(No Model.) 3 Sheets—Sheet 1.

# C. C. NEWTON.

## MACHINE FOR SAWING METAL.

No. 410,009. Patented Aug. 27, 1889.

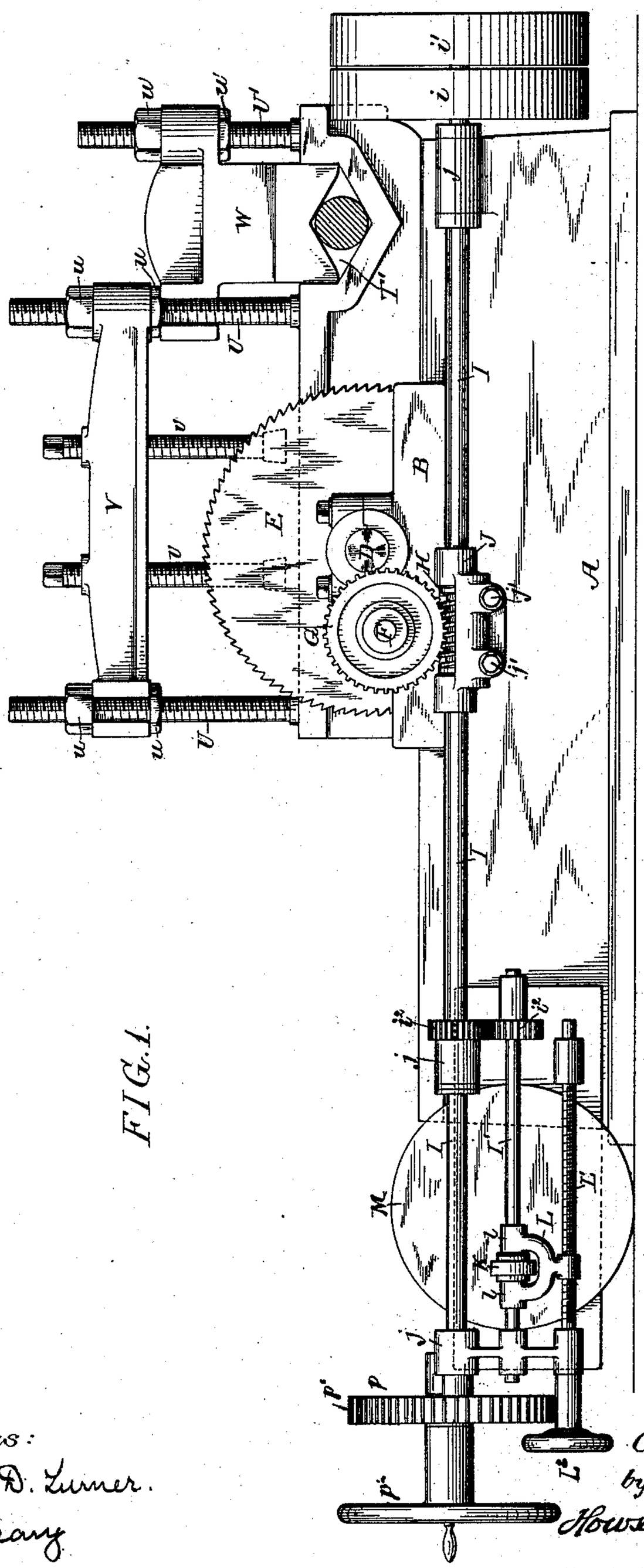

FIG. 1.

Witnesses:
Hamilton D. Turner.
John J Geary

Inventor:
Charles C. Newton
by his Attorneys
Howson & Howson

(No Model.) 3 Sheets—Sheet 2.

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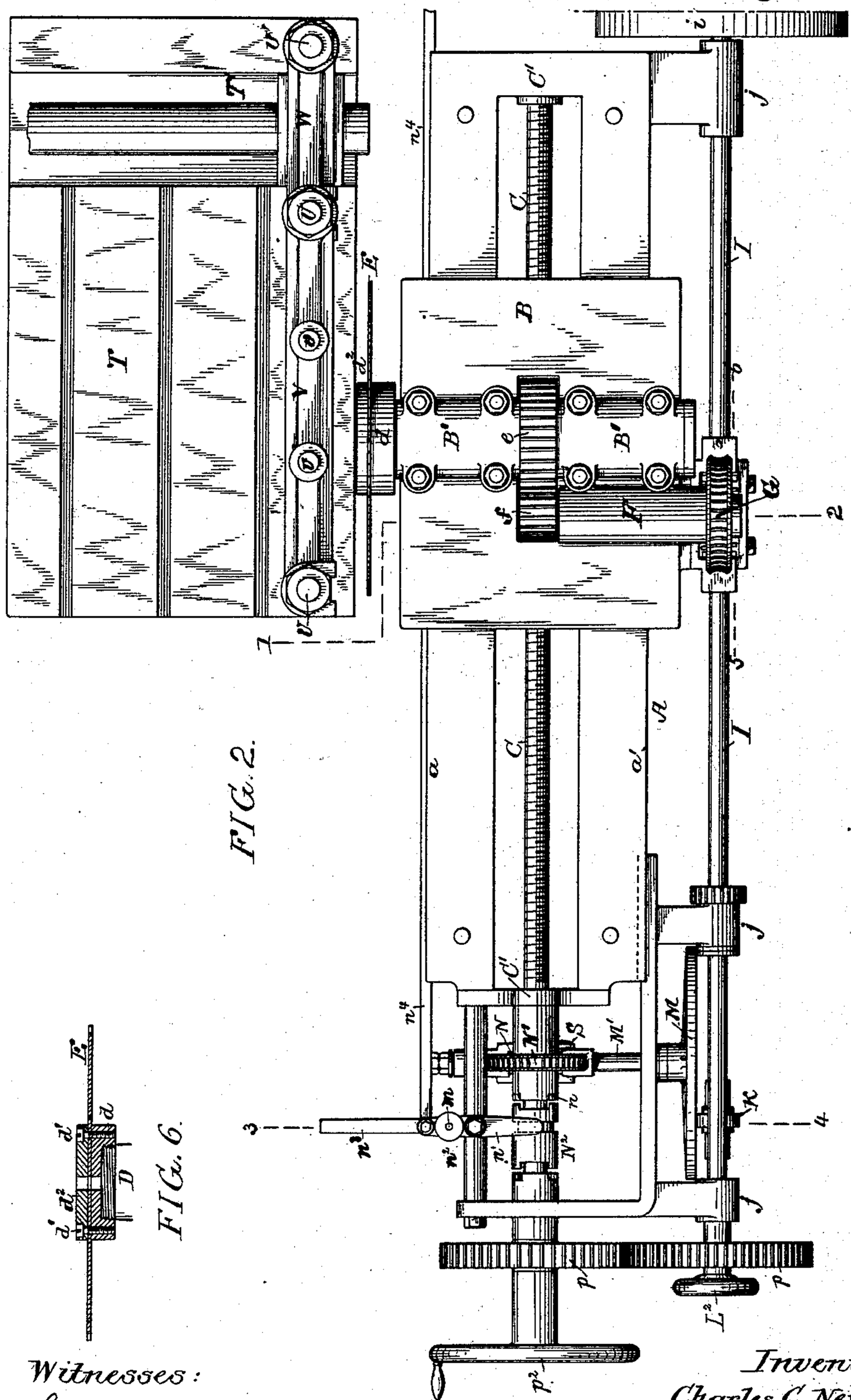

FIG. 1.



FIG. 6.

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(No Model.) 3 Sheets—Sheet 3.

# C. C. NEWTON.

## MACHINE FOR SAWING METAL.

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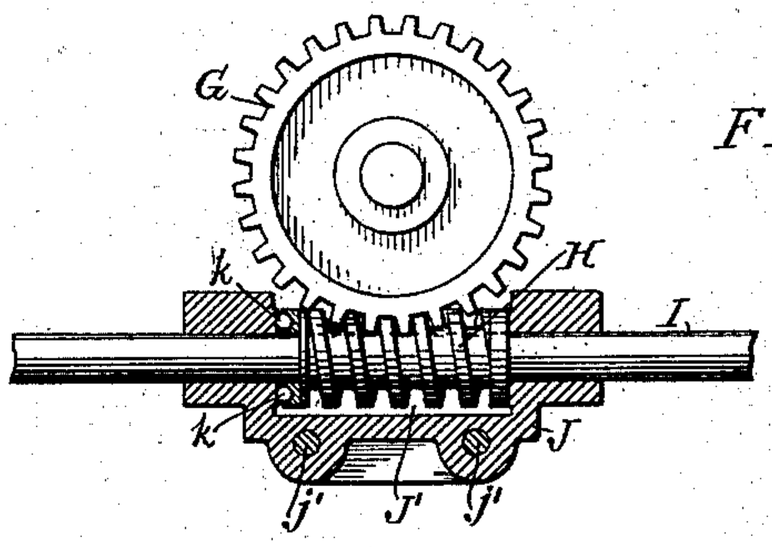


FIG. 5.

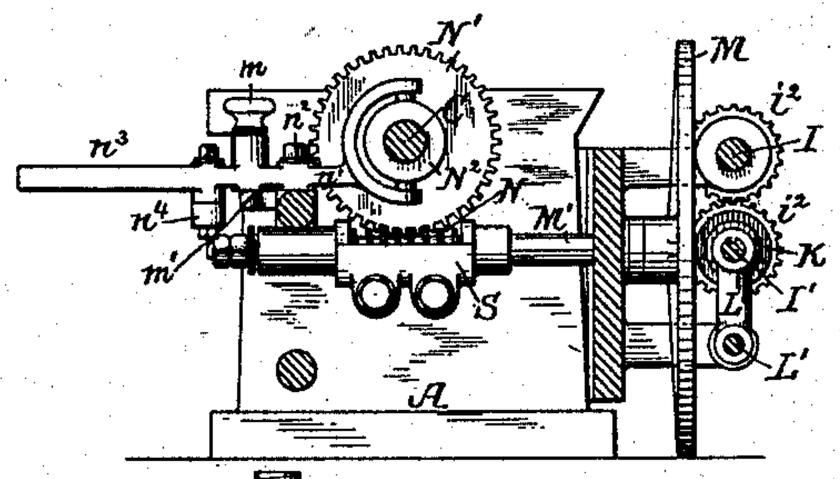


FIG. 4.

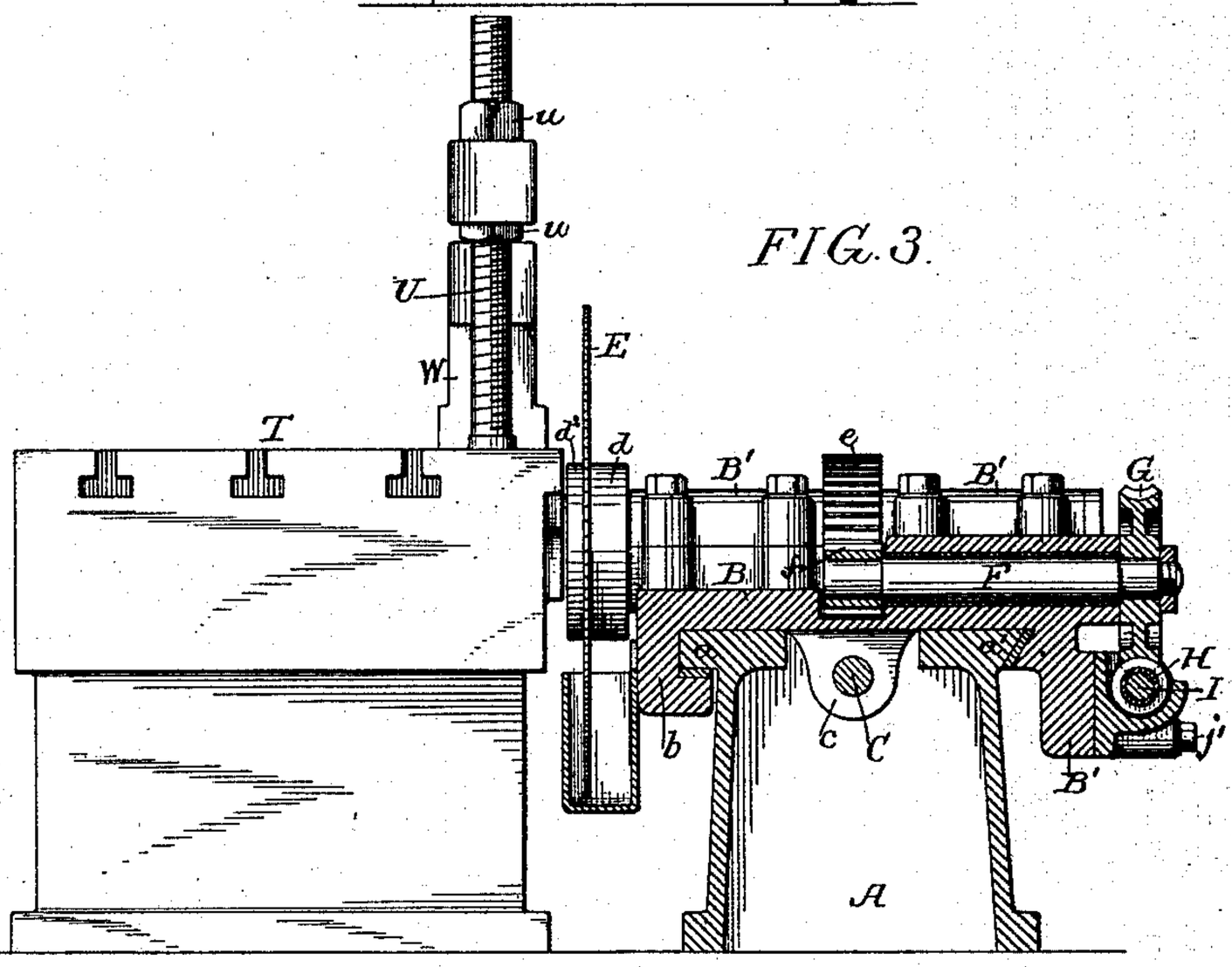


FIG. 3.

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# UNITED STATES PATENT OFFICE.

CHARLES C. NEWTON, OF PHILADELPHIA, PENNSYLVANIA.

## MACHINE FOR SAWING METAL.

SPECIFICATION forming part of Letters Patent No. 410,009, dated August 27, 1889.

Application filed June 4, 1889. Serial No. 313,057. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES C. NEWTON, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in Machines for Sawing Metal, of which the following is a specification.

The object of my invention is to construct a machine for severing metal bars and plates by sawing while the metal is cold, as fully described hereinafter, reference being had to the accompanying drawings, in which—

Figure 1 is a side view of my improved metal-sawing machine. Fig. 2 is a plan view. Fig. 3 is a transverse section on the line 1 2, Fig. 2. Fig. 4 is a section on the line 3 4, Fig. 2; and Fig. 5 is a section on the line 5 6, Fig. 2.

A is the base of the machine, on which slides a carriage B, one side *b* of which overlaps a rib *a* on the bed-plate A and bears upon its under side, so as to prevent the carriage from lifting, and the opposite side of the carriage is undercut to correspond with the V-shaped edge *a'* of the bed-plate A, this being the usual construction in machines of this class.

Passing through a nut *c*, Fig. 3, on the under side of the carriage B is a screw-threaded shaft C, Fig. 2, which is the feed-shaft of the machine, and is driven through the medium of mechanism described hereinafter, and is mounted in suitable bearings C' C' at each end of the bed-plate.

On the carriage B is mounted the shaft D of the saw. The shaft is adapted to suitable bearings B' on the carriage, and is threaded at its outer end for the reception of the saw or other suitable tool when the device is used for purposes other than sawing. The saw E, having teeth, as shown in Fig. 1, is secured to a nut *d*, adapted to the threaded portion of the shaft D. The saw is secured to the nut by bolts *d'*, passing through a sleeve or collar $d^2$ on the opposite side of the saw, as shown in Fig. 6, so that the saw can be readily removed from the shaft without removing other parts of the machine. The shaft D is driven in the present instance from a shaft F through the medium of a pinion *f* and a gear-wheel *e*, secured to the shaft D. The shaft F has at one end a worm-wheel G, which meshes with a worm H, splined to the driving-shaft I, so that it will be turned by the shaft but slide thereon, the shaft being provided with fast and loose pulleys *i i'*. The shaft I is mounted in suitable bearings *j* on the frame of the machine.

Depending from the carriage B is a bracket B', to which is secured the bearing J for the shaft I. This bearing is not fixed to the shaft, but travels upon the same, as shown in Figs. 1 and 2, the bearing being secured to the bracket by bolts *j'*.

Between the worm H and its bearing J are a series of anti-friction balls *k k*, as shown in Fig. 5, adapted to V-shaped grooves in either a collar on the worm or in the bearing itself, so as to reduce the friction caused by the thrust of the worm-wheel on the worm. The bearing is so made that it forms a cup J', in which is placed the lubricating material for lubricating the worm and worm-wheel, so that the parts are at all times thoroughly lubricated.

The shaft I is geared to a shaft I', Fig. 1, through gear-wheels $i^2$, and splined to the shaft I' is a roller K, adapted to turn with the shaft but free to slide thereon. This roller K is confined between two sleeves *l l* of a yoke L, which is adapted to a screw-threaded rod or shaft L', mounted in suitable bearings in the frame of the machine, the shaft being provided at one end with a hand-wheel $L^2$, for a purpose described hereinafter.

The friction-wheel K bears upon the face of a disk M, as shown in Figs. 1, 2, 3, and 4, and this disk is mounted on a transverse shaft M', turning in suitable bearings in the frame of the machine, and on the shaft is a worm N, which meshes with a worm-wheel N' on the feed-shaft C, Fig. 4. The worm-wheel N' is loose on the feed-shaft C, and a tubular extension of the hub of the worm-wheel has a clutch-face *n*, Fig. 2, which engages with the teeth of a clutch $N^2$, free to slide on but turning with the feed-shaft C. This clutch is thrown into and out of gear with the worm-wheel by a clutch-lever *n'*, pivoted at $n^2$ to the frame of the machine, and has a handle $n^3$ at one end of the machine, by which the operator can throw the feed in or out, and also has a rod $n^4$ pivoted to the handle, which extends to the opposite end of the machine, so that the attendant at that point can stop the feed, if necessary.

A pin *m* on the lever *n'* is adapted to an

orifice in a bracket $m'$, Fig. 4, so that when the clutch is thrown out of gear with the worm-wheel N′ the pin $m$ holds it in this position, and the clutch cannot be thrown in gear without first lifting the pin clear of the orifice in the bracket $m'$.

By having the friction-wheel K under the control of the screw-shaft L′, Fig. 1, the speed of the carriage can be regulated to a nicety by simply moving the wheel toward or from the center of the disk. If the wheel is moved toward the center, the speed of the disk will be increased, and by moving it toward the periphery of the disk the speed will be decreased, as will be readily understood.

To return the carriage to its normal position the clutch $N^2$ is thrown into gear with the clutch-face on the hub of a gear-wheel $p$, which meshes with a gear-wheel on the shaft I. The shaft C is also provided with a hand-wheel $p^2$, by which the table can be fed by hand when circumstances require.

It will be noticed that the bearing S for the worm N is of the same general construction as the bearing J for the worm H, and between the worm N and the bearing are anti-friction balls. When the clutch $N^2$ is thrown out of gear with the worm-wheel N′, the pressure of the disk M against its roller K will be decreased. Owing to the fact that the wheel is released from the strain caused by the pressure of the saw against the metal being cut, the pressure of the disk M will be barely enough to enable the disk to turn the shaft M′; but as soon as the clutch is thrown into gear the worm-wheel forces the shaft and its disk against the roller K, thereby creating sufficient friction for the roller to turn the disk, thereby turning the feed-shaft of the machine.

At one side of the machine is a table T, grooved, as shown, for the reception of suitable clamps for the metal to be cut, and at the upper end of the table are two vertical screw-posts U U, carrying a cross-beam V, the cross-beam being mounted between two nuts $u$ $u$, one above and one below the beam, one end of the beam being open, as shown in Fig. 1, to allow the beam to be thrown to one side, one of the posts acting as a pivot, so that the table will be clear for the insertion of a bar or rod to be severed, after which the beam is returned to its normal position and the screws $v$ $v$ are passed through the clamp.

At one side of the bed T is a V-groove T′ for the reception of rods, as shown in Fig. 1. The clamp W for the rod is V-shaped on its under side, so that the rod is grasped at four points in the V-shaped groove, and the post U′, having nuts $u'$, supports this clamp W, together with one of the vertical posts U. By turning the upper nuts the required holding pressure is obtained. The clamp W also has one side open for the purpose of allowing it to be swung around out of the way of the groove when a rod is required to be inserted, although in some cases this clamp need not be turned to one side, but raised sufficiently to allow the insertion of the rod to be severed.

The operation of the machine is as follows: The metal to be severed is clamped to the table T by the mechanism described, and the carriage so adjusted that the saw will be in position to sever the metal when the saw is set in motion. The driving-belt is then shifted to the fast pulley on the driving-shaft I, which sets the machine in motion. As the saw revolves it is fed to the metal by the carriage-feeding mechanism. The movement of the carriage can be stopped at any point by simply throwing the clutch $N^2$ out of engagement with the teeth on the hub of the worm-wheel N′. After the saw has passed through the metal and severed it the carriage can be returned to position and the metal removed from the table.

I claim as my invention—

1. The combination of the bed-plate of a metal-sawing machine, the carriage mounted thereon, the saw spindle or shaft mounted on said carriage and carrying at one end a saw, a worm-wheel adapted to drive the shaft, with a driving-shaft, a worm meshing with said wheel and adapted to travel with the carriage, but free to be revolved by the driving-shaft, said worm having its bearings in a lubricating-box in which the worm travels and is lubricated, substantially as described.

2. The combination, in a metal-sawing machine, of the carriage, saw-shaft mounted thereon, a worm-wheel, a driving-shaft carrying a worm free to slide thereon, a bearing for the worm-shaft on the carriage, with a series of balls between the end of the worm and the bearing.

3. The combination of the carriage, nut thereon, feed-screw, feed-shaft, a worm-wheel thereon, a worm carried by a transverse shaft mounted in the lubricating-box, and a bearing on the frame, substantially as and for the purpose set forth.

4. The combination of the screw-threaded saw-spindle, a saw with two sleeves, a bolt securing the saw and sleeves together, one of said sleeves being threaded and adapted to the thread on the screw-spindle, substantially as set forth.

5. The combination of the saw-spindle carrying the saw with a shaft parallel with the spindle, a pinion on the shaft gearing with a wheel on the spindle, a worm-wheel mounted on the shaft and meshing with a worm carried by the driving-shaft, substantially as specified.

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

CHARLES C. NEWTON.

Witnesses:

WILLIAM D. CONNER,

HENRY HOWSON.