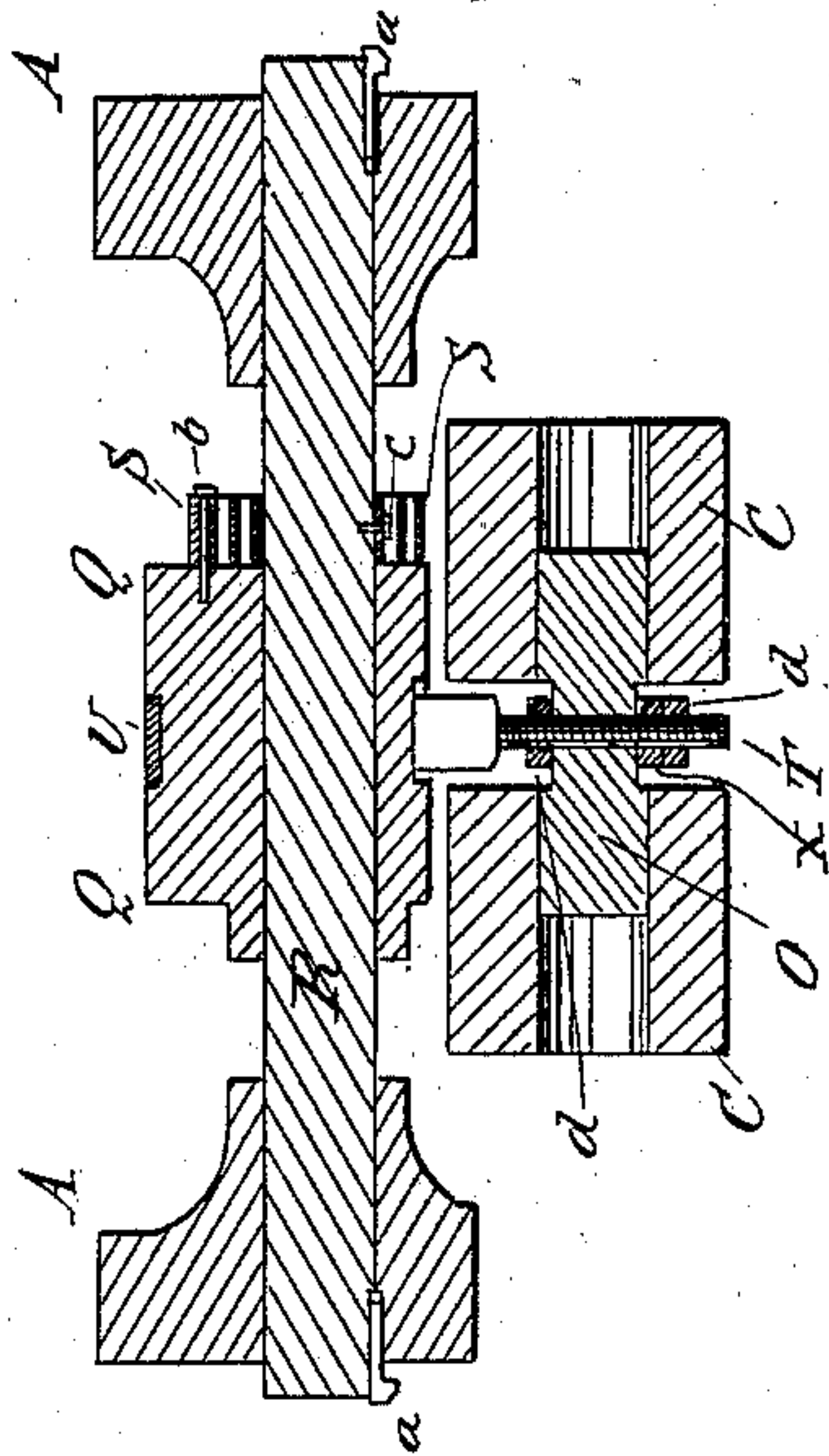


Fig. 2.

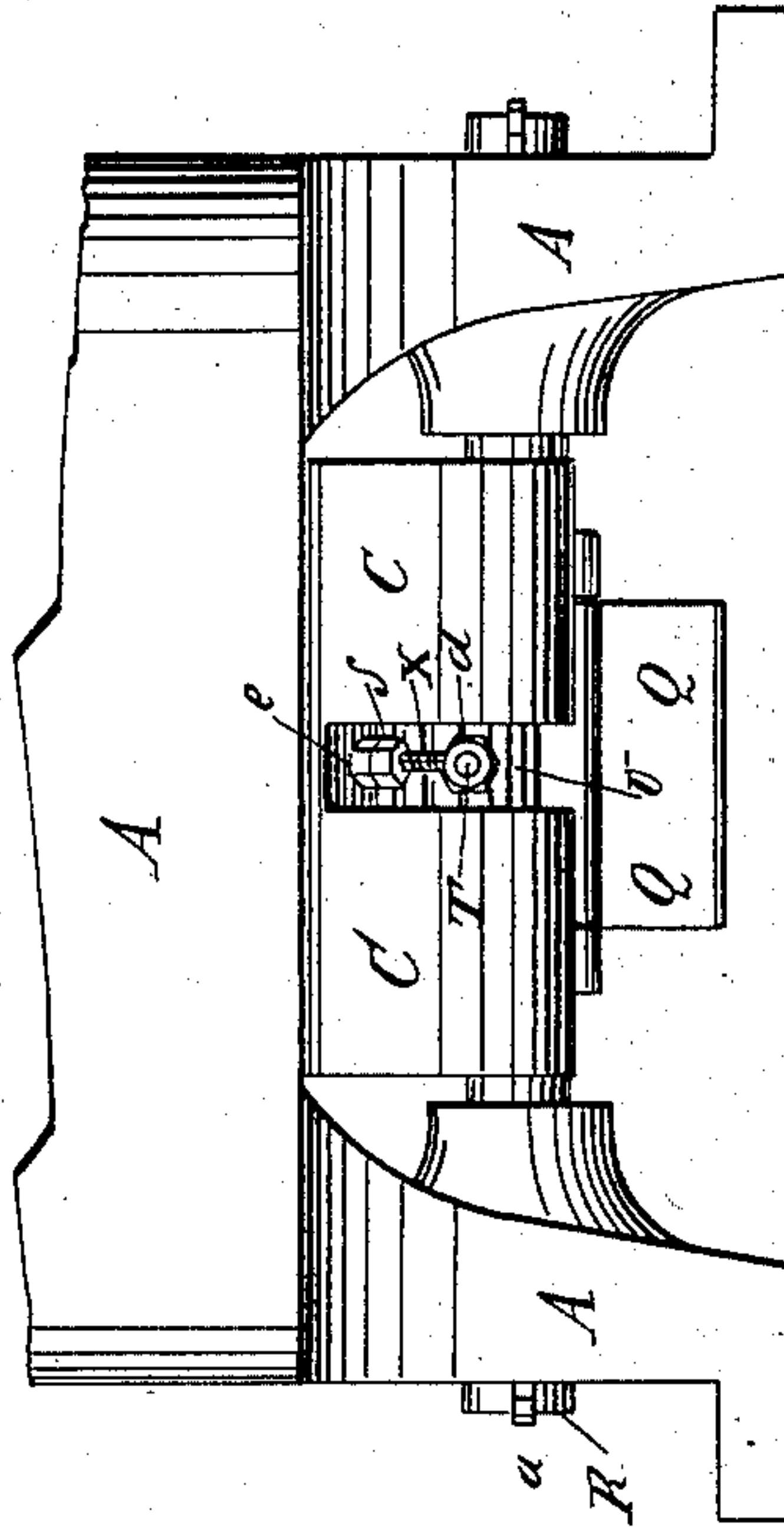
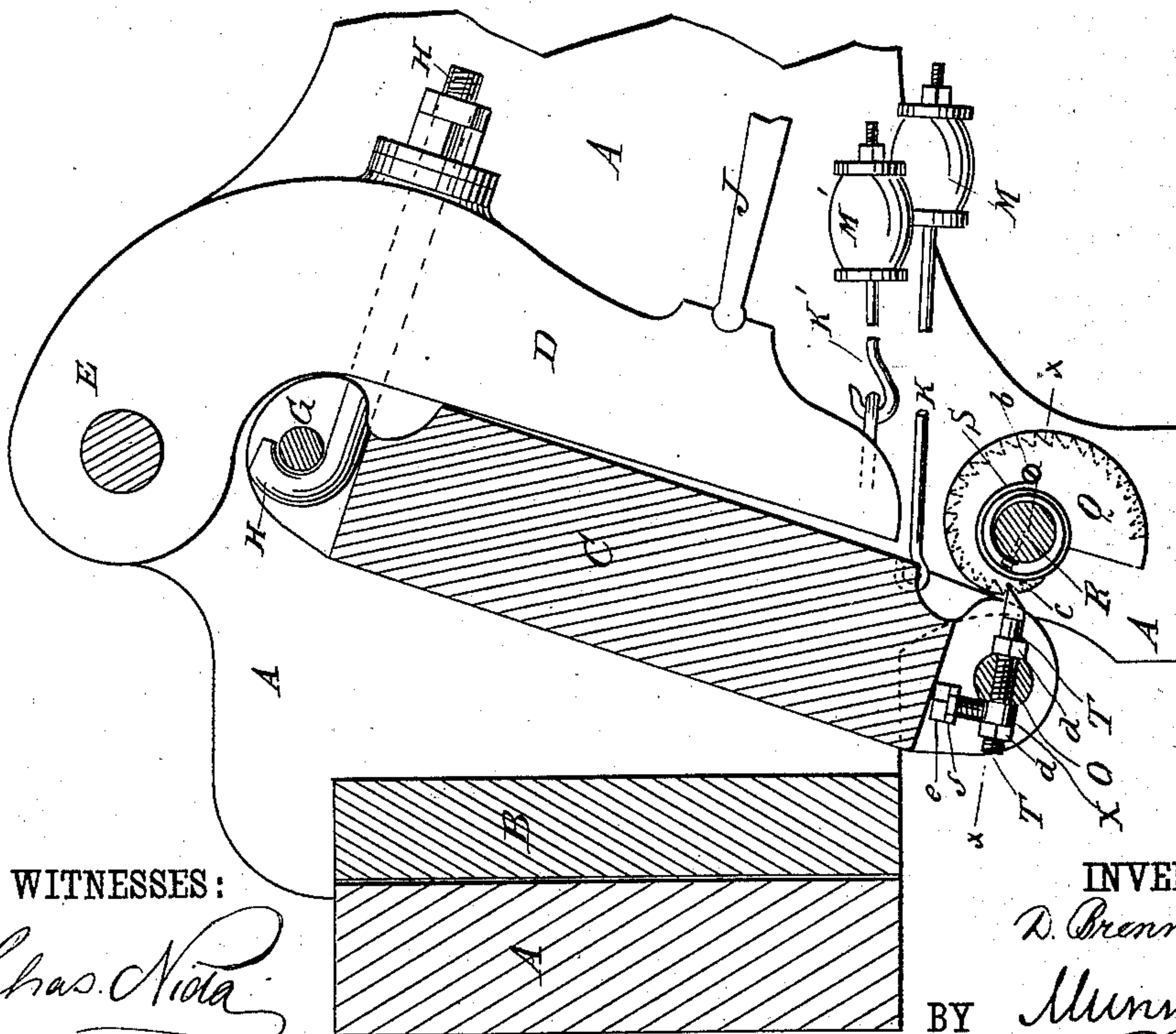


Fig. 1.



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(No Model.)

2 Sheets—Sheet 2.

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Fig. 6.

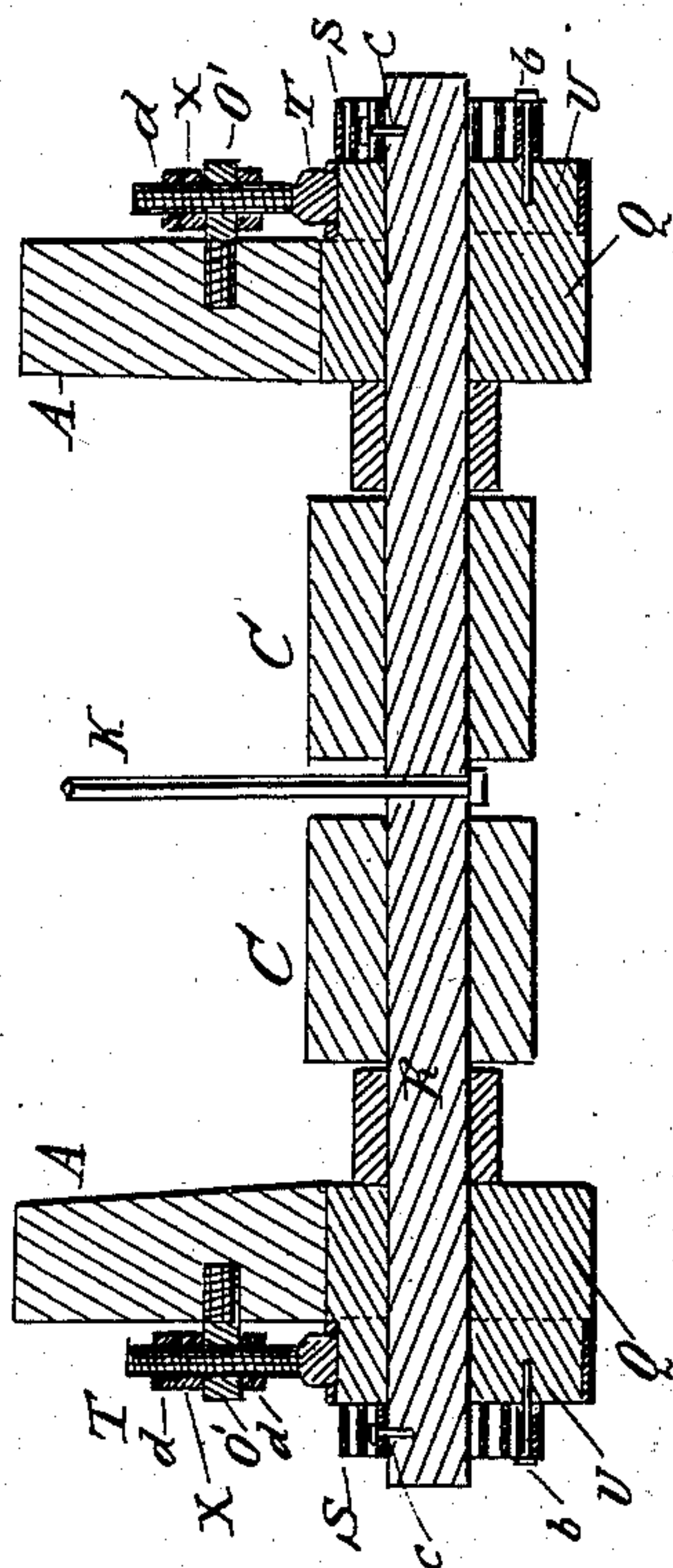


Fig. 5.

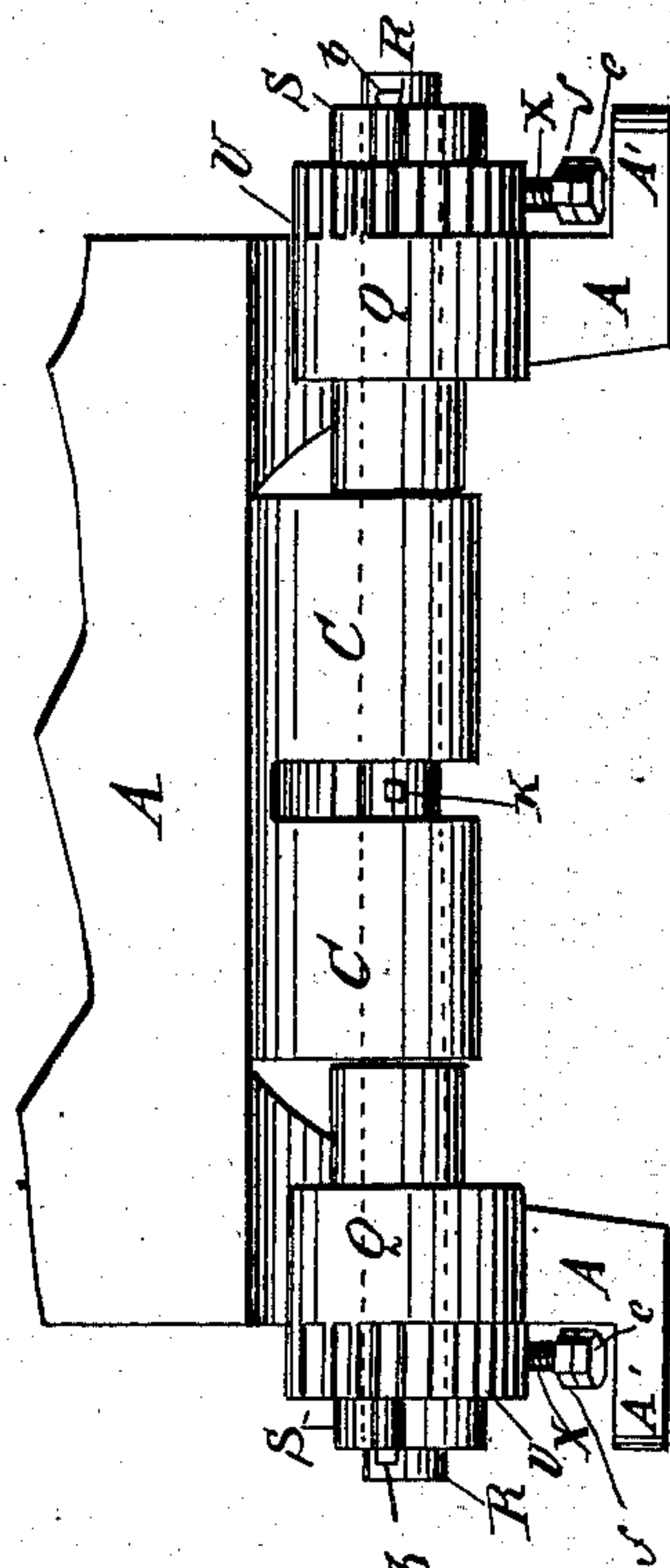
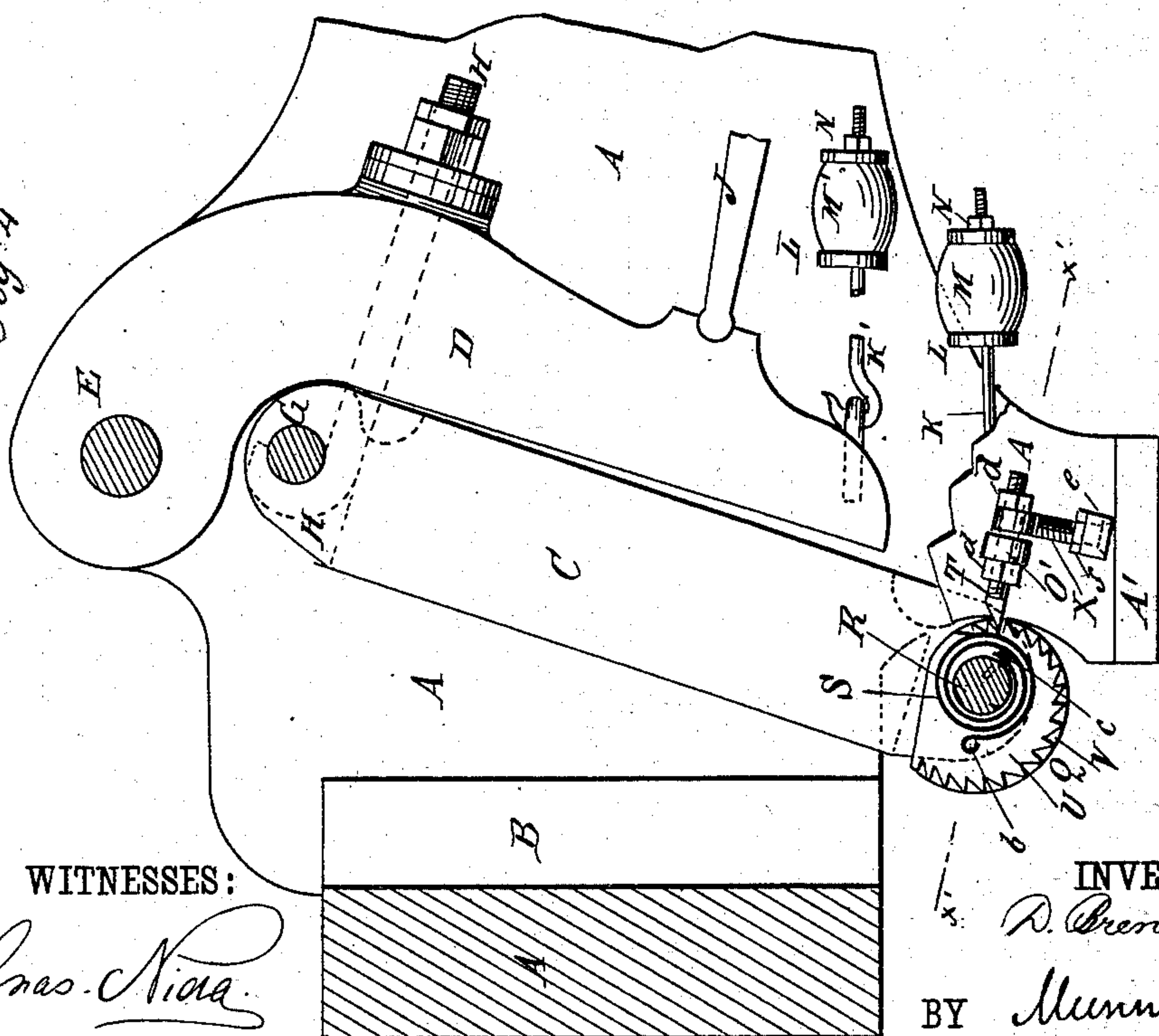


Fig. 4.



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UNITED STATES PATENT OFFICE.

DANIEL BRENNAN, JR., OF BAYONNE, (SALTERSVILLE P. O.,) NEW JERSEY.

STONE AND ORE CRUSHER.

SPECIFICATION forming part of Letters Patent No. 315,468, dated April 14, 1885.

Application filed November 7, 1884. (No model.)

To all whom it may concern:

Be it known that I, DANIEL BRENNAN, Jr., of Bayonne, (Saltersville P. O.,) in the county of Hudson and State of New Jersey, have invented a new and useful Improvement in Stone and Ore Crushers, 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 the forward part of a stone and ore crusher to which my improvement has been applied. Fig. 2, Sheet 1, is a front elevation of the lower part of the same. Fig. 3, Sheet 1, is a sectional plan view of the lower part of the same, taken through the line *xx*, Fig. 1. Fig. 4, Sheet 2, is a side elevation, partly in section and part being broken away, of the forward part of a stone and ore crusher, showing a modification in the arrangement of my improvement. Fig. 5, Sheet 2, is a front elevation of the lower part of the same. Fig. 6, Sheet 2, is a sectional plan view of the lower part of the same, taken through the line *x' x'*, Fig. 4.

In stone and ore crushers the motion or thrust of the lower ends of the movable jaws should not exceed a fixed amount proportioned to the size of the uniform product required, for the reason that, however close the jaws may approach each other on the forward or crushing stroke, the size of the product will depend upon the distance to which the movable jaw recedes, and the uniformity of the product will depend upon the said distance being kept always the same.

The object of this invention is to provide stone and ore crushers constructed in such a manner that the lower ends of the movable jaws can be readily adjusted to have more or less movement, and when adjusted will be prevented from exceeding the fixed limit.

The invention relates to stone and ore crushers constructed with the frame and the lower end of the forward part of the movable jaw connected by a cam or cams having a toothed section, and provided with a coiled spring or springs arranged to turn the said cam or cams forward, and an adjustable pawl, whereby the

movement of the said lower end of the forward part of the movable jaw will be limited. The adjustable pawl is provided with an eyebolt having a screw-sleeve locked in place by a jam-nut, whereby the said pawl will be held from being swung back by the pressure of the spring, as will be hereinafter fully described and then claimed.

A represents the frame, and B the stationary jaw of an ordinary stone and ore crusher. The movable jaw of the crusher is made in two parts, C D, the rear part, D, of which is hinged at its upper end to the upper part of the frame A by the pin E. The forward part, C, of the movable jaw is hinged at its upper end to the rear part, D, near its upper end by the pin G and the hook-bolt H. The forward part, C, of the movable jaw is thrust forward toward the stationary jaw B to crush intervening material by the forward movement of the rear part, D, which is forced forward by the toggle-bar J, operated by the ordinary mechanism used in stone and ore crushers for that purpose. In the arrangement shown in Figs. 1, 2, and 3, as the parts C D of the movable jaw are drawn back, after making a stroke, by the rods K K' and the springs M M', the rear part, D, can follow the bearings of the actuating mechanism; but the rearward movement of the lower end of the forward part, C, is arrested and limited by the said lower end coming in contact with the cam Q, carried by the shaft R, which passes through the said cam, and through the sides of the frame A, and is kept from turning in the said frames by the keys *a*. The cam Q is provided with a toothed section, U, formed upon or attached to it, and is connected with the shaft R by a coiled spring, S, the outer end of which is secured to the said cam Q by a screw-bolt, *b*, and its inner end is secured to the said shaft R by a screw-bolt, *c*, the said spring S being coiled in such a manner as to revolve the cam Q, when released, forward or in such a direction as to bring its longer radius toward the forward part, C, of the movable jaw, and thus lessen the rearward movement of the said part. The cam Q is held from being turned by the spring S by the pawl T, which engages with the teeth of the section U, and the screw-threaded shank of which passes through a

transverse perforation in the flattened middle part of the pin O and through the eye of the eyebolt X, and has nuts *d* screwed upon it upon the opposite sides of the said pin and eyebolt to secure it adjustably in place. The pin O is placed in a transverse perforation in the slotted lower end of the forward part, C, of the movable jaw. With this construction, by adjusting the nuts *d* the distance to which the engaging end of the pawl T enters the space between the teeth of the toothed section U can be regulated, and consequently the amount of rearward movement allowed to the lower end of the forward part C of the movable jaw can be limited.

Upon the eyebolt X is screwed a sleeve, *e*, to serve as an adjustable extension to the said eyebolt, and which is secured in place when adjusted by the jam-nut *f*, also screwed upon the said eyebolt. The extension screw-sleeve *e* of the eyebolt X is designed to abut against the forward part, C, of the movable jaw and prevent the pawl T from turning the pin O and swinging back under the pressure of the spring S. With this construction, by adjusting the screw-sleeve *e*, the pawl T can be adjusted to enter and work squarely in the space between any two adjacent teeth of the toothed section U.

In using the improvement, the spring S is wound up, the lower end of the forward part, C, of the movable jaw is brought into contact with the cam Q, and the pawl T is so adjusted as to mesh into the spaces between the teeth of the section U for a distance equal to the maximum amount of movement to which it is desired to limit the lower end of the forward part, C, of the movable jaw. The movable jaw C D is then moved forward by operating the toggle-bar J to the end of its forward swing, and if it does not approach close enough to the stationary jaw B for the work required the said movable jaw is adjusted forward by the ordinary and well-known means used in stone and ore crushers for that purpose. In case, during the operation, the lower end of the forward part, C, of the movable jaw should be moved forward for a distance greater than that to which the pawl T enters the space between the teeth of the section U, said section and the cam Q will be released and will be revolved forward by the spring S until a tooth of a part of the said section U, having sufficient length of radius for the purpose, catches upon the said pawl T, which brings forward a part of the cam Q having a sufficient length of radius to limit the movement of the lower end of the forward part, C, of the movable jaw to the amount fixed by the previous adjustment of the said pawl T. Any subsequent setting forward of the jaw C D to take up wear or to crush the material finer will

be followed by a like action of the cam Q, toothed section U, and pawl T, so that the movement of the lower end of the forward part, C, of the movable jaw will be limited.

In the modification shown in Figs. 4, 5, and 6 the cams Q are placed upon the end parts of a shaft, R, which passes through a transverse hole in the lower end of the forward part, C, of the movable jaw, so that the said cams will come in contact with the frame A. The shaft R is kept from turning in its bearings by the spring-rod K, which passes through and is secured to the said shaft. The pawls T are adjustably secured to the frame A by the eyebolts O' and the nuts *d*, and the eyebolts X and the adjustable screw-sleeves *e*, secured to the said pawls T, abut against lugs A', formed upon the frame A.

The modification shown in Figs. 4, 5, and 6 is intended to illustrate one way of applying my invention to old machines, the construction, adjustment, and operation of the operating parts being the same in both cases.

If desired, the coiled springs S can be replaced by cords and weights as a mechanical equivalent.

The teeth of the cam-sections U and the engaging ends of the pawls T can be made finer or coarser according as the machine is to be used for finer or coarser crushing.

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

1. In a stone and ore crusher, the combination, with a frame and the forward part of a movable jaw, of a ratcheted and a spring-actuated cam, and pawl-connection between the said frame and the said lower end of the forward part of the movable jaw, substantially as herein shown and described.

2. The combination, with the frame A and the lower end of the forward part, C, of the movable jaw of a stone and ore crusher, of the cam Q, having toothed section U, the spring S, and the adjustable pawl T, substantially as herein shown and described, whereby the movement of the said lower end of the forward part of the movable jaw will be limited, as set forth.

3. The combination, with the frame A, the lower end of the forward part, C, of the movable jaw of a stone and ore crusher, the cam Q, having toothed section U, the spring S, and the adjustable pawl T, of the eyebolt X, the screw-sleeve *e*, and the jam-nut *f*, substantially as herein shown and described, whereby the said pawl will be held from being swung back by the pressure of the said spring, as set forth.

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Witnesses:

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C. SEDGWICK.