May 15, 1928. 1,669,911

H. W. OSTER ET AL

MACHINE FOR CUTTING OFF PIPES AND THE LIKE

Filed Sept. 15, 1925 2 Sheets-Sheet 1

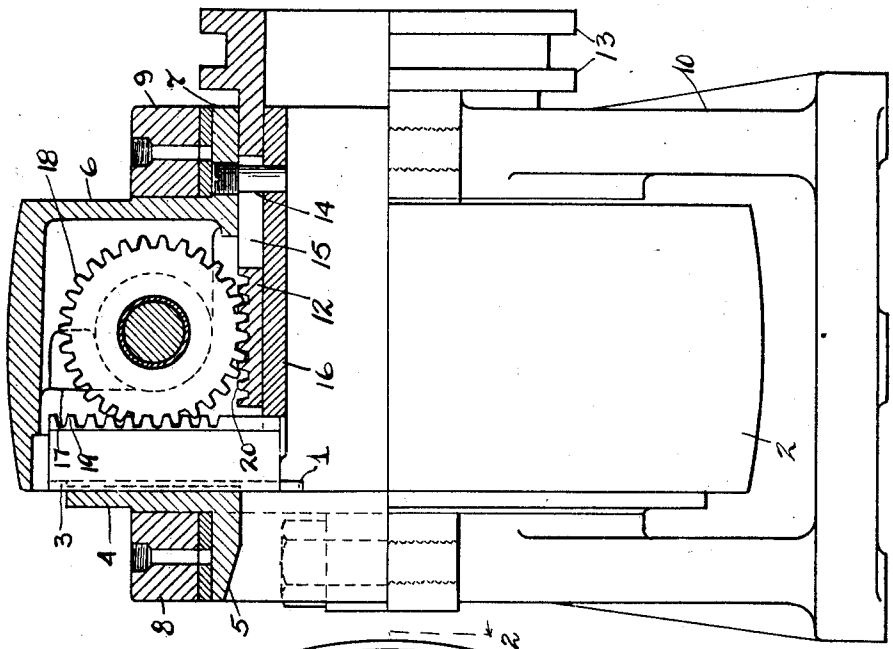


Fig. 2

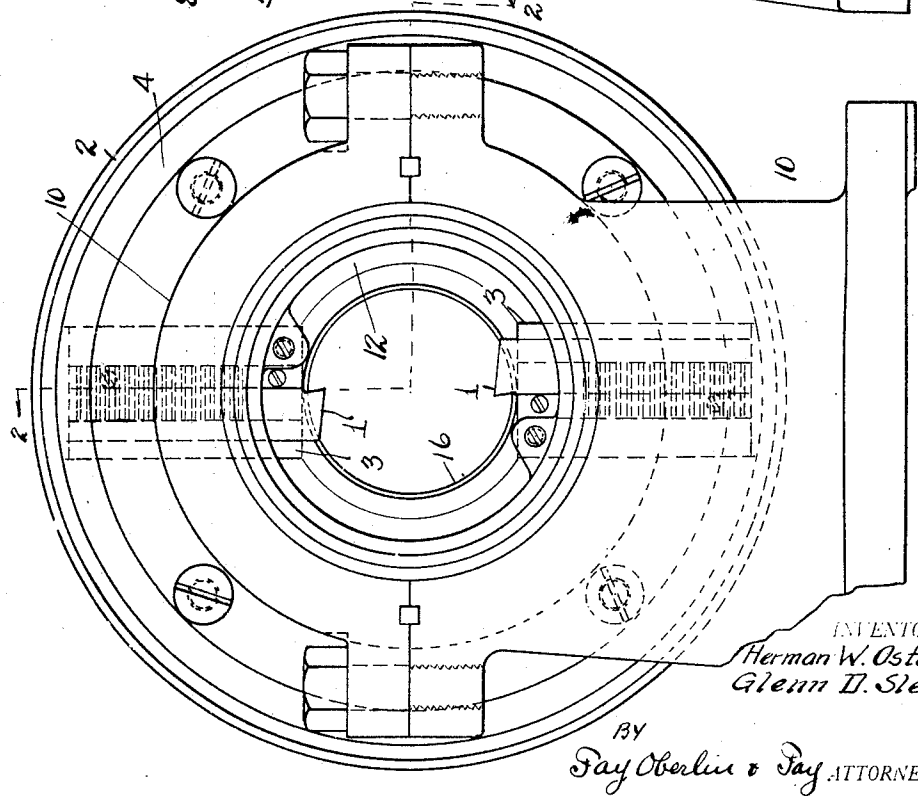


Fig. 1

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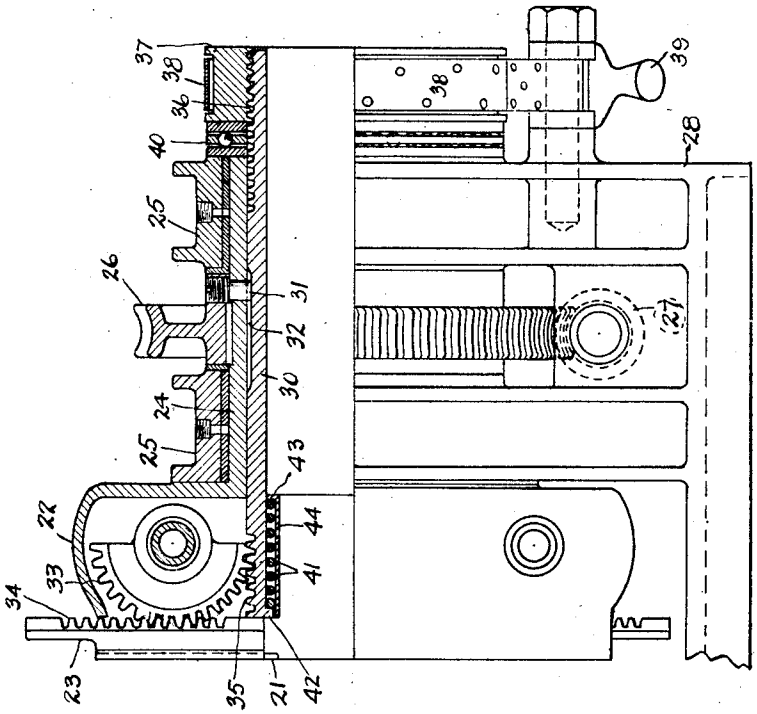


Fig. 4

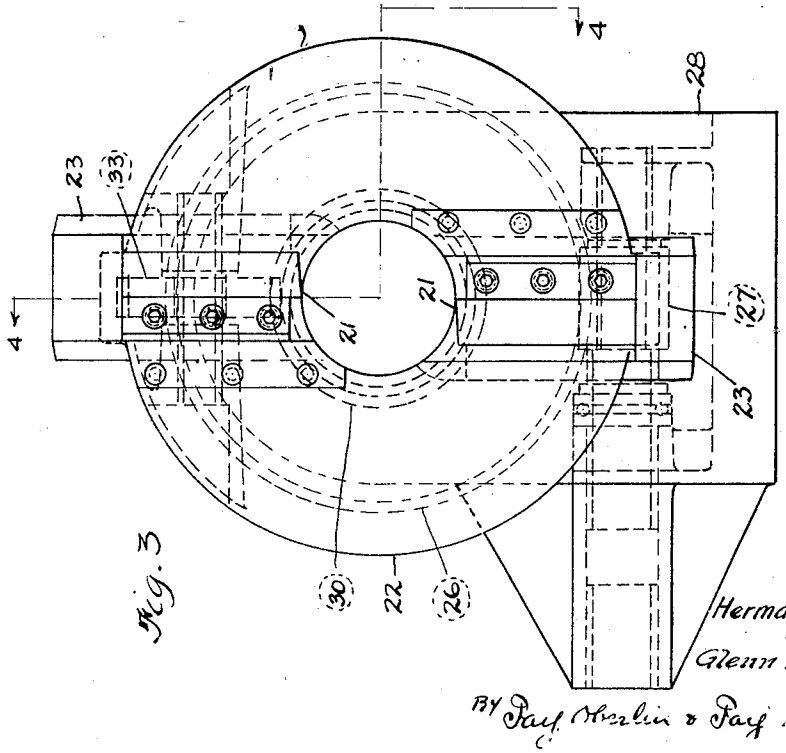


Fig. 3

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Patented May 15, 1928. 1,669,911

UNITED STATES PATENT OFFICE.

HERMAN W. OSTER AND GLENN D. SLEETH, OF CLEVELAND, OHIO, ASSIGNORS TO THE OSTER MANUFACTURING COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

MACHINE FOR CUTTING OFF PIPES AND THE LIKE.

Application filed September 15, 1925. Serial No. 56,469.

The present improvements relate more particularly to a power driven pipe cutting machine wherein the cutters proper are carried by a hollow head through the opening in which the length of pipe to be severed may be extended. The pipe being held against rotation, the cutters are rotated and simultaneously moved inwardly to perform the cutting operation.

The object of the present invention is to provide a machine for thus cutting off pipes and like articles which will require a minimum number of parts and be otherwise extremely simple in construction. A further object is to provide a device which may be easily operated either manually or automatically to move the cutters inwardly or outwardly, as the case may be.

To the accomplishment of the foregoing and related ends, the invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims, the annexed drawings and the following description setting forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings:—

Fig. 1 is a front elevation of one form of cutting off machine embodying our present improvements; Fig. 2 is partly a side elevation and partly a vertical central section of such machine; Fig. 3 is a view similar to Fig. 1 but showing a modification in construction; and Fig. 4 is partly a side elevation and partly a vertical central section of such modified form of the machine.

Referring first to the construction shown in Figs. 1 and 2, the two cutters 1, wherewith the machine is provided, are arranged diametrically opposite each other in a rotatable casing 2 that is formed with a coaxial bore and constitutes at the same time a pulley whereby such casing may be rotated by passing a belt (not shown) thereabout. The cutters 1 are attached to slide blocks 3 respectively, which are suitably held in radial slideways in a disk 4 that forms a detachable front wall for casing 2. Said disk is formed centrally with a tubular extension 5 that constitutes one portion of the hub of the casing, while the integral rear wall 6 of the latter is provided with a corresponding tubular extension 7 that constitutes the other hub portion, such hub portions 5 and 7 being respectively journaled in suitable bearings 8 and 9 in a stand 10 that constitutes the support for the machine.

Longitudinally slidably mounted within hub portion 7 is a sleeve 12, the outer end of which projects beyond the hub and is formed with two concentric ribs 13 that are adapted to receive the forked end of an actuating lever such as is used for shifting the movable element of a cone clutch or the like. Said sleeve is guided in its longitudinal movement relatively to the casing hub by means of a pin 14 that projects inwardly from the latter through an elongated slot 15 in the sleeve, the inner end of such pin being doweled in a shell 16 that closes off the hollow interior of the casing 2. Suitably journaled between paired brackets 17 within such casing are spur pinions 18, one for each slide block 3. The inner face of each such block is formed with rack teeth 19 that mesh with said pinions and the inwardly projecting portion of sleeve 12 is likewise formed with rack teeth 20 that mesh with the respective pinions 18.

From the foregoing construction it will follow that as the sleeve 12 is moved in or out, the pinions 18 will be oscillated to radially adjust the positions of the slide blocks 3 a corresponding amount. Sleeve 12 may obviously be thus shifted irrespective of the rotative movement of the casing 2 and thus cause the cutters 1 to be moved radially inwardly while they are cutting.

In the modified construction shown in Figs. 3 and 4, the cutters 21 are mounted as before in a casing 22 through the medium of slide blocks 23, to which such cutters are suitably attached. The casing 22, however,

does not here constitute a belt pulley and is provided with a hub 24 that projects from its one side only so as to leave the front face of the machine entirely clear. Such hub is journaled in two spaced bearings 25 so as to provide a steady support for the casing 22 as it is rotated, and for the purpose of such rotation, a worm gear 26 is keyed on the hub 24 at a point intermediate of the two bearings, said gear being driven by means of a transversely disposed worm 27 journaled in the lower portion of the frame 28 of the machine.

A sleeve 30 corresponding to sleeve 12 of the first described construction is longitudinally slidably held within the hub 24 by means of a pin 31 that enters a slot 32 in such sleeve, movement of said sleeve being communicated to the blocks 23 through the medium of segmental pinions 33 that engage with rack teeth 34 on said blocks, respectively, and with rack teeth 35 on the inner end of the sleeve.

The outer end of the sleeve which projects beyond hub 24 is formed exteriorly with a helical thread 36 of low pitch and a nut 37 is threaded thereon, while surrounding said nut is a flexible friction band 38 that may be loosened or tightened, as desired, through the medium of a lever 39 that is suitably connected to one end of said band, as will be readily understood. A thrust bearing 40 is desirably interposed between the nut 37 and the adjacent end of hub 24, while if desired any suitable form of positive stop may be utilized to prevent the nut from coming off the sleeve 30 should it show a tendency to do this.

A compression spring 41 is also shown as interposed between an inwardly directed flange 42 on the forward end of sleeve 30, the rear end of said spring pressing against a fixed shoulder 43 forming part of a shell 44 that closes off said spring from the opening through the machine. The slide blocks 23 will have a natural tendency to fly outwardly under centrifugal force when the casing 22 is revolved and this may make the employment of such spring 41 unnecessary in order to insure opening movement of the cutters. Closing movement of the latter in any event will occur whenever the friction band 38 is applied to nut 37 since this will have the effect of restraining the rotative movement of said nut and thus cause it automatically to draw the sleeve 30 to the rear, i. e. to the right hand side of Fig. 4. It will be understood that said band 38 is not applied so tightly as completely to prevent rotation of the nut, but as the cutters work inwardly on the pipe or other stock that is to be cut, they will be gradually fed inwardly by the constant pull which the nut exerts on the sleeve 30.

Other modes of applying the principle of our invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

We therefore particularly point out and distinctly claim as our invention:—

1. In a machine of the character described, the combination of a frame, a casing rotatably mounted therein having a coaxial bore, a radially adjustable cutter-carrying block in said casing, a sleeve longitudinally shiftably held in said casing, and operative connections between said sleeve and block, whereby shifting of the former serves to adjust the latter, said connections including a pinion journaled about a transverse axis in said casing and racks on said sleeve and block respectively meshing with said pinion.

2. In a machine of the character described, the combination of a frame, a casing rotatably mounted therein having a coaxial bore, a radially adjustable cutter-carrying block in said casing, a sleeve longitudinally shiftably held in said casing, and having one end projecting therebeyond, a nut threaded on such sleeve-end, friction means adapted to control rotation of said nut, and operative connections between said sleeve and block, whereby shifting of the former serves to adjust the latter.

3. In a machine of the character described, the combination of a frame, a casing having a hub projecting from one side thereof and journaled in said frame, said casing also having a coaxial bore, a worm gear mounted on said hub, a worm adapted to drive said gear, a radially adjustable cutter-carrying block in said casing, a sleeve longitudinally shiftably held in said casing, and operative connections between said sleeve and block, whereby shifting of the former serves to adjust the latter.

4. In a machine of the character described, the combination of a frame, a casing having a hub projecting from one side thereof and journaled in said frame, said casing also having a co-axial bore, a worm gear mounted on said hub, a worm adapted to drive said gear, a radially adjustable cutter-carrying block in said casing, a sleeve longitudinally shiftably held in said casing, and operative connections between said sleeve and block, whereby shifting of the former serves to adjust the latter, said connections including a pinion journaled about a transverse axis in said casing and racks on said sleeve and block respectively meshing with said pinion.

5. In a machine of the character described, the combination of a frame, a casing having a hub projecting from one side thereof and journaled in said frame, said casing also having a co-axial bore, a worm gear mounted on said hub, a worm adapted to drive said

gear, a radially adjustable cutter-carrying block in said casing, a sleeve longitudinally shiftably held in said casing and having one end projecting therebeyond, a nut threaded on such sleeve-end, friction means adapted to control rotation of said nut, and operative connections between said sleeve and block, whereby shifting of the former serves to adjust the latter.

Signed by us this 11th day of September, 1925.

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GLENN D. SLEETH.