(No Model.) 2 Sheets—Sheet 1.

A. SAUNDERS.

MACHINE FOR CUTTING PIPES OR RODS.

No. 368,012. Patented Aug. 9, 1887.

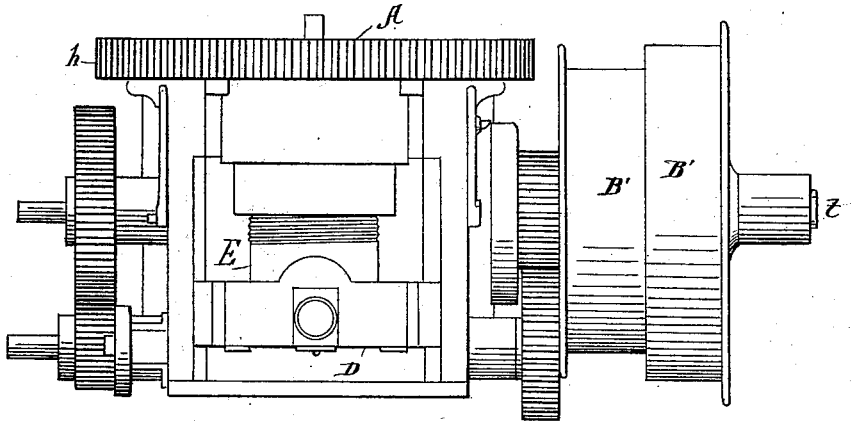


Fig. 4.

Fig. 3.

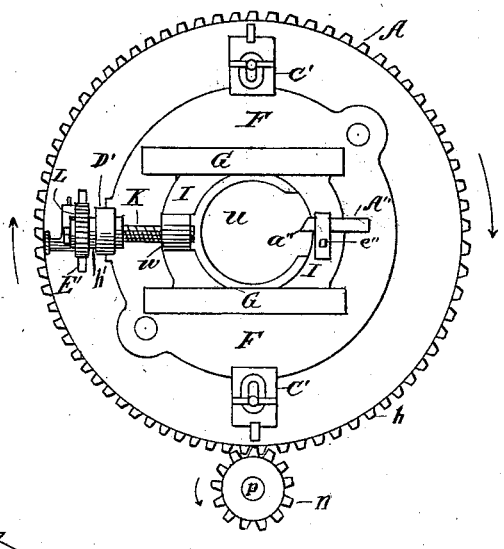


Fig. 1.

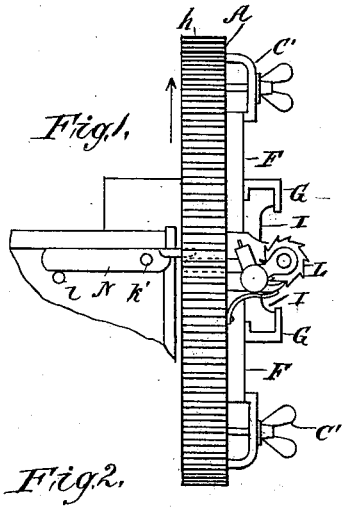
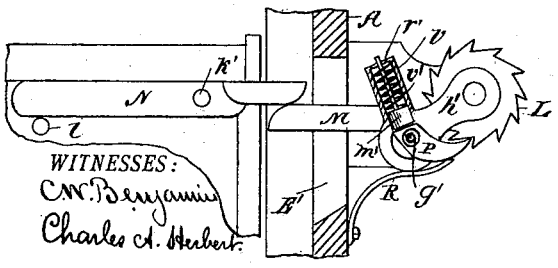


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

A. SAUNDERS.

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Fig. 5.

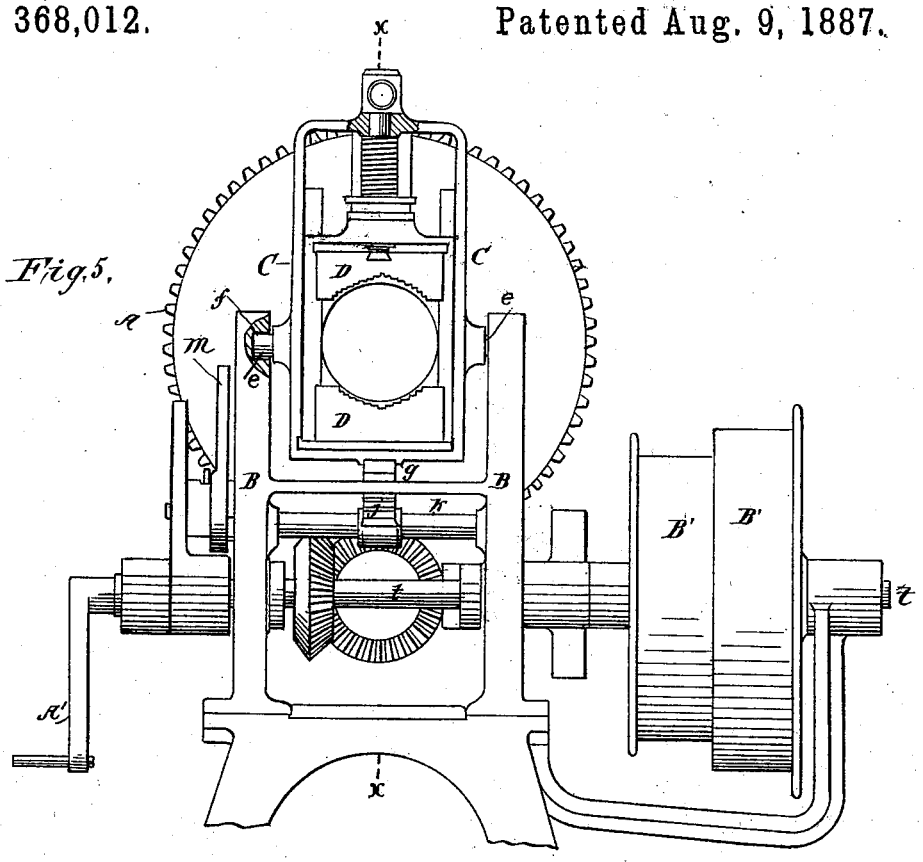
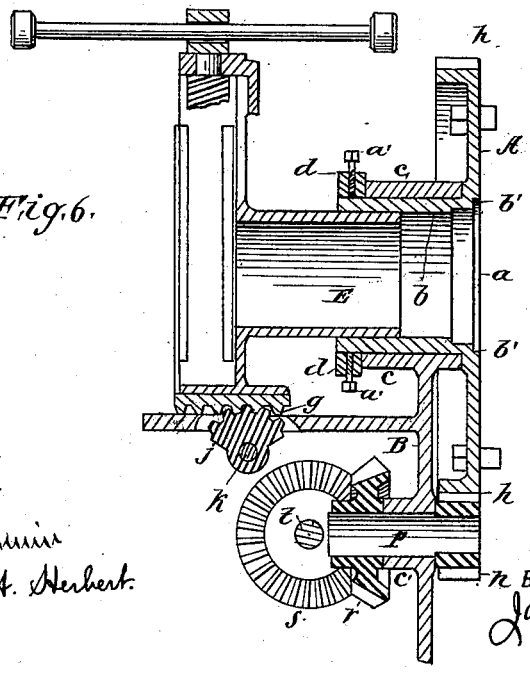


Fig. 6.



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UNITED STATES PATENT OFFICE.

ALEXANDER SAUNDERS, OF YONKERS, NEW YORK.

MACHINE FOR CUTTING PIPES OR RODS.

SPECIFICATION forming part of Letters Patent No. 368,012, dated August 9, 1887.

Application filed April 14, 1887. Serial No. 234,825. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER SAUNDERS, a citizen of the United States, residing at Yonkers, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Machines for Cutting Pipe, Cylindrical Rods, &c.; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention comprises certain novel means whereby metallic pipes, tubes, cylindrical rods, &c., may be readily severed in a transverse direction.

Said invention is more especially designed to be operated by power, but may also when desired be worked by hand.

Figure 1 is an edge view, Fig. 2 a vertical transverse sectional view, and Fig. 3 a face view, illustrating the construction and operation of my said invention. Fig. 4 is a plan view, Fig. 5 a rear view, and Fig. 6 a vertical transverse sectional view taken in the line *x x* of Fig. 5, illustrating the parts of an apparatus with which my said invention may be advantageously employed.

A is a face-plate, having a central opening, *a*, through which the pipe, tube, or cylindrical rod is fed into position to be severed, as hereinafter explained. The mechanism by which the pipe or rod is held in position and by which it is enabled to be passed to said opening *a* may be of any suitable construction; but that represented in Figs. 4 to 6, inclusive, is found to be advantageous. In this the face-plate A is formed with a cylindrical sleeve, *b*, the outer or forward end of which comprises the opening *a*. This sleeve *b* forms the journal of the face-plate A, and is supported in a bearing or journal-box, *c*, suitably fixed to or provided in the frame of the machine. In order to keep the sleeve *b* from slipping forward out of its bearing *c*, the innermost end of said sleeve projects behind said bearing, and has attached to it by means of set-screws *a'* a ring or annular shoulder, *d*. A gripping-chuck, the frame of which is shown at C and the two jaws of which are shown at D D in Fig. 5, is provided at the rearmost end of a second sleeve, E, the frame C being preferably made integral with this second sleeve E. Said sleeve E is arranged to move to and fro within the sleeve *b*, and the frame C is provided with lateral horizontal splines *e*, which work in fixed guides *f*, suitably provided upon the frame B of the machine, the said splines *e*, in conjunction with the sleeve E, supporting the frame C and the other portions of the chuck in the proper relation with the sleeve *b* of the face-plate A, and permitting the chuck to be moved inward or outward, and located at any desired distance from the opening *a* of the face-plate.

In order to move the sleeve E and the chuck D as aforesaid, the frame C is provided at bottom with a rack, *g*, into which gears a toothed sector, *j*, fixed to a rock-shaft, *k*, which is actuated on occasion by a lever, *m*, attached to the end of the rock-shaft *k*. The pipe, tube, or cylindrical rod, as the case may be, being thrust forward between the jaws D of the chuck, the latter is caused to grip the pipe, tube, or rod to be severed. These jaws may be actuated in any suitable manner to grip the article between them.

Inasmuch as, for the purpose of this my present invention, it is immaterial by what means the jaws D D are gripped upon the article or released therefrom, and as there is a wide variety of devices by which the jaws may be thus actuated, no specific description of the chuck is herein required. The article to be severed being gripped, as aforesaid, by the chuck, the latter is moved forward or backward by the means hereinbefore explained to bring the article to be severed into the exact desired relation with the cutting mechanism hereinafter described.

The opening *a* of the face-plate A is counterbored, as shown at *b'*, to receive an annulus or bushing, the internal diameter of which corresponds substantially with the diameter of the article to be severed, so that when the said article is thrust through said annulus or bushing the article will be supported against the inward thrust of the cutters. As such bushings are common for like purposes in pipe-cutting machines, it requires no special description here. It will be observed that by the means described the article to be severed is thrust forward centrally through the open-

ing *a* and projects to the requisite extent beyond the face of the face-plate A, and is held with its axis substantially coincident with the longitudinal axis of the sleeve *b*—in other words, to the axis of motion of the face-plate A. Motion is given to the face-plate A by means of cogs, *h* upon the periphery of said face-plate. Into these cogs *h* gear the teeth of a spur-pinion, *n*, which is provided upon a shaft, *p*, supported in suitable fixed bearings *c'*, and which upon its opposite end has a beveled pinion, *r*, which gears into another beveled pinion, *s*, on a shaft, *t*, to which latter, by any suitable means or from any suitable source, power is applied—as, for example, by means of a crank, A', attached to one end of the shaft *t*—in case it be desired to rotate the face-plate by manual power or by suitable pulleys, B', on said shaft *t*.

In the operation of severing the pipe, tube, or cylindrical rod or other article, the direction of rotation is such that the cutting-edge *a''* of the cutter A'' will duly act upon the article and be carried or revolved around the same, as hereinafter explained.

F is a disk which, when the cutting apparatus is intended to be detachable from the face-plate A, is formed separate therefrom, but which may, if desired, be substituted by the face-plate itself in case it is not desired to detach the cutting devices from the machine—as, for example, when the machine is desired to be employed for some other purpose. The disk F, when detachable as aforesaid, is clamped upon the face-plate by the clamping devices C', of any suitable kind—such, for example, as are frequently employed in clamping articles to be turned upon the face-plate of a lathe.

The disk F has a central opening, *u*, which, when the disk is in position, as described, is substantially coincident with the opening *a* of the face-plate, and which is of sufficient size to enable the article to be severed to be passed therethrough. Placed upon the disk F, at opposite sides of the opening *u*, are guides G, which support and guide a slide, I, in which is an opening corresponding and coincident with the opening *u* of the disk F. At one end of this slide I, and with its cutting-edge *a''* extending to the requisite extent into the opening thereof, is the cutter A'', which is secured to the slide I by a dog, *e''*, or other suitable device. In that end of the slide I opposite that at which the cutter A'' is placed is a nut, *w*, within and through which works a screw, K, the cylindrical shank of which is placed within a bearing, D'. It will be observed that by turning the screw K in one direction or the other the said screw, in conjunction with the nut *w*, will move the slide I inward or outward, as the case may be.

Pivoted upon the outer end of the screw K is a bar, M, which may be most conveniently attached to the said screw by having its inner end, *h'*, forked and placed astride of the ratchet-wheel L. This bar M passes through a suitable slot, E', in the face-plate A, and projects beyond the inner or rear surface of said face-plate, as more fully illustrated in Fig. 2. Pivoted, as shown at *k'*, to an adjacent portion of the frame of the machine or other suitable fixed support is a swinging lever, N, under the rearmost portion of which is provided a fixed stud, *l*, so that said rearmost portion of said swinging lever N is prevented from swinging downward, and thereby prevents the forward end of said lever from swinging upward, but permits a reverse motion of said swinging lever.

Pivoted to the bar M by a suitable pivot, *g'*, is a pawl, P, the point of which plays into the ratchets of the ratchet-wheel L, while the inner end thereof is provided with two flat surfaces at substantially right angles to each other, as indicated in Fig. 2. Placed behind the pawl and secured to the bar M is a cylindrical case, *v*, within which is placed the spiral spring *v'*, which pushes down a flat-bottomed plunger, *m'*. When the flat bottom of this plunger *m'* bears against the uppermost of the flat surfaces aforesaid at the rear of the pawl P, the pressure tends to bring and retain the said pawl in gear with the ratchet-wheel L. When the said pawl is turned backward, however, so as to subject the other or lowermost of the flat surfaces to the action of the plunger *m'*, the pawl is held away out of gear with the ratchet-wheel.

The pipe, tube, or cylindrical rod, as the case may be, being placed in position, as hereinbefore described, and the pawl P being placed in gear with the ratchet-wheel L, the operation of the apparatus is as follows: The face-plate A, being rotated, carries with it the disk F, together with the parts provided to the said disk, as hereinbefore explained, the cutter A'' being revolved around the article to be severed. When, in the rotation of the face-plate, the rearmost end of the bar M is brought underneath the forward end of the swinging lever N, the said end of said swinging lever constitutes a fixed stop, which, bearing against the bar M as the latter is carried around, swings the same relatively downward around its fulcrum at the outer end of the screw K, thereby causing the pawl P to act upon the ratchet L to turn the screw K to give a longitudinal movement to the slide I, and consequently to move or feed inward the cutter A'' to the requisite extent, thereby feeding the cutter to its work at each revolution of the face-plate A. When the bar M has been swung relatively downward, as described, until it swings clear of the forward end of the lever N, it is brought back to its original position by means of a spring, R, attached to the disk F in any suitable manner, thereby bringing the pawl P behind one or more of the succeeding ratchet-teeth of the ratchet-wheel L preparatory to a repetition of the operation of feeding the cutter A'' to its work, when the bar M will again come in contact with the under side of the forward end of the swinging lever N, as described. If, for any reason, the direction of motion of

the face-plate A and of the cutting mechanism be reversed, then in that case the rearward end of the bar M will strike upon the upper instead of the under side of the forward end of the swinging lever N, whereupon the latter will tilt to enable the bar M and its adjuncts to pass without changing or affecting their position, and consequently without causing the same to act upon the ratchet-wheel L during such reverse motion of the face-plate.

As hereinbefore described, the machine is shown with but one swinging lever N, stud *l*, &c.; but any desired number of such levers, with their accompanying studs, &c., may be employed at different parts along and at a greater or less distance from the circumference of the face-plate A, with the result of giving the feeding movement to the cutter A a corresponding number of times during each revolution of the face-plate, instead of once only during each revolution, as when but one of the swinging levers N is employed.

What I claim as my invention is—

1. The combination, with a face-plate, A, of the guides G, slide I, having nut *w* and the cutter A″, screw K, working in a suitable bearing, D′, ratchet L, bar M, pawl P, swinging lever N, and stud or bolt *l*, substantially as and for the purpose herein set forth.

2. The combination, with a face-plate, A, of the disk F, guides G, slide I, having nut *w* and the cutter A″, screw K, working in a suitable bearing, D′, ratchet L, bar M, pawl P, swinging lever N, and stud or bolt *l*, substantially as and for the purpose herein set forth.

3. The combination, with a face-plate, A, of the guides G, slide I, having nut *w* and the cutter A″, screw K, working in a suitable bearing, D′, ratchet L, bar M, spring R, pawl P, swinging lever N, and stud or bolt *l*, substantially as and for the purpose herein set forth.

4. The combination, with the face-plate A, of the disk F, guides G, slide I, having nut *w* and the cutter A″, screw K, working in a suitable bearing, D′, ratchet L, bar M, spring R, pawl P, swinging lever N, and stud or bolt *l*, substantially as and for the purpose herein set forth.

5. The combination, with the face-plate A, of the guides G, slide I, having nut *w* and the cutter A″, screw K, working in a suitable bearing, D′, ratchet L, bar M, pawl P, swinging lever N, stud or bolt *l*, case *v*, spring *v′*, and plunger *m′*, substantially as and for the purpose herein set forth.

6. The combination, with a face-plate, A, of the disk F, guides G, slide I, having nut *w* and the cutter A″, screw K, working in a suitable bearing, D′, ratchet L, bar M, pawl P, swinging lever N, stud or bolt *l*, case *v*, spring *v′*, and plunger *m′*, substantially as and for the purpose herein set forth.

7. The combination, with a face-plate, A, having circumferential cogs *h* and gearing for rotating said face-plate, of the guides G, slide I, having nut *w* and the cutter A″, screw K, working in a suitable bearing, D′, ratchet L, bar M, pawl P, swinging lever N, and stud or bolt *l*, substantially as and for the purpose herein set forth.

8. The combination, with a face-plate, A, having circumferential cogs *h* and gearing for rotating said face-plate, of the disk F, guides G, slide I, having nut *w* and the cutter A″, screw K, working in a suitable bearing, D′, ratchet L, bar M, pawl P, swinging lever N, and stud or bolt *l*, substantially as and for the purpose herein set forth.

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