

WILLIAM H. DOWNING.
 Improvement in Devices for Cutting off Tubes.
 No. 126,137. Patented April 30, 1872.

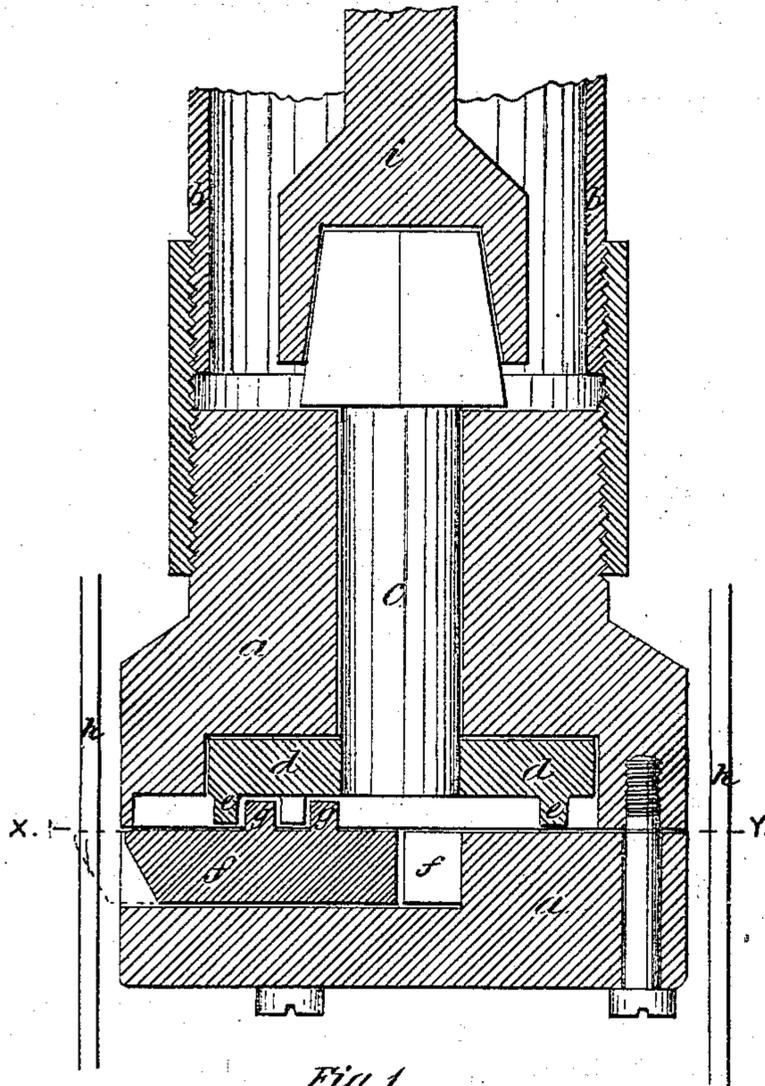


Fig. 1.

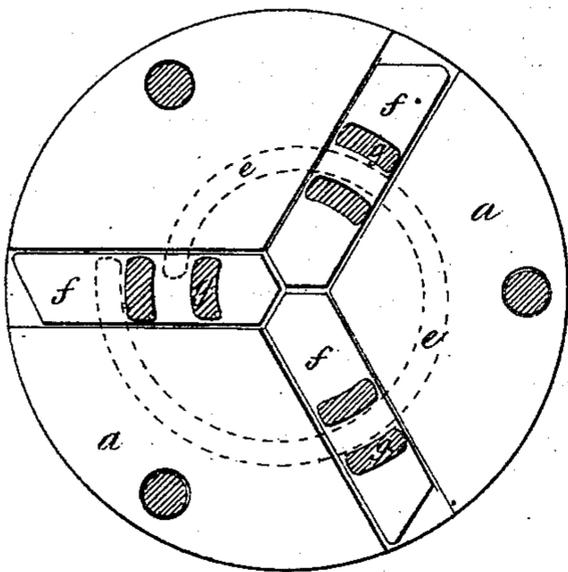


Fig. 2.

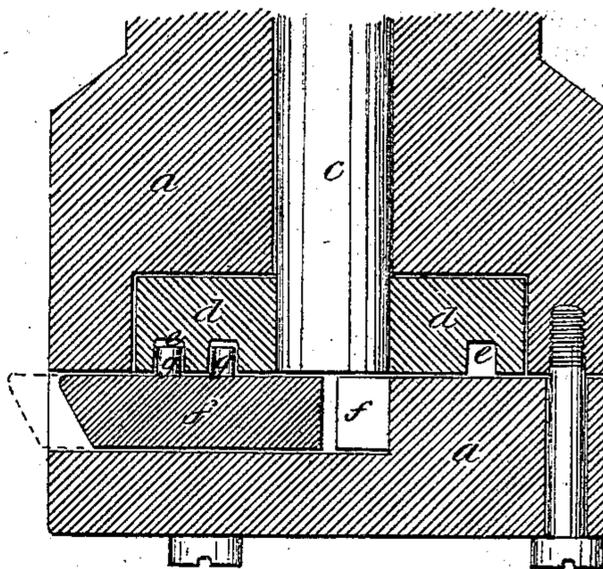


Fig. 3.

E. B. Furr
 J. H. Beach } Witnesses.

William H. Downing,
 Inventor.
 by A. B. Howland,
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UNITED STATES PATENT OFFICE.

WILLIAM H. DOWNING, OF SHAMBURG, PENNSYLVANIA, ASSIGNOR OF ONE-HALF OF HIS RIGHT TO BENJAMIN MASSETH, OF SAME PLACE.

IMPROVEMENT IN DEVICES FOR CUTTING OFF TUBES.

Specification forming part of Letters Patent No. 126,137, dated April 30, 1872.

SPECIFICATION.

Specification describing certain Improvements in Devices for Cutting off Tubes, invented by WILLIAM H. DOWNING, of Shamburg, in the county of Venango and State of Pennsylvania.

My invention relates to the class of devices used for cutting off and removing the outer tubing or casing in artesian wells, when such cutting and removal becomes necessary by reason of the casing being wedged or fast within the well.

Figure 1 is a vertical section of my improved device. Fig. 2 is a horizontal section thereof taken on line *xy* of Fig. 1. Fig. 3 is a vertical section of a portion of the device, showing a slightly different mode of construction, but operating in a similar manner to that shown in Figs. 1 and 2.

a is the frame or body within which the cutters and mechanism for feeding them are placed. A screw-thread is cut upon its upper end so that it can be attached to the tubing *b*, and lowered with it into the well. *c* is a vertical spindle passing through the central upper portion of the body *a*. Said spindle is provided with a square head at its upper end, and upon its lower end and within the body *a*, is secured a disk, *d*. A projecting spiral rib or worm, *e*, is formed or secured upon the lower face of said disk, substantially of the form shown in dotted lines in Fig. 1. *f f* are horizontal cutters moving radially outward, and beyond the outer surface of the body *a*. Teeth or pins *g g g* are formed upon the upper surface of each cutter, so placed as to embrace the worm *e*, as shown. *h* represents a section of the casing or tube upon which the tool is to be used.

When ready for use the tool is screwed upon and lowered into the well by means of the ordinary well-tubing *b*, until it reaches the desired point. The tubing is then supported by clamps at the top of the well, and a rod or string of rods, *i*, having a square socket at its lower end, is lowered within the tubing *b* until its socket passes over the square head of the spindle *c*, when the operation of the device is as follows: By turning the rod *i*, and with it the spindle *c* and disk *d*, the worm *e*

acts as a cam upon the teeth or pins *g*, on the cutters, and moves or feeds the latter outward as fast or as far as is desirable. When they come in contact with the casing *h*, the tube *b* is rotated to the right, carrying with it the cutting-tool. As the cutting progresses the cutters are fed outward by turning the rod *i*, until the casing is cut through, when the weight of the latter is borne by and upon the projecting ends of the cutters. The rod *i* may then be withdrawn from the tube *b*, and the latter, with the cutting-tool and casing *h*, may be drawn out of the well. A reverse rotation of the spindle *c* withdraws the cutters, and the whole is under the ready manipulation of an operator at the top of the well.

The arrangement shown in Fig. 3, varies slightly in construction from the above, but operates in a precisely similar manner. Instead of the spiral-rib or worm, shown on the disk *d*, in Fig. 1, a spiral groove is cut in the face of the disk corresponding in form or plan with that of the projecting worm, and each of the cutters has upon its upper face a pin, working within the groove, the whole giving precisely the same cam movement shown in the former arrangement.

Similar letters on the drawing represent parts performing similar functions.

If desirable, a separate worm or groove can be cut upon the disk *d* for each cutter, so that a one-third revolution of the latter will suffice to feed the cutters as far out as is necessary; but it is believed that a single worm or groove, of the plan shown in dotted lines in Fig. 2, requiring a complete revolution of the disk, will, by giving a slower motion prove the most advantageous.

I claim as my invention—

The described arrangement and combination of the spindle *c*, disk *d* with its spiral worm or groove *e*, and cutters *g g g*, with their projections or pins *h h h*, the whole being secured within the body *a*, and operated by means of the tube *b* and rod *i*, substantially as and for the purposes set forth.

WILLIAM H. DOWNING.

Witnesses:

B. FORDONSKI,
HARRIS MICHLISKY.