(No Model.)

R. HERBERS.

INSIDE PIPE CUTTER.

No. 572,203. Patented Dec. 1, 1896.

Fig. 1.

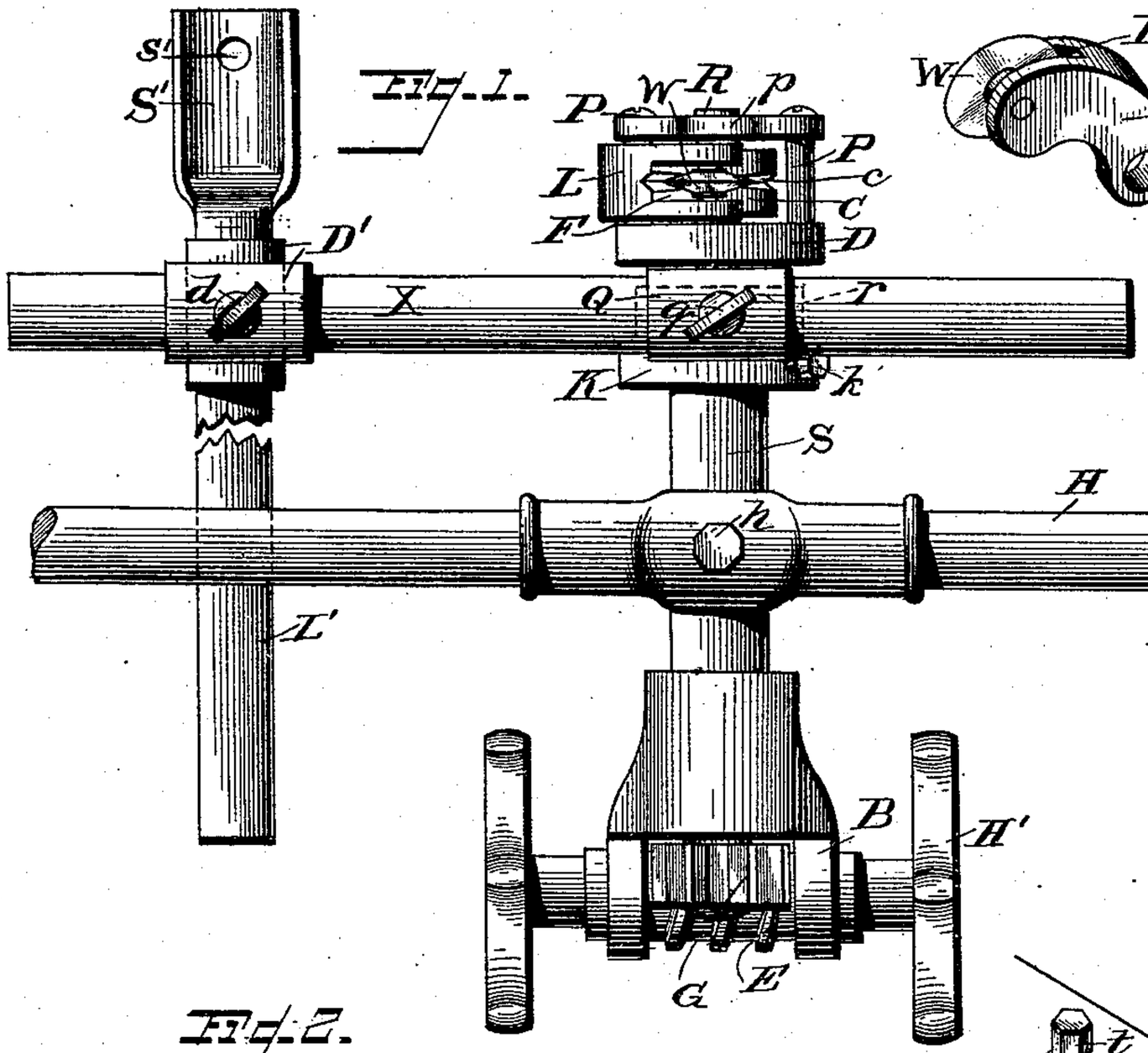
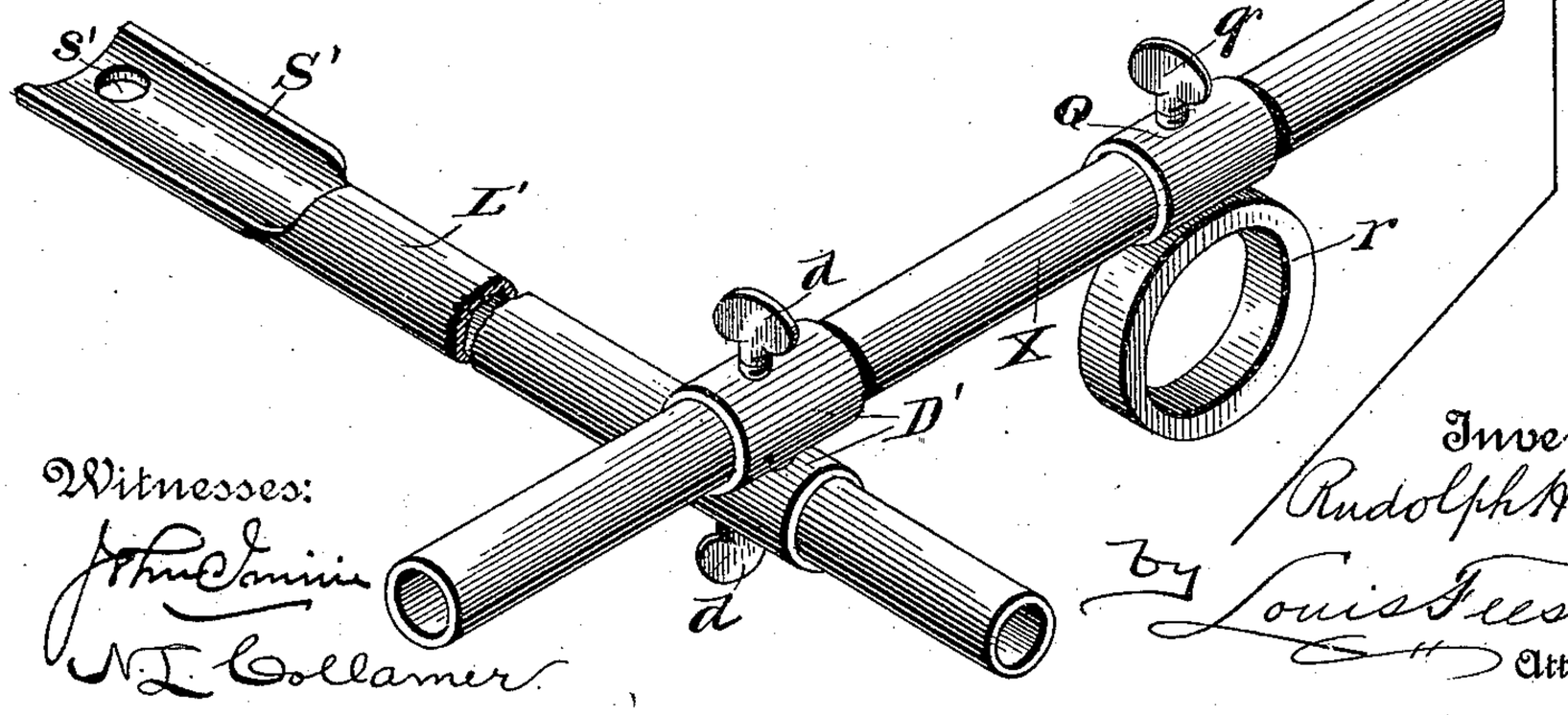


Fig. 2.

Fig. 3.



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UNITED STATES PATENT OFFICE.

RUDOLPH HERBERS, OF BEARDSLEY, MINNESOTA.

INSIDE PIPE-CUTTER.

SPECIFICATION forming part of Letters Patent No. 572,203, dated December 1, 1896.

Application filed March 30, 1896. Serial No. 585,458. (No model.)

To all whom it may concern:

Be it known that I, RUDOLPH HERBERS, a citizen of the United States, residing in Beardsley, Big Stone county, Minnesota, have invented certain new and useful Improvements in Inside Pipe-Cutters, of which the folowing is a specification.

This invention relates to metal-working tools, and more especially to that class thereof known as "pipe-cutters;" and the object of the same is to produce an improved tool for cutting the pipes or flues of a boiler from the inside outward.

To this end the invention consists in the details of construction hereinafter more fully described and claimed, and as illustrated in the drawings, wherein—

Figure 1 is a plan view of this device complete with one lever removed and shown in perspective. Fig. 2 is a front elevation thereof, illustrating the use of the triangular support, one lever being removed and the plate shown in dotted lines. Fig. 3 is a detail illustrating the two forms of support.

In the accompanying drawings the letter S designates a tubular shaft having a disk D at its front end, and H is a handle extending across this shaft and connected therewith by the set-screw *h*. From the disk D a number of pins P project outwardly parallel with its axis, and although I may use any number of such pins, I have shown but two in the accompanying drawings, these pins being connected at their outer ends by a transverse plate *p*. On each pin is pivoted near one end, beyond the disk D, a curved lever L, which is forked, as at F, at its opposite end, and journaled in said fork is the cutting-wheel W. The curvature of these levers is sufficient to permit the entrance of all the levers, their cutting-wheels, and the disk itself within the ends of the flues of a boiler, so that such flues can be cut off at points which will make them of proper length to connect with the boiler-head, as will be understood, and the handle H is for the purpose of rotating the shaft S, as will be clear.

Extending longitudinally through the shaft S is a rod R, which passes through the disk D and is journaled at its front end in the plate *p* between the pins P, and on this shaft, just inside such plate, is fixed a cam C, which when turned will throw the levers outward, and whose face is provided with grooves *c*, receiving the cutting edges of the wheels W. To the rear end of the shaft is fixed a gear G, which engages an endless screw E, the latter having its axes or shaft mounted in a bracket B, fast on the rear end of the outer shaft S, and carrying hand-wheels H′, by means of which it may be turned. Obviously when the screw is turned the gear is turned, and with the latter is turned the rod R and its cam C, and by proper manipulation of the latter the levers L are thrown outward, so that the cutting-wheels W at their outer ends are pressed tighter and tighter against the inner faces of the flues or pipes to be cut, while the handle H is used for rotating the outer shaft S, and with it these cutting-wheels, to carry them around the interior of the tube, as will be understood.

The letter K designates a collar mounted on the hollow shaft S in the rear of the disk and held adjustably thereon by means of a set-screw *k*, and the letter *r* designates a ring mounted loosely on the shaft between said collar and disk. In Fig. 2 this ring is shown as having a practically triangular body whose extremities T are turned parallel with the shaft and carry set-screws *t*, as shown. This ring is employed when my improved pipe-cutter is inserted into the end of a projecting pipe or flue, the set-screws *t* being serviceable for centering the device therein and the opening in the ring *r* permitting the free rotation of the hollow shaft S therein, while the disk D and collar K prevent longitudinal movement thereof. In Fig. 1, however, the ring *r* carries a sleeve Q, with a set-screw *q*. Through this sleeve passes a transverse rod X.

D′ is a double socket having set-screws *d*, and through one socket of which the rod X passes, and L′ is a longitudinal rod passing through the other socket and having at its front end a spoon S′, provided with the bolt-hole *s*′. Fig. 3 shows clearly both these forms of support for my improved device. In the use of the last-mentioned form the spoon S′ is bolted to a flue-expander or some kindred tool, which in turn is fastened in some flue of a boiler by means of a bolt passed through the hole *s*′. The rod L′ extends longitudinally out from such flue. The transverse rod

X stands at right angles to the longitudinal rod L′ and passes through the sleeve Q, and the latter being connected with the ring *r* forms a firm support for the cutting device and is rendered adjustable to any of the other tubes in the boiler by means of the various set-screws.

The cutter-head being passed into the proper tube or flue and to the desired depth, the hand-wheels H′ are turned to cause the cam C to throw the levers slightly outward, so that their cutting-wheels W are brought into forcible contact with the inner face of the flue, and thereafter the handle H is turned to rotate the hollow shaft and the entire device to carry these cutting-wheels around the inner face of the flue and produce a groove therein. As the wheels are thrown farther and farther from the axis of the shaft they are embedded deeper and deeper into the material of which the flue is composed, and finally the latter is severed at the proper point and the disconnected end falls out of place.

All parts of this device are of the desired sizes, shapes, proportions, and materials—preferably metal—and considerable change may be made in the specific details of construction without departing from the essential principles of my invention.

What is claimed as new is—

1. In an inside pipe-cutter, the combination with a hollow shaft having a disk at one end, pins projecting from said disk, levers pivoted at one end on said pins, and cutting-wheels carried by the other ends of the levers; of a rod extending through said shaft, a cam mounted on the rod and having grooves for the admission of the cutting edges of said wheels, means for turning this rod, and independent means for rotating said shaft, as and for the purpose set forth.

2. In an inside pipe-cutter, the combination with a hollow shaft having a disk at one end, pins projecting from said disk, levers pivoted at one end on said pins, and cutting-wheels carried by the other ends of the levers; of a rod extending through said shaft, a cam mounted on the rod, a handle fast on the shaft for rotating it, a gear on the rear end of the rod, an endless screw engaging such gear, and means for turning the gear, as and for the purpose set forth.

3. In an inside pipe-cutter, the combination with a rotatable hollow shaft having a disk at its outer end, radially-movable levers pivoted to said disk, cutting-wheels carried by said levers, and means substantially as described for throwing such levers outward; of a collar mounted on the shaft in rear of the disk, a set-screw through the collar against the shaft, a ring mounted on the shaft between said disk and collar, and means for supporting such ring, as and for the purpose set forth.

4. In an inside pipe-cutter, the combination with a rotatable hollow shaft having a disk at its outer end, radially-movable levers pivoted to said disk, cutting-wheels carried by said levers, and means substantially as described for throwing such levers outward; of a collar mounted on the shaft in rear of the disk, a set-screw through the collar against the shaft, a ring mounted on the shaft between said disk and collar and having a sleeve with a set-screw, a rod having a spoon for attachment to some other boiler-flue, a double socket into one member of which this rod passes, and a lateral rod connecting the other member with said sleeve, as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

RUDOLPH HERBERS.

Witnesses:
FERDINAND GRAUMAN,
RUDOLPH THOLEN.