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T. C. SMITH.

SHEARS.

APPLICATION FILED NOV. 21, 1905.

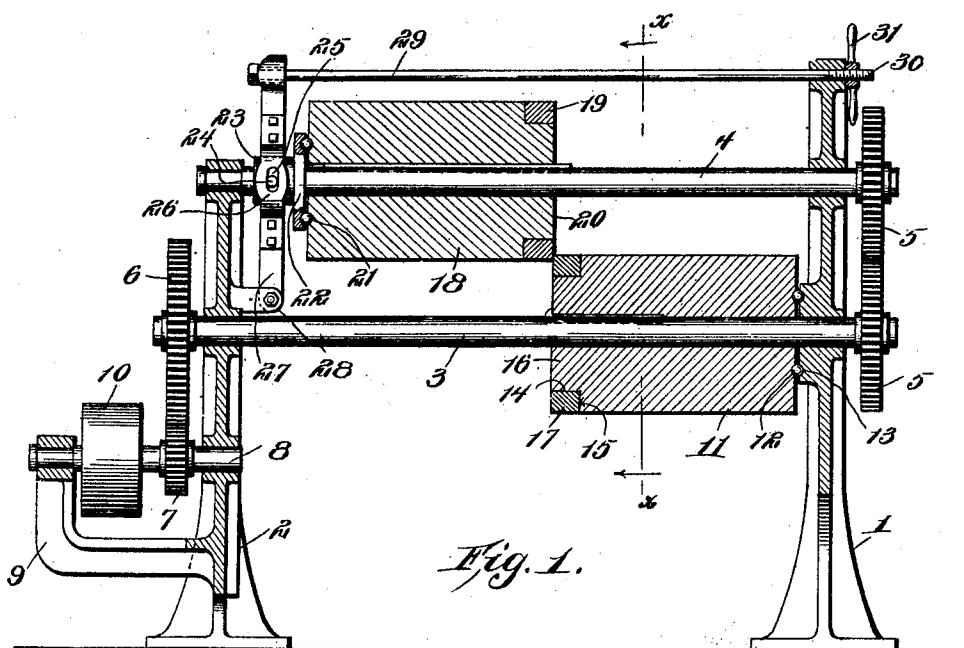
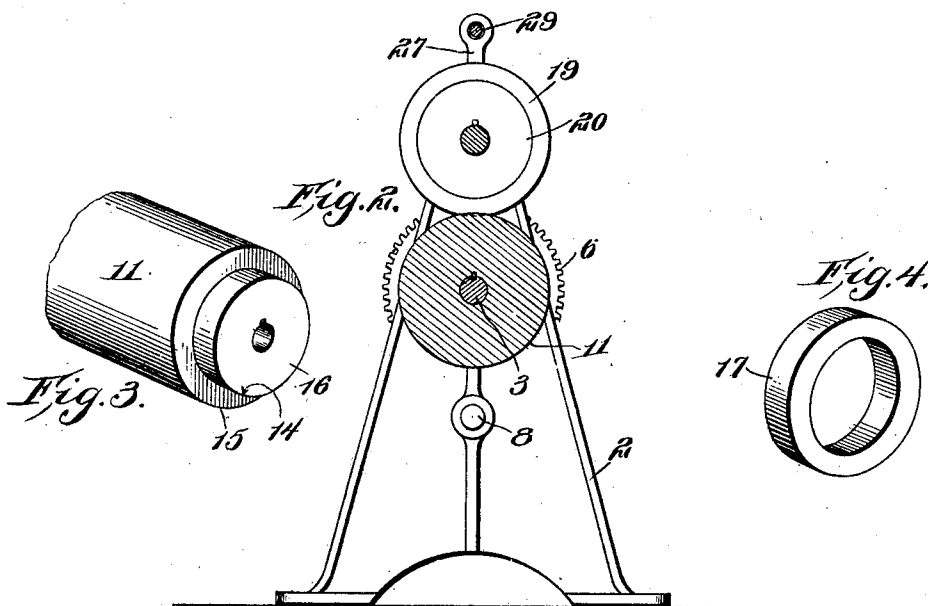


Fig. 1.



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SHEARS.

No. 827,577.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, THOMAS C. SMITH, a citizen of the United States, residing at Berkeley Springs, in the county of Morgan and State of West Virginia, have invented certain new and useful Improvements in Shears; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to rotary shears for cutting sheet metal; and its object is to provide cutting-rings each of which is supported upon one end of a heavy roll, which constitutes a backing for the ring and prevents the same from chipping or breaking during the shearing operation.

A still further object is to so mount the rings as to permit them to be ground or cut down when worn, so that practically all portions of the ring can be utilized for cutting purposes and after the same has been worn entirely away a new one can be substituted therefor.

Another object is to provide means for adjusting the cutting-rings and their rolls toward each other to compensate for the wear thereon.

With the above and other objects in view the invention consists of standards on which are mounted shafts which are driven by suitable mechanism, and on one of the shafts is keyed a roll one end of which is cut away to produce a reduced portion adapted to fit within a cutting-ring of hardened metal, the faces of said ring lying flush with the faces of the roll and all portions of the ring being backed by the roll. On the other shaft is located another roll of similar construction and which is also provided with a cutting-ring and the two rings partly overlap, so as to shear any object forced therebetween. This other roll is feathered on its shaft, and means are provided whereby it can be adjusted longitudinally so as to compensate for any wear upon the shearing-rings.

The invention also consists of certain other novel features of construction and combinations of parts, which will be hereinafter more fully described, and pointed out in the claims.

In the accompanying drawings I have shown the preferred form of my invention.

In said drawings, Figure 1 is a central vertical section through my improved machine. Fig. 2 is a section on line *x x*, Fig. 1. Fig. 3 is a perspective view of one end of one of the

rolls with the cutting-ring removed therefrom, and Fig. 4 is a perspective view of one of the cutting-rings.

Referring to the figures by numerals of reference, 1 and 2 are standards having parallel shafts 3 and 4 journaled therein, each of said shafts having a gear 5 at one end and both of said gears meshing, whereby the shafts are caused to rotate in unison. Another gear 6 is secured to the other end of shaft 3 and meshes with the small gear 7, fastened to a shaft 8, which is journaled at one end in the standard 2 and at its other end in a bracket 9, extending from said standard. This shaft has a pulley 10 upon it adapted to receive rotary motion from a belt. (Not shown.) A roll 11 is keyed on shaft 3, and one end thereof bears upon balls 12 or other suitable rotatable devices which are interposed between said roll and a race 13 formed upon the inner face of standard 1. This roll 11 has one end cut away, as at 14, to form a shoulder 15. This reduced portion 16 of the roll is adapted to fit snugly within a cutting-ring 17 of very hard material. The ring 17 when seated on the reduced portion 16 of the roll fits snugly against the shoulder 15, and as the external diameter of the ring is the same as the largest diameter of the roll it will be understood that their curved faces will lie flush at all times. Another roll 18 is feathered on shaft 4, and this roll is exactly the same in construction as roll 11 and has a cutting-ring 19 seated upon its reduced portion 20. The two cutting-rings 17 and 19 overlap slightly at the pass between the rolls, so as to insure the cutting of any article forced therebetween. Balls 21 or other rotatable devices are interposed between the roll 18 and a bearing-plate 22, which is secured to a sleeve 23, slidably mounted on shaft 4. Pins 24 extend from this sleeve into slots 25, formed within a yoke 26, which is located between the ends of a lever 27. This lever is pivoted at one end to an ear 28, extending from the standard 2, and its other end is engaged by a rod 29, having a threaded end 30, which extends loosely through the standard 1 and is engaged by an adjusting-nut 31.

It will be understood that the roll 18 is to be adjusted longitudinally by means of the nut 31 until its ring 19 contacts with the ring 17. The two rolls are then rotated through the gears 7, 6, and 5, and when a sheet of metal is fed thereto the same will be sheared at the point where the rings 17 and

19 contact. As these rings wear as a result of constant use, their cutting-faces can be ground or cut down, without, however, grinding or cutting the ends of the rolls, and in order to compensate for this reduction of the thickness in the rings the upper roll 18 should be readjusted toward the roll 11 until the rings are brought into contact, this adjustment being effected through the lever 27, rod 29, and nut 31. It will be understood that the rings can be ground or cut away and reused until practically all portions have been utilized, after which new rings can be slipped upon the reduced end of the rolls.

I attach considerable importance to the fact that the entire inner faces of the rings contact with portions of the rolls and are backed thereby, so that chipping or breaking of the rings is absolutely prevented. Any backward or longitudinal thrust upon any portion of the rings is taken up entirely by that portion of the roll in the line of pressure, and the same is true of any pressure toward the center of the rings. The rolls can be made of comparatively cheap metal and are not only valuable as backings for the rings, but also because of the added weight which they give and which greatly facilitates the shearing operation. By utilizing thrust-bearings such as shown the operation of the rolls is facilitated and the power required for rotating them is greatly reduced.

It will be seen that I have shown no means whatever for supporting material to be cut; but it will of course be understood that any desired support may be utilized, and it is not deemed necessary to show such device, as it constitutes no part of my invention.

What I claim is—

1. In a shearing apparatus, the combination with standards; of a roll mounted between said standards and having a reduced

end forming an annular shoulder, a similar roll longitudinally movable between the standards, cutting-rings seated upon the reduced ends of the rolls, a movable device connected to the longitudinally-movable roll, and means for actuating said device to move the roll longitudinally.

2. In a shearing apparatus the combination with standards, shafts rotatably mounted therein and means for transmitting rotary motion to the shafts; of a roll fixedly secured to one of the shafts and having a reduced end forming an annular shoulder, a similar roll seated upon the other shaft, cutting-rings seated upon the reduced ends of the rolls, a lever pivoted to one of the standards and connected to the feathered roll and means for swinging said lever to slide the roll upon its shaft.

3. In a shearing apparatus the combination with standards, shafts rotatably mounted therein and means for transmitting rotary motion to the shafts; of a roll fixedly secured to one of the shafts and having a reduced end forming an annular shoulder, a similar roll feathered upon the other shaft, cutting-rings seated upon the reduced ends of the rolls, a lever pivoted to one of the standards, a thrust-bearing for the feathered shaft engaged by the lever and threaded rod extending from said lever through the other standard, and means upon the rod for moving the same longitudinally to swing the lever and slide the feathered roll.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOMAS C. SMITH.

Witnesses:

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