(No Model.)

S. TRETHEWEY.

MACHINE FOR CUTTING CIRCULAR PLATES.

No. 429,072. Patented May 27, 1890.

Fig. 1.

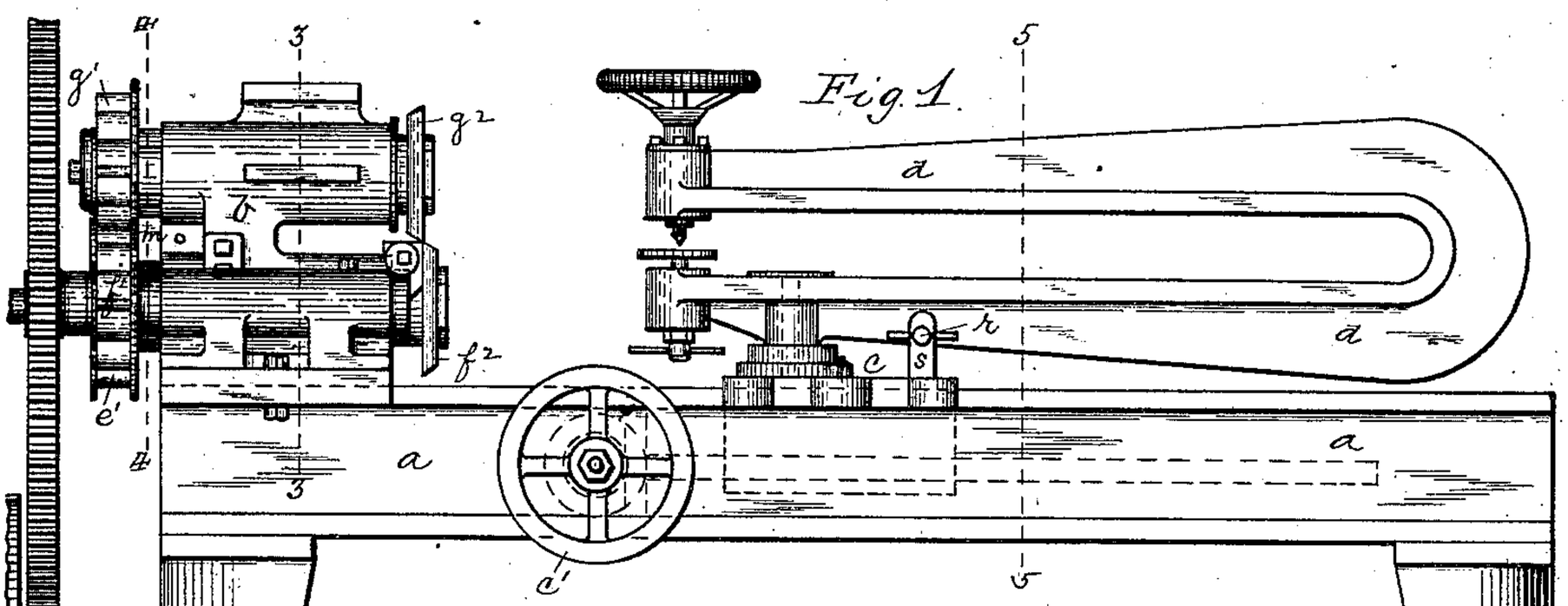


Fig. 3.

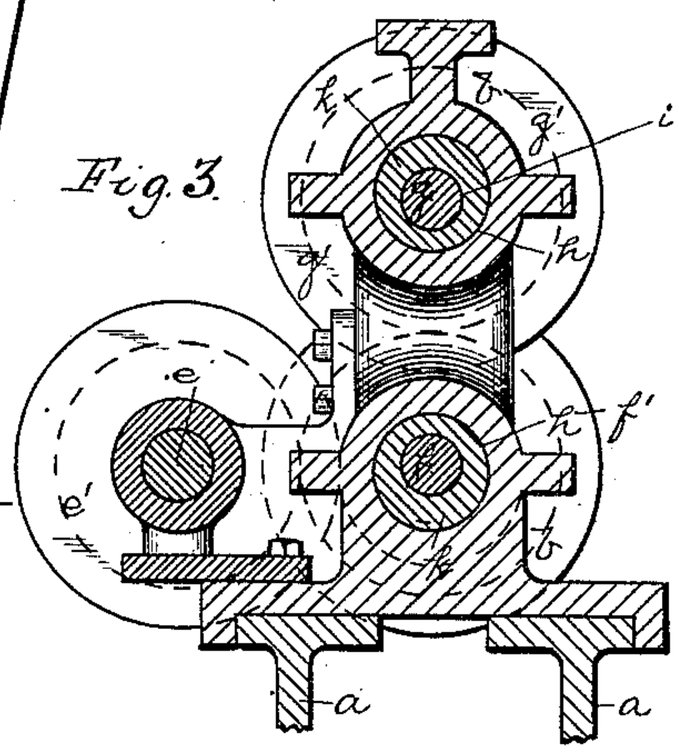


Fig. 4.

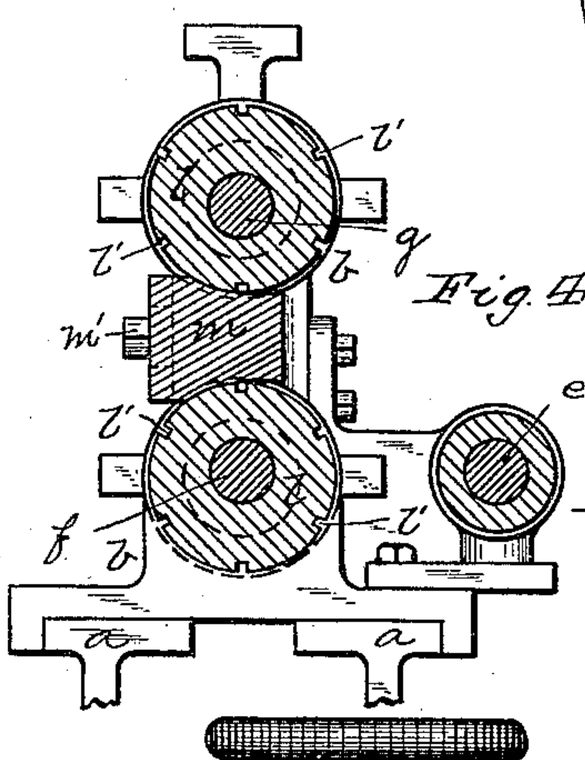


Fig. 2.

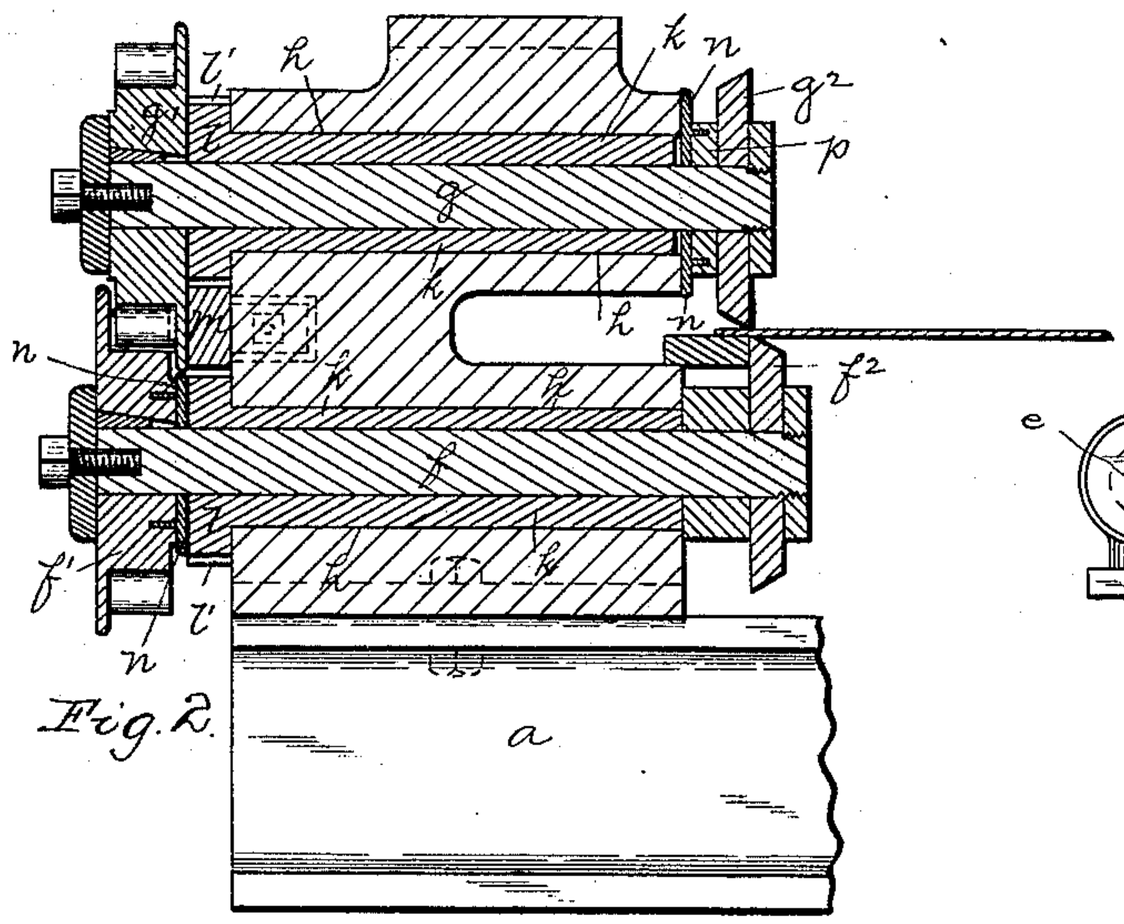
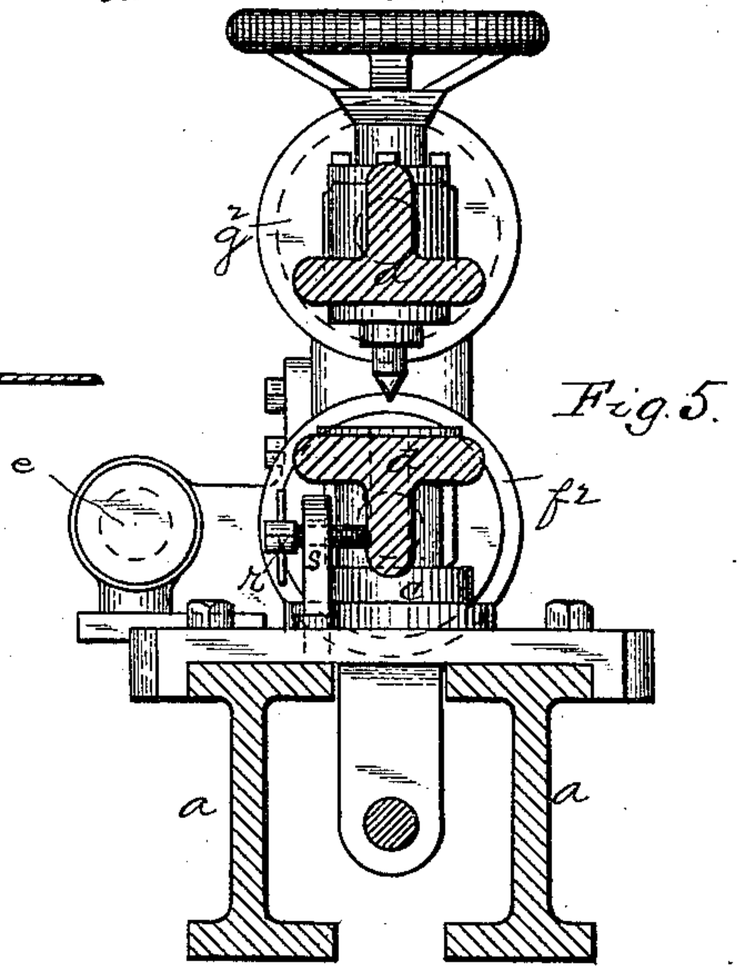


Fig. 5.



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UNITED STATES PATENT OFFICE.

SAMUEL TRETHEWEY, OF PITTSBURG, PENNSYLVANIA.

MACHINE FOR CUTTING CIRCULAR PLATES.

SPECIFICATION forming part of Letters Patent No. 429,072, dated May 27, 1890.

Application filed July 10, 1889. Serial No. 317,037. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL TRETHEWEY, a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Machines for Cutting Circular Plates; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to what are known as "rotary shears" for cutting plate metal, these shears being applicable to the cutting of either circular plates or of straight or other shaped plates, according as the metal is fed to the cutting-knives, though the shears are generally employed in connection with the cutting of circular plates.

To enable others skilled in the art to make and use my invention, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a side view of a shearing-machine embodying my invention. Fig. 2 is a longitudinal central section through the cutting-knives. Fig. 3 is a cross-section on the line 3 3, Fig. 1. Fig. 4 is a cross-section on the line 4 4, Fig. 1; and Fig. 5 is a cross-section on the line 5 5, Fig. 1.

Like letters of reference indicate like parts in each.

In the shearing-machine shown embodying my invention, *a* is the machine body or frame, having a bearing or head *b* bolted at one end thereof, and *c* the sliding block carrying the clamp *d*, said block being made adjustable in the machine-frame by any suitable means, that shown in the drawings consisting of a hand-wheel *c'*, carrying a bevel-gear engaging with a bevel-pinion at the end of a revolving screw or threaded bar passing through the block *a*, these parts being shown in dotted lines. The head *b* is generally formed of a single casting, and as heretofore constructed has had the cutter-shaft journaled directly therein, the cutter-shaft being rotated by power applied through any suitable gearing to a shaft *e*, Fig. 4, and thence through a pinion *e'* on that shaft to a pinion *f'* on the lower cutter-shaft *f*, from which power was transmitted through the pinion *g'* to the upper cutter-shaft *g*. To the cutter-shafts *f g*, respectively, are secured the rotary cutter and knives f^2 g^2.

I form through the head or frame *b* a cylindrical bearing *h*, the opening forming the bearing extending entirely through the head, as shown, and in this cylindrical bearing I place the bushing *k*, this bushing forming what might be termed an "eccentric bearing," as it has passed through it the bearing for the cutter-shaft, as at *i*, which is placed to one side of the center of said bushing, so that the cutter-shafts *f g* do not extend centrally through the cylindrical bearing *h* of the head, but eccentrically through the same. By this construction, by turning the eccentric bushings *k* the position of the cutter-shafts and the cutters in their relation to each other can be changed—as, for example, to take up wear in the cutter and so extend their life very materially, or to provide for the cutting of different thicknesses of plate. This is clearly shown in the several figures of the drawings, as it is evident that by the turning of either bushing the shafts are drawn toward or from each other, and that a very accurate and delicate adjustment of the cutting-knives can thus be obtained. At the rear ends of the bushings *k* are the flanges *l*, which are either formed with or secured to said bushings, and are either made annular or, as shown, have a series of notches *l'* therein, to provide for turning the bushings with a suitable wrench, it only being necessary where it is desired to adjust the bushings to grasp the one or the other bushing with a wrench and impart a slight turn thereto, when the position of the cutter-shaft passing through such bearing is immediately changed with relation to the other cutter-shaft. In order to hold these bushings in proper relative position during the operation of the machine, I employ a wedge-block *m*, which passes between the flanges *l* of the two bushings, and by wedging between them holds them firmly to the position to which they are adjusted, the block being forced to place by means of the bolt *m'* screwing into the head *b*, or passing through the same and held by a bolt. This block *m* has the upper and lower edges thereof curved, as shown, corresponding to the curve of the flanges with which they engage, so increasing its surface contact with the bushings, and by forcing it between said flanges *l* sufficient binding force is obtained

to hold the bushings in the position to which they have been adjusted, no matter what strain may be brought upon the cutter-shaft.

In these rotary shearing-machines it is well known that a very severe longitudinal strain is brought upon the shafts and cutters, the strain on the one shaft being in the opposite direction to that on the other, according as the knives cut into the metal. This strain causes the rapid wearing of the parts, and to overcome this I provide steel disks, which may be properly hardened so as to prevent wear, these disks being employed either with the bushings or with the shafts themselves, as shown more clearly in Fig. 2. In the one case the disk *n* is placed in front of the bearing or body of the head, and is secured to a collar *p* by pins passing from the disk *n* into the same, the disk and plate rotating with the cutter, and the plate acting to take the wear between the cutter-shaft and the ordinary bearing of the machine. In the other case, as the flange *l* of the bushing is interposed between the end of the head *b* and the rear end of the shaft, said flange *l* being held stationary during the operation of the machine, I generally secure the plate *m* by pins to the pinion *f'*, which is keyed to the shaft *f*, the plate rotating with the shaft and bearing against the flange *l*, so sustaining the end-thrusts and wear between it and the shaft.

Where the shearing-knives are adjusted, as above set forth, it is evident that in some cases—such as where either or both of the cutter-shafts turn from a vertical line passing centrally through the head—the cutting operation may be performed better where the plate to be cut is not held by the clamp with its center on the central line on the machine, but that it is desirable to adjust the center of the plate according to the position of the knives or according to the thickness of the plate to be cut. For this purpose I employ a screw-stop on the frame *a* of the machine, as at *r*, this stop passing through a suitable threaded hole formed in the projecting lug *s*, formed with or rigidly attached to the machine-frame, as shown in Figs. 1 and 5, and the screw-stop engaging with the body of the clamp, so that as the clamp is thrown around in feeding a plate to the cutting-knives it comes against this stop and is held thereby rigidly in position during the cutting operation. If, however, it is found better to slightly adjust the pivotal point of the clamp so as to cause the more even cutting operation of the shears, this can be accomplished through said screw-stop *r*, which provides for the delicate adjustment of the clamp found desirable under such circumstances.

Where a plate is to be cut, the knives are adjusted toward or from each other, as found desirable, by turning the eccentric bushings *k*, so in the manner above described causing the proper adjustment of the knives, the bushings being locked in place by the wedge-block *m*, engaging with the flanges *l*. Where the plate is circular, after marking out the circle to be formed and securing the plate in the clamp *d*, it is fed to the shears, the clamp being adjusted longitudinally through the wheel *c'* and connections to the block *c*, and in case it is found desirable to adjust the plate so as to bring the center thereof either to or away from a central line through the machine, as may be found most desirable, this is accomplished by the screw-stop *r* bearing upon the body of the flange, as fully shown in Figs. 1 and 5. During the cutting operation the strain and greatest frictional action are brought upon the hardened-steel disks *n*, which sustain such action and prevent wear, so that the wearing-powers of the apparatus are largely increased.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In rotary shears for cutting plate metal, the combination, with the machine-head, of the cylindrical bushings fitting therein and having shaft-bearings extending longitudinally through the same and eccentric to or at one side of the center of such bushings, and having the adjusting-flanges *l* at the ends of said bushings, and the wedge *m*, engaging with said flanges and holding the bushings in place, substantially as and for the purposes set forth.

2. In rotary shears for cutting plate metal, the combination, with the machine-body *a*, of the longitudinal adjusting-lock *c*, swinging clamp *d*, mounted therein, and the screw-stop *r* on the machine-frame and engaging with the clamp, substantially as and for the purposes set forth.

In testimony whereof I, the said SAMUEL TRETHEWEY, have hereunto set my hand.

SAMUEL TRETHEWEY.

Witnesses:
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ROBT. D. TOTTEN.