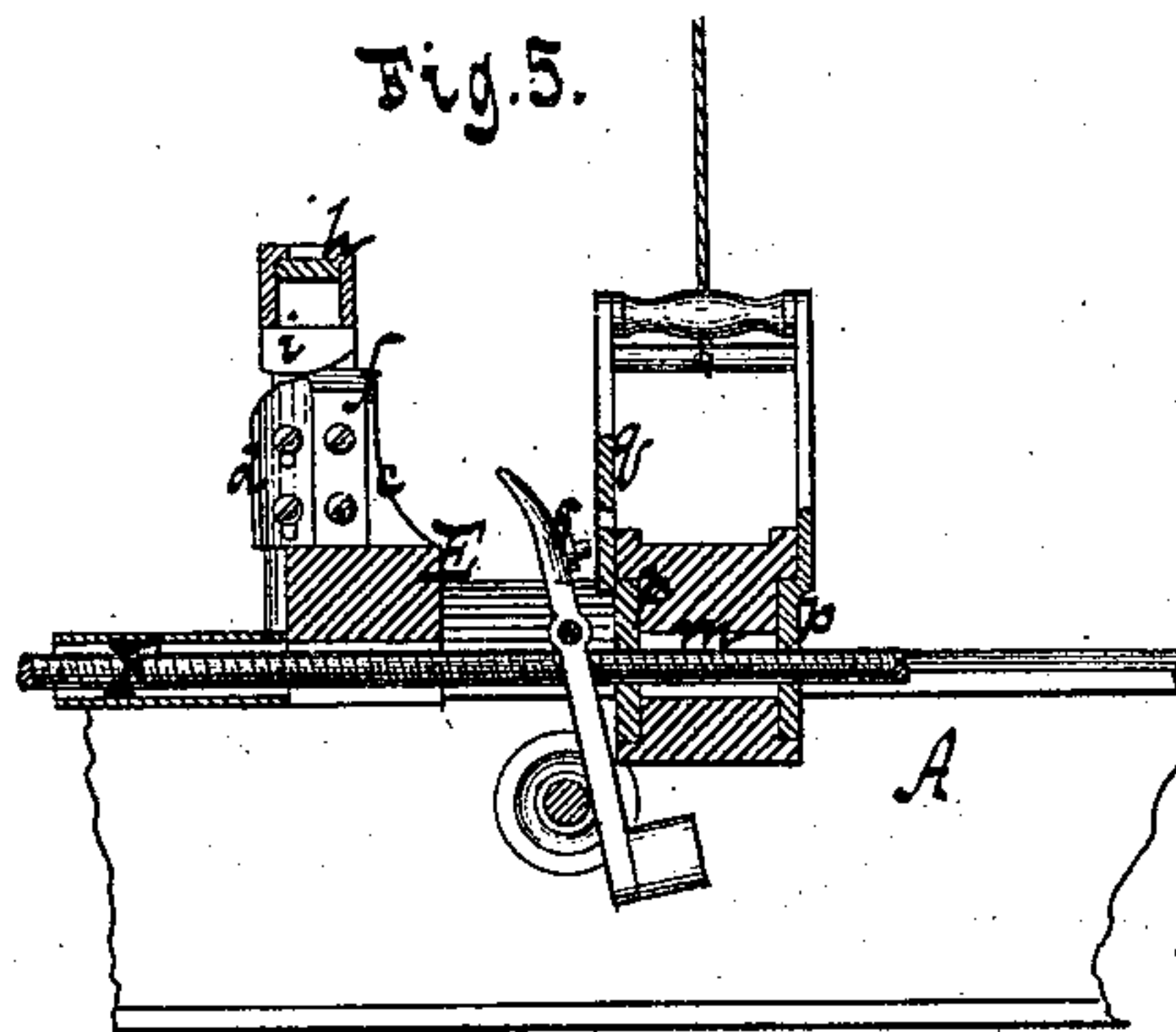
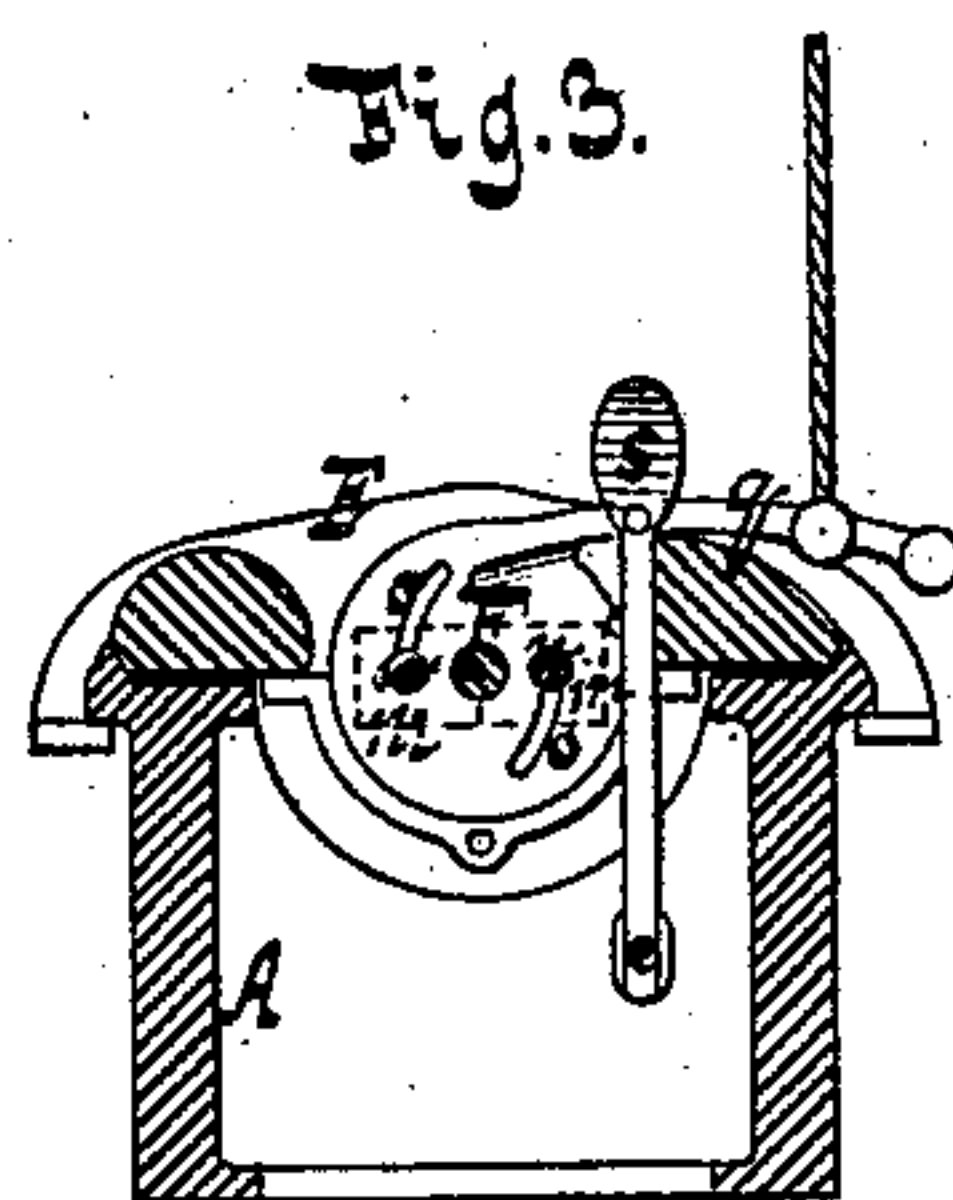
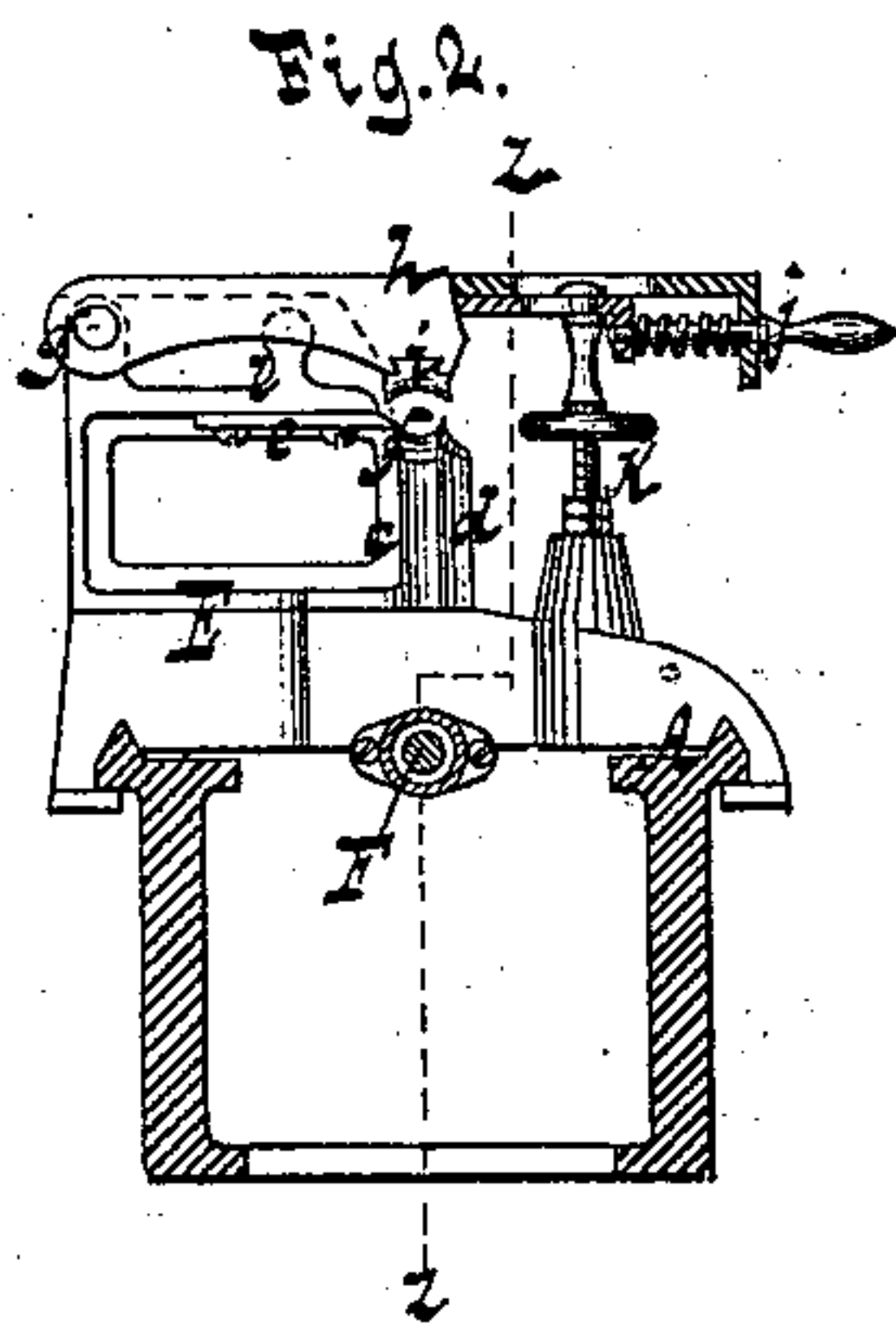
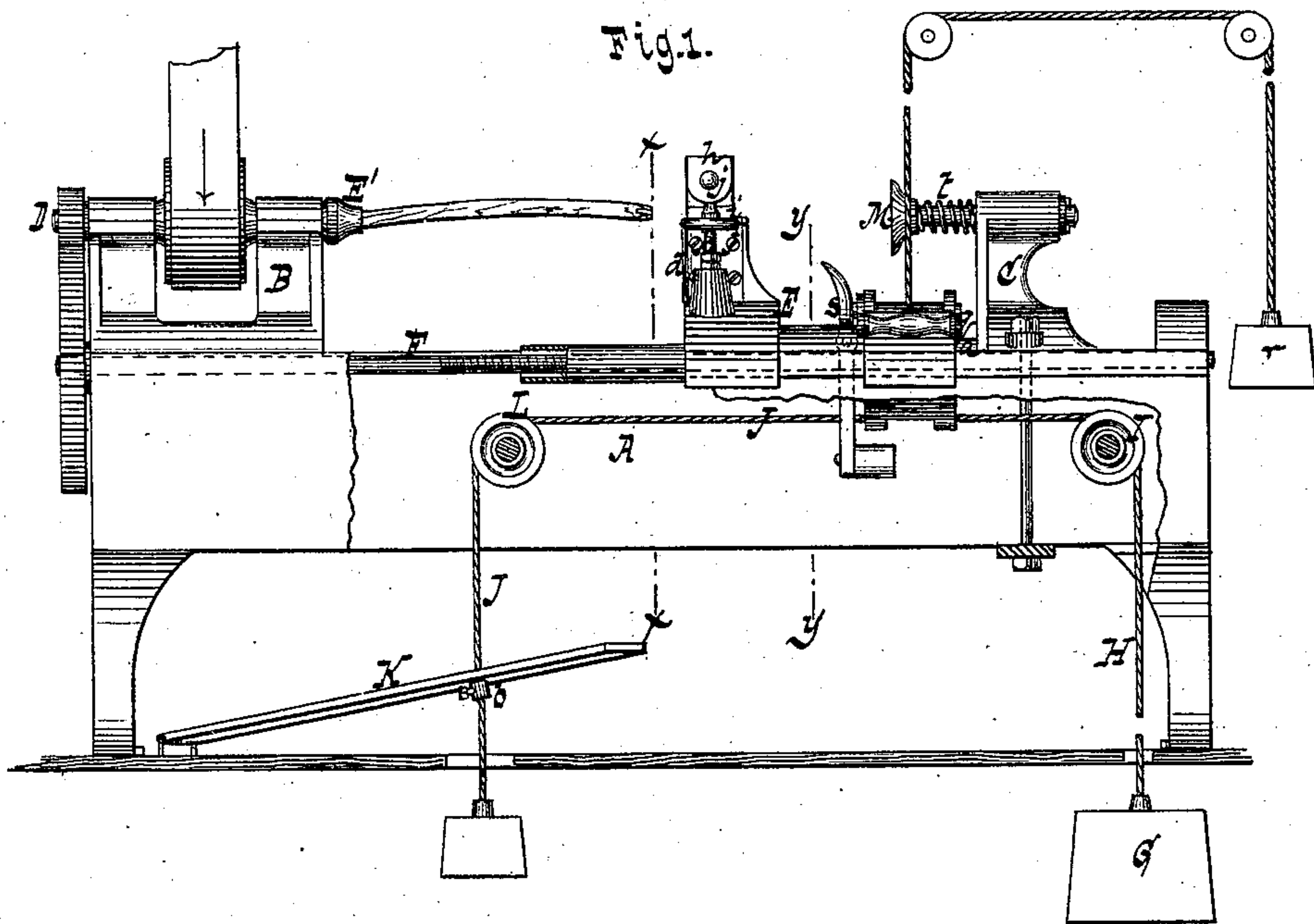


W. S. AUCHINCLOSS.
Machine for Turning Treenails.

No. 205,604.

Patented July 2, 1878.



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UNITED STATES PATENT OFFICE.

WILLIAM S. AUCHINCLOSS, OF WILMINGTON, DELAWARE.

IMPROVEMENT IN MACHINES FOR TURNING TREENAILS.

Specification forming part of Letters Patent No. **205,604**, dated July 2, 1878; application filed March 20, 1878.

To all whom it may concern:

Be it known that I, WILLIAM S. AUCHINCLOSS, of Wilmington, in the county of New Castle and State of Delaware, have invented a new and useful Improvement in Machines for Turning Treenails and other similar articles, which improvement is fully set forth in the following specification, reference being had to the accompanying drawing, in which—

Figure 1 represents a side elevation, partly in section. Fig. 2 is a transverse section in the plane $x x$, Fig. 1. Fig. 3 is a similar section in the plane $y y$, Fig. 1. Fig. 4 is a detached elevation of the divided nut and the mechanism for operating the same. Fig. 5 is a longitudinal vertical section in the plane $z z$, Fig. 2.

Similar letters indicate corresponding parts.

This invention consists in the combination, in a machine for turning treenails or other similar articles, of a chuck mounted on the end of a lathe-spindle, and adapted to engage with the end of the blank or stick to be turned, two die-blocks secured in a slide-rest, and adapted to be set to the size of the article to be turned, and suitable cutters, which are also secured to the slide-rest, so that during the operation of turning the cutters are enabled to follow the direction of the grain in the stick, and the full strength of the treenails or other articles, when the same are finished, is preserved.

With the slide-rest and the standard which supports the cutters and the lower die-block is combined a hinged lever, which carries the upper die-block, and which, when turned down, is locked by a spring-catch, so that it can be opened at any moment for the purpose of releasing or removing the treenail or other article. The spring-catch of this hinged lever engages with the head of an adjusting-screw, for the purpose of setting the die-blocks to correspond to the desired diameter of the article to be turned, said adjusting-screw being adapted to be operated at any moment before beginning the operation of turning, or while said operation progresses.

The divided nuts are operated by cam-slots formed in disks, which are connected to a lever-frame that is subjected to the action of a weight or spring, and adapted to engage with

a catch, which is automatically released when the treenail or other article to be turned is finished, and thereby the forward motion of the slide-rest is stopped automatically at the proper moment. When the slide-rest is disengaged from its feed-screw, it is drawn back by a weight attached to it, and the treenail or other article which is retained between the die-blocks is thrown out by the action of a spring-cup secured in the tail-stock of the lathe. With the slide-rest is combined a foot-lever, for the purpose of moving the die-blocks and cutters contained in the same up against the end of the stick or blank after the end of the same has been inserted into the chuck secured to the lathe-spindle.

In the drawing, the letter A designates the frame or shears of a turning-lathe, on one end of which is secured the head-stock B, while its opposite end supports the tail-stock C.

The head-stock forms the bearing for the spindle D, to which a revolving motion is imparted by a belt or other suitable means. On the inner end of this spindle is secured a chuck, E', which is provided with a socket of a square or other suitable cross-section, adapted to receive the ends of the sticks or blanks to be turned, and to transmit to said sticks the revolving motion of the spindle without, however, confining them strictly in line with said spindle. This results from the socket in the chuck being so shallow as to admit of the stick being deflected in any direction, but still being deep enough to retain the end of the said stick in proper position while it is rotating between the die-blocks and under the action of the knives.

The chuck might be attached to its spindle by a universal joint, and then the socket might be so deep and of such other dimensions as to prevent the deflection of the stick within it, as a necessary deflection would be permitted by the universal joint.

As the construction of this modification is so simple and obvious, I have not thought it necessary to illustrate it in the drawing.

Between the head-stock B and the tail-stock C is situated the slide-rest E, which receives a forward motion by a feed-screw, F, and which, when released from said feed-screw, is drawn back against the tail-stock by means of a weight,

G, suspended from a rope or chain, H, which is secured to the slide-rest and extends over a pulley, I, as shown in Fig. 1.

On the inner end of the tail-stock are secured elastic cushions *a*, which receive the slide-rest when the same is moved back by the action of the weight G.

The slide-rest connects, by a second rope or chain, J, with a treadle or foot-lever, K, said chain being made to extend over a pulley, L, and provided with an adjustable stop, *b*, to regulate the position of the foot-lever to the length of the stick or blank to be turned. By stepping on this foot-lever the slide-rest is caused to move toward the head-stock.

From the slide-rest E rises a standard, *c*, which supports the roughing-cutter *d*, the finishing-cutter *e*, and the lower die-block *f*. Said standard forms the bearing for a pivot, *g*, which forms the fulcrum of a lever, *h*, to which is secured the upper die-block *i*. In the outer end of this lever is secured a spring-catch, *j*, which, when the lever is depressed, engages with the head of a screw, *k*, that is tapped into the body of the slide-rest, so as to lock the handle and to bring the die-blocks *f i* in the proper relation to each other.

The power to open the combination at will is of the utmost importance in securing rapidity of action.

By turning the screw *k* in or out, the distance between the die-blocks can be readily adjusted to the diameter of the article to be turned; and in order to manipulate said adjusting-screw conveniently, it is provided with a hand-wheel.

If desired, the distance between the die-blocks can be changed as the operation of turning progresses.

From the standard *c* rises a guide, *l*, which fits between downwardly-projecting flanges of the lever *h*, (see Fig. 2,) so as to secure said lever against lateral movement.

The die-blocks *f i* are slightly tapering or bell-mouthed, so that they admit the end of the stick to be turned a sufficient distance to expose the same to the action of the roughing-cutter *d*.

As the slide-rest is moved forward by its feed-screw the stick is turned off to the required size, its surface being smoothed off by the finishing-cutter *e*, and finally polished as it is forced through between the high portions of the die-blocks. During this operation the cutters and the die-blocks follow the grain of the stick, so that the treenail or other article, when finished, preserves its full strength.

This feature of my invention is of particular value in turning treenails, since a treenail, even if the same deviates from a straight line, will adapt itself to the hole into which it is driven, while the same is useless if it is turned out across the grain at any point.

The slide-rest is moved forward by the feed-screw F, which can be made to engage with two half-nuts, *m m*, which are fitted into the body of the slide-rest, and made to close up

against the feed-screw from opposite sides. From the sides of the half-nuts project pins *n n*, which catch in cam-slots *o o* in disks *p p*, which are fitted into circular cavities formed for their reception in the body of the slide-rest, and which are connected to a lever-frame, *q*, so that by raising said frame the half-nuts are opened and by depressing the lever-frame the half-nuts are closed up. The lever-frame is exposed to the action of a weight, *r*; or a spring may be used for this purpose, which has a tendency to throw the same and to move the half-nuts out of gear with the feed-screw.

When the lever-frame is depressed it can be locked down by a catch, *s*, which extends down between the shears A, and which, when the slide-rest has reached the forward end of its movement, strikes the shaft of the pulley L, or any other fixed portion of the shears A, so that it releases the lever-frame *q* and permits the slide-rest to follow the action of the weight G. At the same time the slide-rest comes in contact with the belt-shifter, and the revolving motion of the spindle D is stopped. Any suitable belt-shifter may be used for this purpose—such, for instance, as those commonly used in metal-planers; and I have not represented such mechanism in the drawing. As the slide-rest is moved backward by the action of the weight G it withdraws the finished treenail or other article from the chuck E', and the front end of said treenail strikes a cup, M, which flares outward from the inner end of a shank, which is fitted to slide in a sleeve or socket on the tail-stock C, and subjected to the action of a spring, *t*, which has a tendency to retain said cup in the position shown in Fig. 1. When the slide-rest is drawn back by the action of the weight G, the outer end of the treenail strikes the cup M, and as the die-blocks are drawn along over the entire length of the treenail the spring *t* is compressed. When the slide-rest strikes the cushions *a*, the cup M, in recovering its original position by the action of the spring *t*, ejects the treenail or other article from between the die-blocks, so that it drops upon a suitable chute (not shown) and is carried into a suitable receptacle, leaving the slide-rest free for the reception of another blank or stick.

By this machine treenails or other similar articles can be turned with great rapidity and precision, the diameter of said articles can be varied at any moment without difficulty, and the articles, when finished, preserve their full strength, the cutters being adapted to follow the grain of the blanks. It is also impossible for the articles to remain caught among the cutters and dies, for they can instantly be released by opening the spring-catch and raising the lever.

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

1. The combination, in a machine for turning treenails or other similar articles, of a chuck, mounted on the end of a lathe-spindle, and adapted to engage with the end of the

crank or stick to be turned, two or more die-blocks secured in a slide-rest, and adapted to be set to the size of the article to be turned, and suitable cutters, constructed and adapted for cutting wood, which are also secured to the slide-rest, the parts being so constructed that they allow the cutters to follow the direction of the grain in the stick, substantially as and for the purpose set forth.

2. The combination of die-blocks and cutters, constructed to cut wood, and arranged on separate frames upon the slide-rest, so as to form a clasp around the treenail or other similar article turned, which frame can be adjusted at will and unclamped at any moment, so as to release the treenail, or aid in the adjustment of the dies or the sharpening of the cutters, all substantially as shown, and for the purpose set forth.

3. The combination, with the slide-rest which supports the cutters and the lower die-block, the hinged lever which carries the upper die-block, and with the spring-catch for locking and releasing said hinged lever, of an adjusting-screw for setting the die-blocks to correspond to the desired diameter of the article to be turned, substantially as set forth.

4. The combination, with a slide-rest, with its feed-screw, and with two half-nuts adapted to be moved to or from said feed-screw, of a lever-frame which serves to move the half-nuts, a catch for locking said lever-frame, a stop for releasing said catch, and a weight or spring for moving the lever-frame automatically, substantially as shown and described.

5. The combination, with a slide-rest, its feed-screw, two half-nuts operated by a lever-frame, a catch for locking the lever-frame, a stop for releasing said catch, and a weight or spring for operating the lever-frame, of a weight adapted to draw back the slide-rest automatically as soon as the lever-frame is moved, substantially as set forth.

6. The combination, in a machine for turning treenails or other articles, of a chuck mounted on the spindle of the turning-machine, and adapted to engage with the end of the blank, a slide-rest carrying two die-blocks and two cutters, a feed-screw for moving the slide-rest forward, mechanism for releasing the feed-screw and for drawing back the slide-rest, and a spring-supported cup mounted in the tail-stock of the turning-machine, all constructed and adapted to operate substantially as shown and described.

7. The combination, in a machine for turning treenails or other articles, of a chuck mounted on the spindle of the turning-machine, and adapted to engage with the end of the blank, a slide-rest which carries two die-stocks and two cutters, and a foot-lever which connects with the slide-rest, substantially as and for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 15th day of March, 1878.

WM. S. AUCHINCLOSS.

Witnesses:

JNO. HENRY PUHL,
WM. W. PRITCHETT.