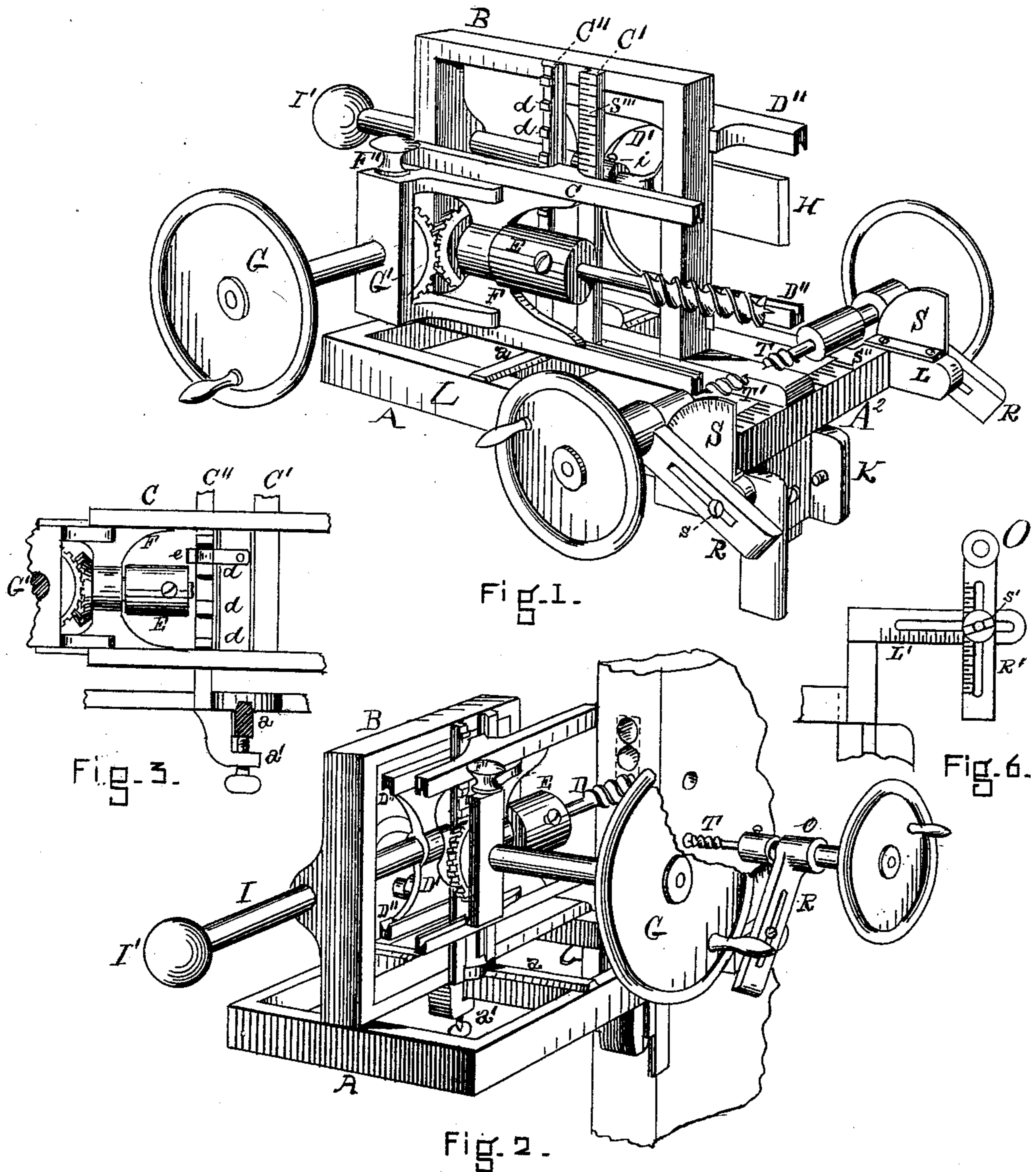


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No. 218,028. Patented July 29, 1879.



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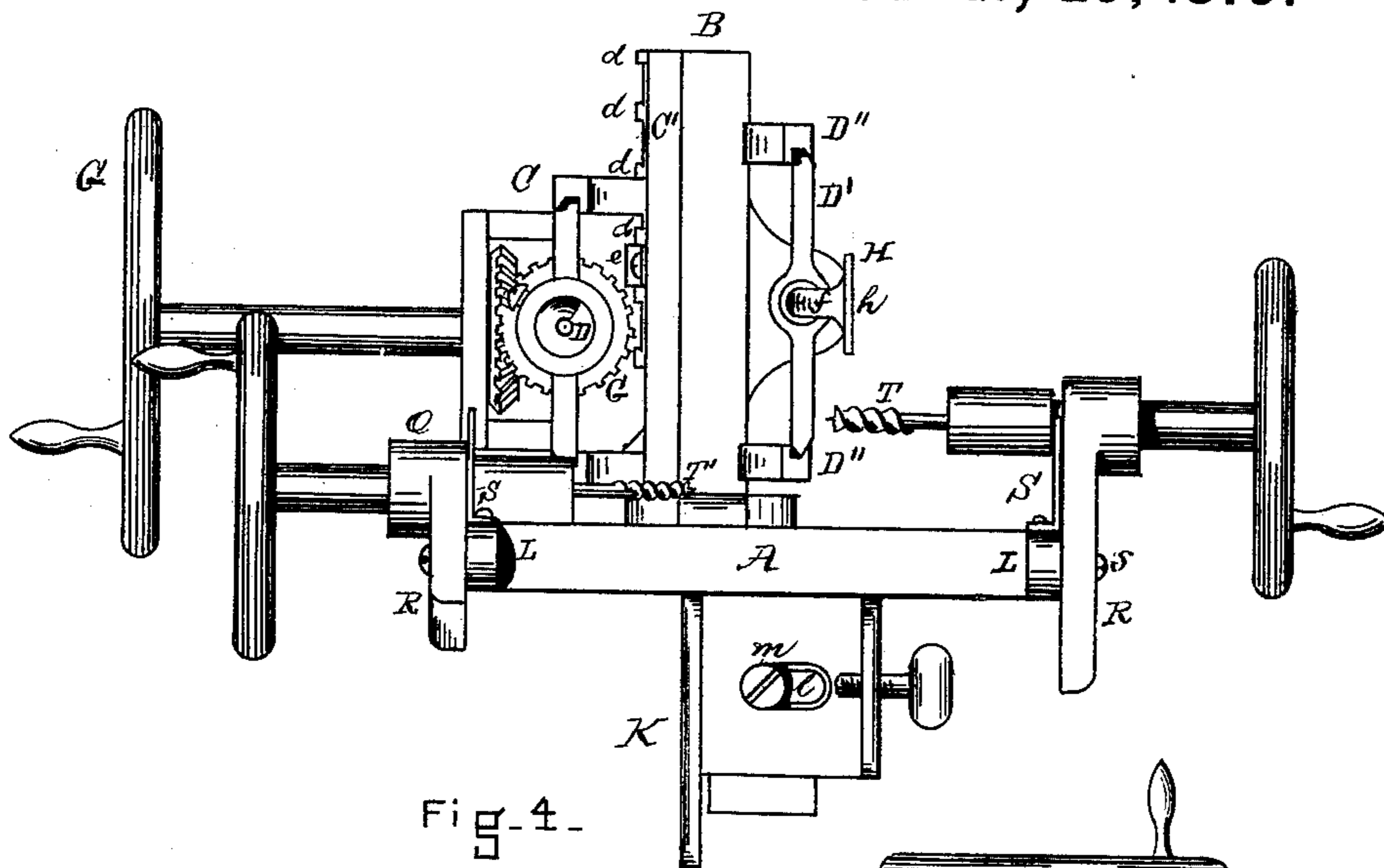


Fig. 4.

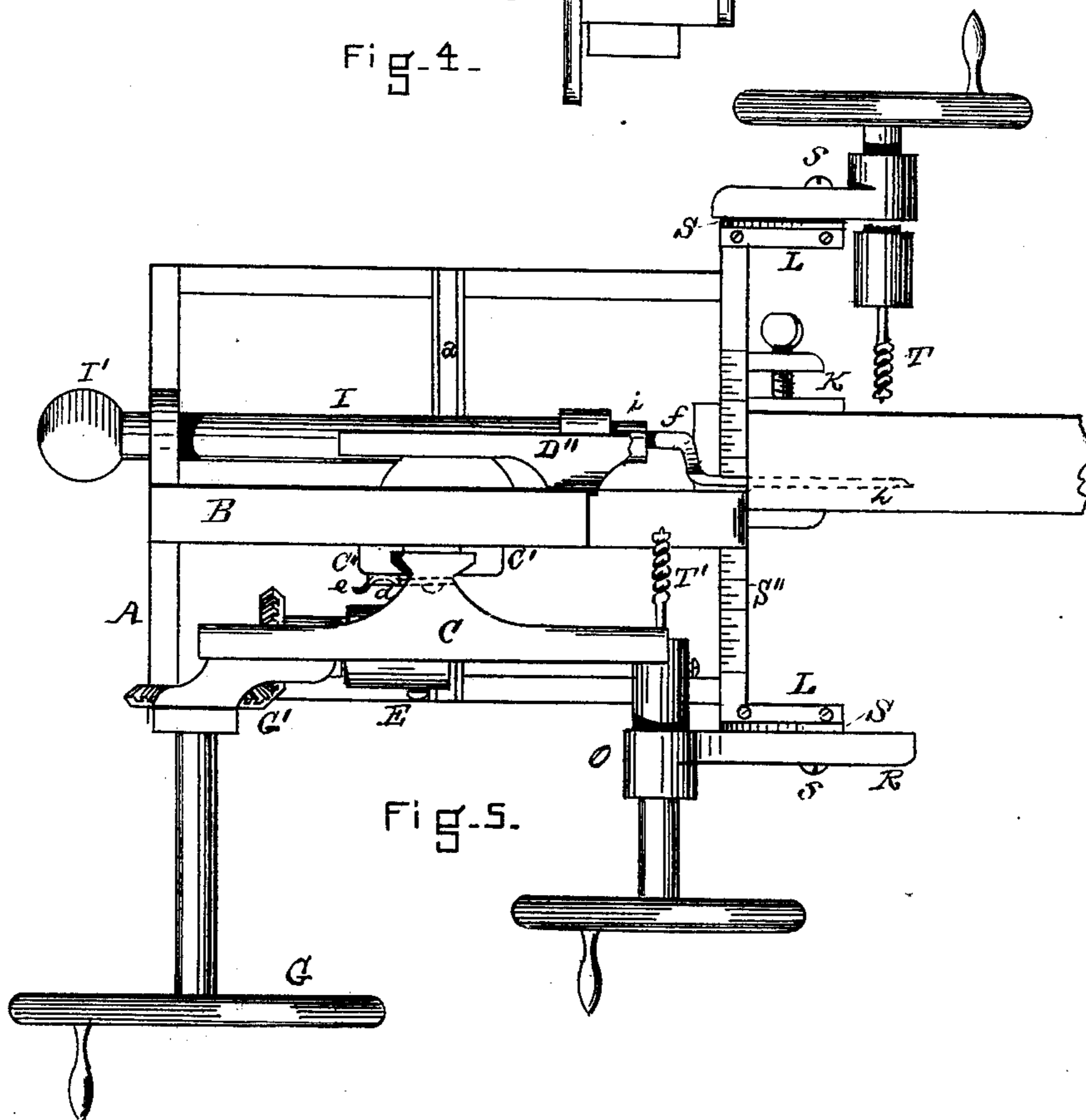


Fig. 5.

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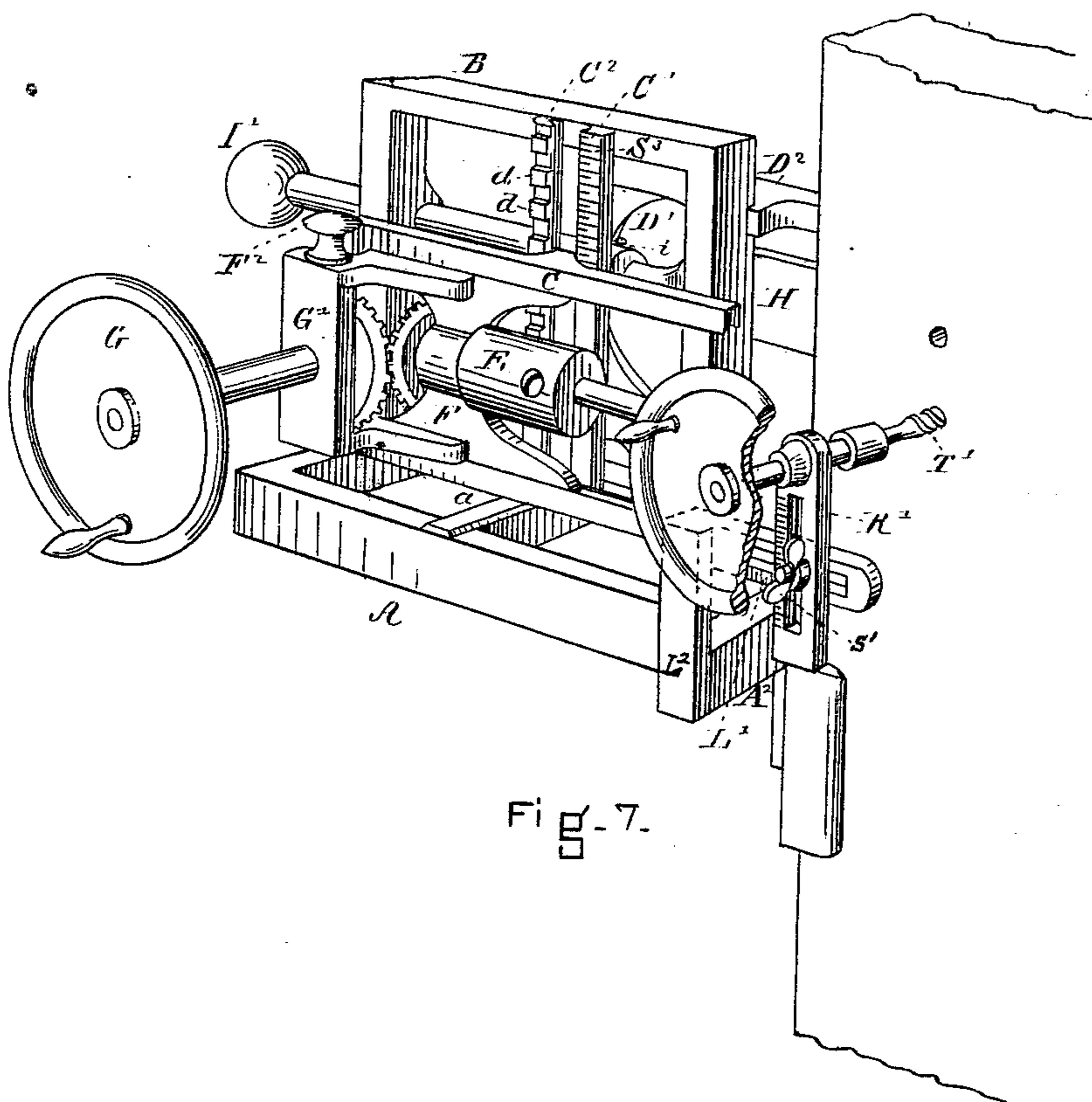


Fig. 7.

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UNITED STATES PATENT OFFICE.

HILAND A. HOLT, OF NASHUA, NEW HAMPSHIRE, ASSIGNOR TO JENNIE M. HOLT, OF SAME PLACE.

IMPROVEMENT IN MACHINES FOR MORTISING DOORS FOR LOCKS.

Specification forming part of Letters Patent No. **218,028**, dated July 29, 1879; application filed March 21, 1879.

To all whom it may concern:

Be it known that I, HILAND A. HOLT, of Nashua, Hillsborough county, New Hampshire, have invented an Improvement in Machines for Mortising Doors for Locks, of which the following is a specification.

My invention relates to machines for gaging and cutting mortises in doors to receive the locks.

It is well known by builders that in forming these mortises a considerable degree of skill is required in order to make the mortise of such size that the lock will fit it accurately, and, more especially, to determine the point upon the face of the door where the key-hole shall be cut and the opening bored for the knob. This work, when done by hand, requires much time and painstaking, and it happens frequently that it is done in such a way as to deface the door, since many builders cannot afford to employ first-class labor upon this class of work.

It is the object of my invention, therefore, to provide a machine which shall enable this work to be performed by persons of a low degree of skill, and at the same time perform the task in a manner equal, if not superior, to the hand labor of the highly-skilled artisan, and in about one-sixth part of the time.

To this end my invention consists in a machine adapted to be clamped to the door, and so organized that it may be set to the size of the lock by means of a simple gage upon the machine. By the same means, also, the devices for cutting the knob and key holes are brought into the required position, when, by operating the mechanism, these openings, as well as the lock-mortise, are accurately formed in a very short time.

I will now proceed to describe my machine more specifically, reference being made to the drawings forming part of this specification, in which—

Figure 1 is a perspective view of my invention. Fig. 2 is a perspective view, showing the apparatus clamped to a door and in position for operation. Fig. 3 is a detached part, showing the devices by which the mortise-bit is operated. Fig. 4 is a front elevation of the machine, and Fig. 5 is a plan view of the same.

Fig. 6 is a detail view, showing, in a modified form, part of the devices employed to determine the position of and to cut the key-hole or the opening for the knob. Fig. 7 is a perspective view of the machine clamped to a door, showing a modified form of the parts which carry the tools for cutting the key and knob holes, said parts being shown detached in Fig. 6.

A indicates the frame upon which the operative parts are mounted. This is made of wood or metal, the latter being much preferable. About the center of this platform I place a vertical skeleton-frame, B, upon which I mount the bit for boring the mortise, and the chisel for cutting or clearing the sides thereof.

The vertical frame B has lateral adjustment upon the platform-frame A, it being guided by a spline, *a*, and held at any given point by a clamp, *a'*, beneath the frame A. (See Fig. 3.)

Upon one side of the vertical frame B is mounted a carrier, C, having a vertical adjustment in grooved ways *C' C''*, the latter having upon its outer edge a coarse rack, of which the teeth *d d d* are placed at intervals of five-eighths ($\frac{5}{8}$) of an inch, which is the exact diameter of the mortise-bit D. A plate-spring, *e*, upon the carrier C engages with the teeth *d d* of said rack, (see Fig. 3,) and by this means the bit D may be successively dropped or lowered the required distance after each cut. This bit D is revolved by gearing in a sliding block, F, moving in grooves in the carrier C, whereby the bit may be driven forward, the operator grasping with one hand the knob F'; and with the other turning the crank-wheel G, by which motion is communicated to the bit through the bevel-gears G'.

Upon the opposite side of the vertical frame B is placed the chisel H, mounted in a stock or handle, I, which moves freely in a horizontal direction, it being guided by a sliding block, D', moving in grooved ways *D'' D'''*. This chisel, of which I use two different sizes, is of a width exactly equal to the length of the mortise to be cut, in order that the entire side of the mortise shall be cut at a single stroke of the chisel. The shank of the latter is bent into the form shown in Fig. 5 at *f*, and

the straight prolongation of said shank is set in the stock I, and held by a clamp-screw, *i*. The distance from the axial line of this stock I to the plane of the outer surface, *h*, of the chisel H is exactly equal to one-half the width of the mortise, in order that the chisel may, after clearing one side of the mortise, be withdrawn and revolved, together with the stock I, one-half a revolution, or through an arc of one hundred and eighty degrees, bringing it exactly opposite the other side of the mortise, in position to make the second cut and complete said mortise.

Upon the forward end of the platform A is attached a clamp, K, with lateral adjustment by means of a slot and set-screw, *m*, and by this clamp the machine is fastened to a door, as shown in Fig. 5.

These parts, the operation of which will be hereinafter described, comprise the devices for cutting the mortise for receiving the lock.

In order to form the key and knob holes, it is necessary to employ a cutting tool or tools having a considerable range of adjustment, corresponding with the different location of the key and knob holes in locks of different sizes and styles. For this purpose I have devised two separate arrangements of parts, (one being a modification of the other,) either of which may be used. One method of arranging and combining these devices is shown in Fig. 1, while the modified (and in some respects preferable) form is illustrated in Fig. 7, and is also shown detached in Fig. 6.

In the first arrangement I prolong the side bars of the platform A, and mount upon their extremities the slotted bars R, which carry the cutting-tools T and T'. A set-screw, *s*, passes through the slot in the bar, upon which said bar turns freely, and by which it may be clamped and held at any point. A longitudinal adjustment is also obtained by means of the slot through which the set-screw passes. Between the bar and the platform may be placed a segment-plate, S, having its arc graduated, as shown. This graduation is in this particular arrangement intended to guide the eye of the workman, and aid in detecting any accidental movement of the bar after it is once clamped in place. This form of construction is, moreover, intended for use when the position of the key-hole and knob-hole is determined by actual measurement by means distinct from the machine. When this is done and the bar R brought into proper position, it may be firmly clamped in place, and the machine may then be used to operate upon any number of doors in which the same size and style of lock is to be used, since the openings for the knob and key are, in locks of the same size, in the same position.

The modified arrangement shown in Figs. 6 and 7 consists of an upright supporting-bar, L², which rises from the angle of the platform A, or from the prolonged extremity of the front transverse piece, A². This upright carries a horizontal slotted arm, L¹, upon which

is placed a similarly-slotted arm, R'. A set-screw, S', passes through the slots in these arms, allowing the upright arm R' to move either horizontally upon the arm L¹, or to be adjusted perpendicularly, the set-screw S' clamping it securely in any given position. The proportions of these parts are such that the upper edge of the horizontal arm is in the same plane with the bottom of the mortise, or, in other words, with the lowest adjustment or cut of the mortising-bit D. Moreover, the edge of the upright bar L² is exactly in line with the edge of the door when the machine is clamped thereto. It is evident, therefore, as both bars are graduated upon one edge in inches and fractions thereof, that measurements upon the scale marked on the horizontal arm will be from the edge of the door toward the rear of the mortise, while measurements upon the scale of the vertical arm will be from the bottom or lower side of the mortise toward the top. Now, it is a general rule that in locks of the same size or number the key-hole is placed at the same distance behind the face-plate and above the lower edge of the lock, so that a practical builder generally knows, from looking at the number of the lock, how many inches must be measured in each direction. It is only necessary, therefore, for him to slide the vertical arm R' along the scale marked on the bar L¹ until its edge shall correspond with the graduation indicating the number of inches to be laid off from the front. Then, holding the set-screw S' against lateral motion, the vertical arm R' is raised or slid upward until the scale thereon indicates that the proper point has been reached, when the bar is clamped in that position by means of the set-screw S'. Upon the end of the arm is mounted the cutting-bit, and by operating this the aperture is formed. It should be noted that the graduation on both arms is laid off from a line passing through the axis of the bit T', so that all distances measured on the scales marked on the arms L¹ and R' will be accurately marked by the point of the bit itself.

I will now describe the functions of the remaining parts of the apparatus.

The operation of my machine is as follows: Being clamped to the door, as shown in Figs. 2 and 5, the vertical frame B is adjusted upon the platform-frame A by means of the graduated index-scale S'' until the bit D is exactly opposite the point where the mortise is to be formed. The bit is then raised to the top of the mortise by simply lifting the carrier C, the spring *e* slipping over the inclined lower faces of the teeth *d d*. When the desired point is reached, which may also be indicated by an index-scale, S''', the operator seizes the knob F' and drives the sliding block F forward, at the same time revolving the bit by the crank-wheel G. The first cut being made and the bit withdrawn, the finger of the operator is pressed upon the spring *e*, allowing the frame C to drop until the spring engages with the

next tooth *d*, when the operation is repeated until the bottom of the mortise is reached.

The next step is to clear the side walls of the mortise by cutting away the wood not removed by the bit. In order to do this the operator first loosens the clamp-screw *a'*, and moves the vertical frame B laterally until the chisel H is brought into position. This adjustment may also be indicated with great accuracy by the index-scale *S''*. Then, with the hand, or by a blow with a mallet upon the end *I'* of the stock I, the chisel is driven into the mortise, clearing one side thereof at a single stroke. It is then withdrawn, revolved one-half a revolution, and again driven forward, cutting the other wall of the mortise and finishing it.

I have already described the peculiar form of this chisel by which I am able to clear both sides of the mortise without moving the vertical frame B. A simple half-revolution of the chisel is all that is necessary to bring it into position to clear both sides of the mortise. It is not necessary to add that in different sizes of locks it will be necessary to use different sizes of chisels; but this is also necessary in cutting the mortises by hand labor, and as there are seldom more than two sizes of locks used in any one house, two chisels of different sizes will be enough.

I am aware of the Patents No. 10,603, March 7, 1854; No. 68,791, September 10, 1867; No. 151,268, May 26, 1874, and No. 168,656, October 11, 1875, and claim nothing shown or described in any of them.

My machine is light, strong, and so simple in its organization that it cannot easily get out of order.

It is evident that it will not only execute the work for which it is adapted with such perfect accuracy as to make a much more elegant appearance than hand-work, but that it will also do it in less than one-sixth the time necessary to perform it in the old way by hand-work.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. A lock-mortising machine consisting of a rigid supporting-frame, adapted to be clamped rigidly upon the edge of the door, a laterally-

adjustable support carrying a bit upon one side and a chisel having a bayonet-shaped shank upon the other, and a key-hole-cutting mechanism consisting of a bit mounted upon two slotted graduated arms, *L*¹ and *R'*, arranged with reference to the other parts substantially in the manner and for the purpose set forth.

2. The combination, in a lock-mortising machine, of a rigid supporting-frame adapted to be clamped to the edge of the door, a laterally-adjustable vertical frame, a bit having vertical adjustment thereon, and a revolving chisel having a bent or bayonet-shaped shank, the length of the bend being equal to half the width of the mortise, in order that the chisel may, by being revolved, clear both sides without moving the frame which carries said chisel, as set forth.

3. The combination, in a lock-mortiser, of a rigid frame adapted to be clamped to the door, a vertical supporting-frame having lateral adjustment, a mortising bit and chisel carried by said frame, a vertical bar, *L*², and two slotted arms, *L*¹ *R'*, the upper edge of the former being in the plane of the lowest adjustment of the bit, forming, together with the vertical bar *L*², two fixed points, from which the position of the key-hole can be measured and determined, in the manner set forth.

4. The combination, with the frame A, of the vertical adjustable frame B, carrier C, sliding block F, revolving stock E, and gear *G'*, as set forth.

5. The combination, with the laterally-adjustable frame B, of the carrier *D'*, ways *D''*, chisel H, having bent shank *f*, and revolving stock I, as set forth.

6. The combination, in a door-mortising machine, of the slotted graduated arm *L*¹, the slotted graduated bar *R'*, the pivot set-screw *S'*, and the bit for boring the key-hole, all substantially as set forth.

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

HILAND A. HOLT.

Witnesses:

CHAS. E. HIBBARD,
L. L. TILDEN.