

J. Humphrey.

Mortising Mach.

N^o 98,265.

Patented Dec. 28, 1869.

Fig. 1.

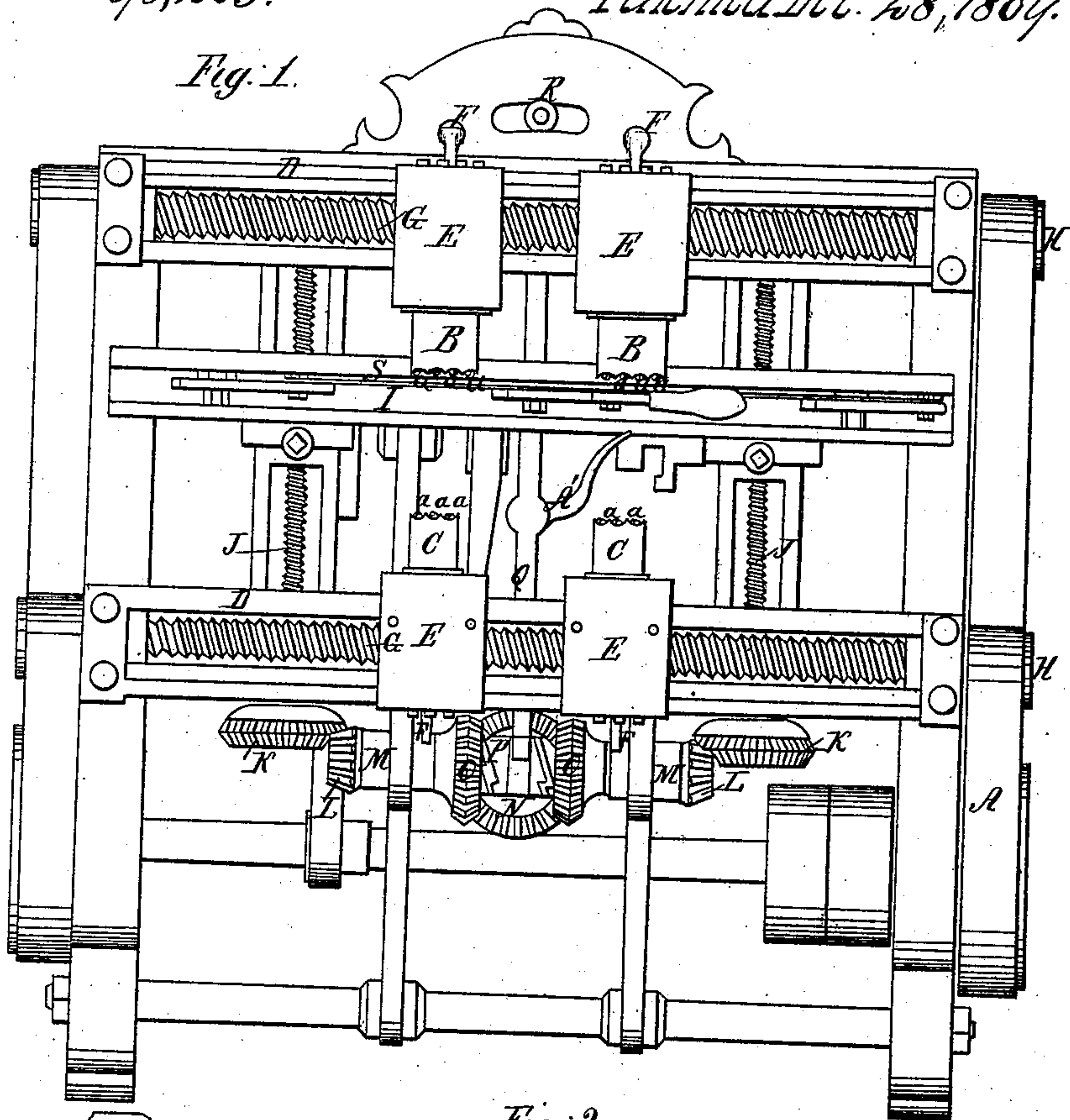
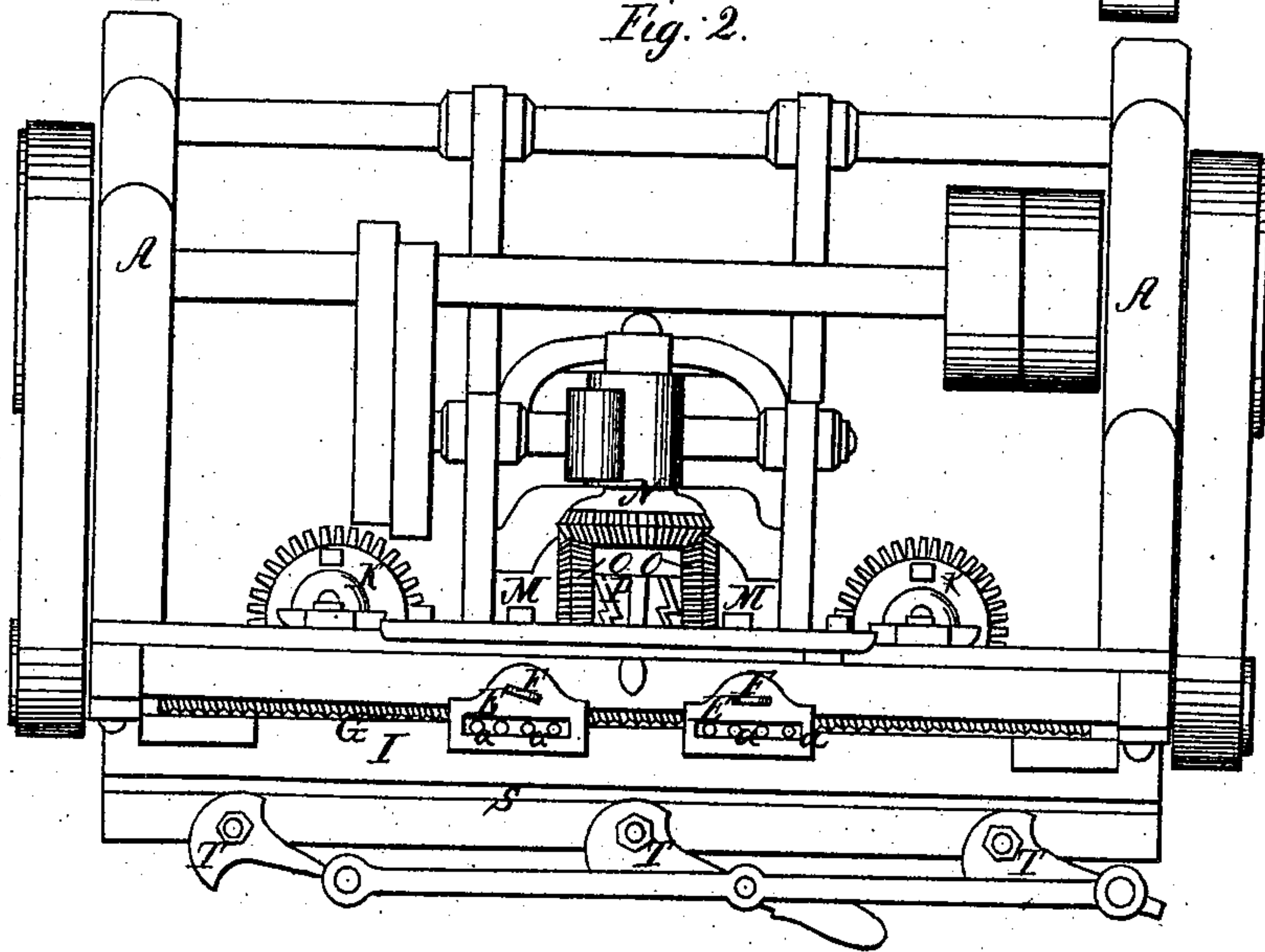


Fig. 2.



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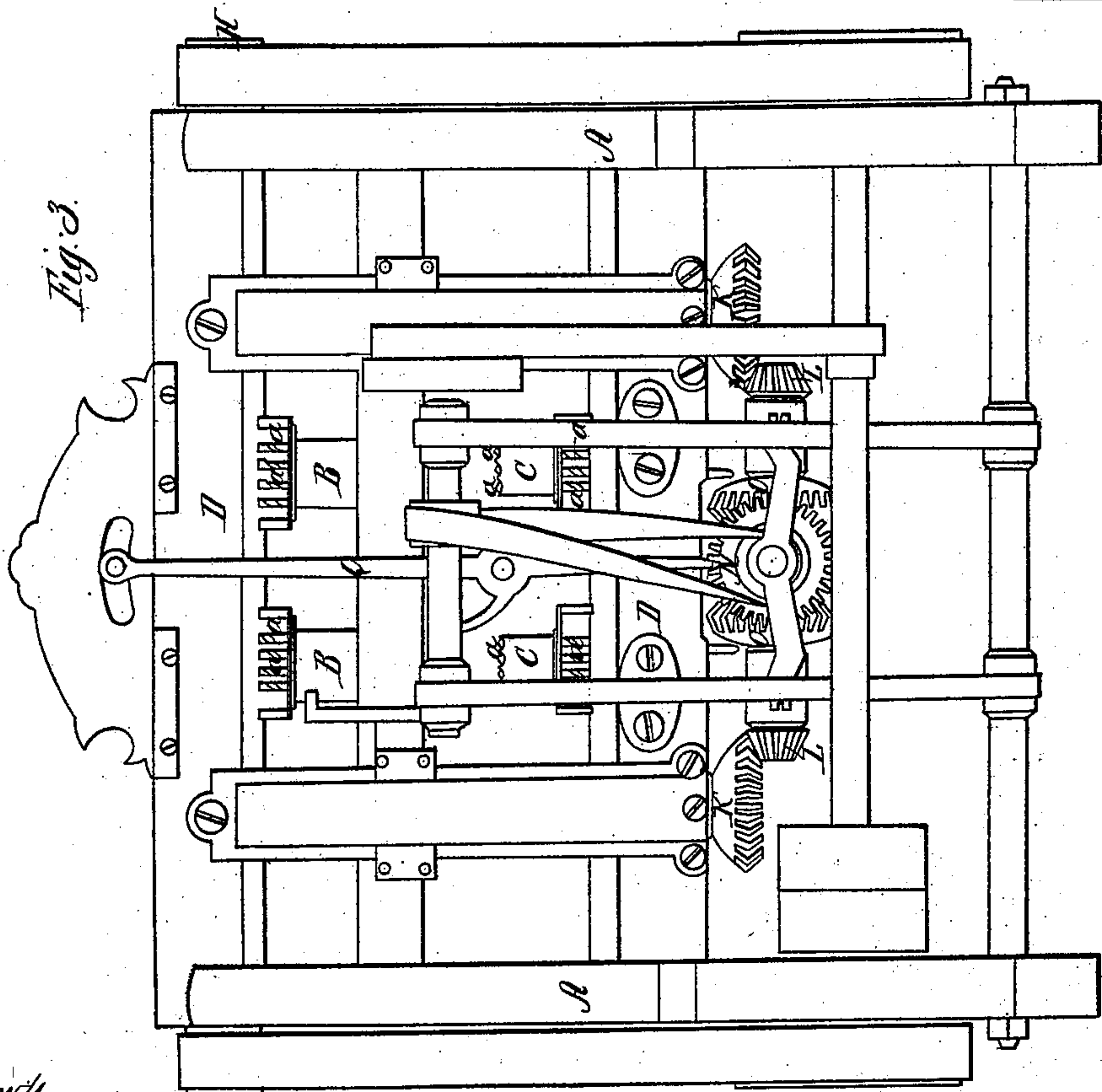
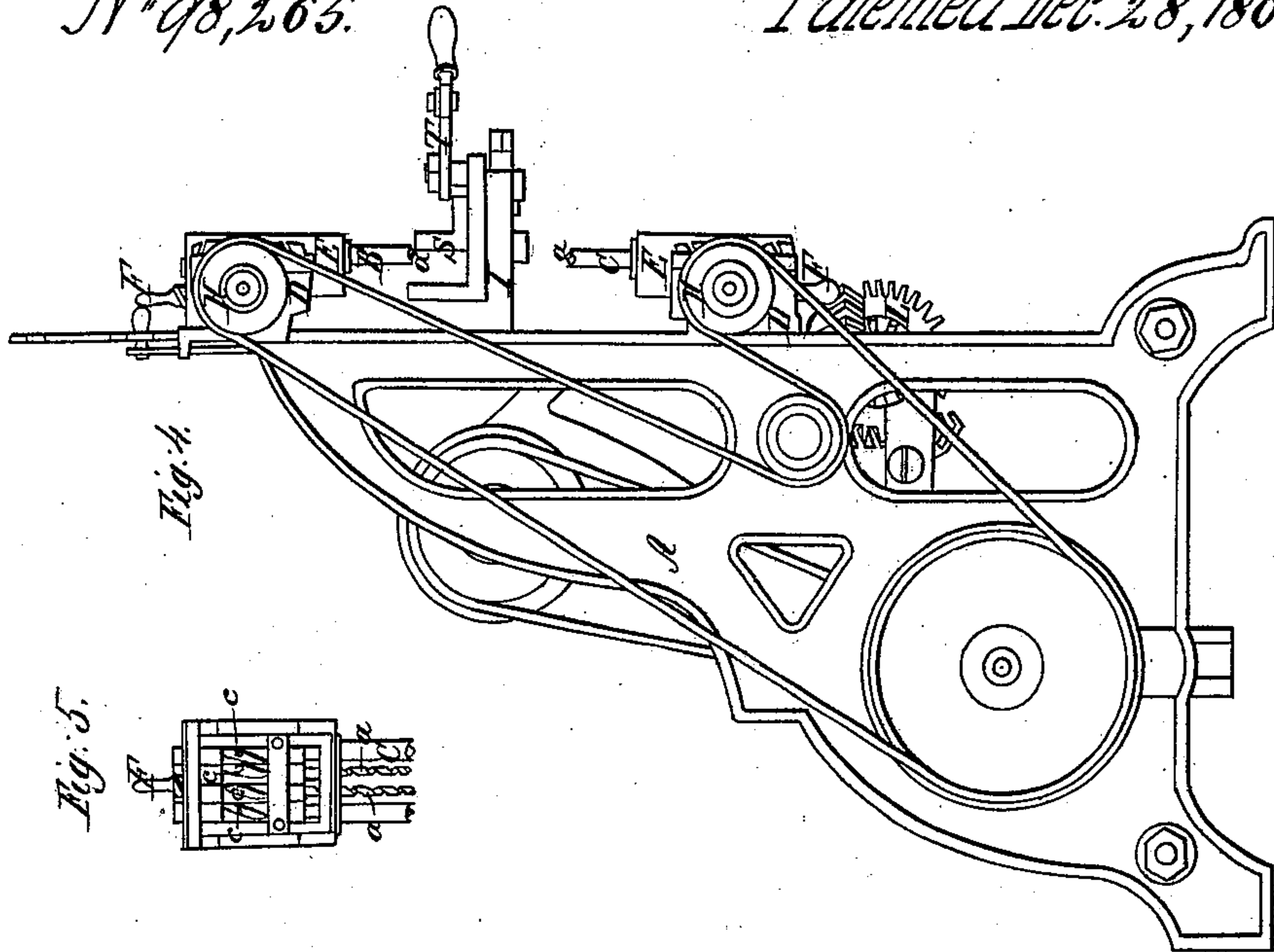
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JOHN HUMPHREY, OF RAVENNA, OHIO.

Letters Patent No. 98,265, dated December 28, 1869.

IMPROVEMENT IN BORING AND MORTISING-MACHINE.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, JOHN HUMPHREY, of Ravenna, in the county of Portage, State of Ohio, have invented certain new and useful Improvements in Boring and Mortising-Machines; and I do hereby declare that the following is a full and complete description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a side view of the machine.

Figure 2, a view of the top.

Figure 3, a view of the rear side.

Figure 4, a side view.

Figure 5, a detached section.

Like letters of reference refer to like parts in the several views presented.

This invention relates to a boring and mortising-machine, the augers or bits of which, whereby the boring is done, being driven by a screw operating directly upon the shanks of the augers, said augers being arranged within the chisels, whereby the mortising is done, as hereinafter more fully described.

It further relates to the construction of the boring-tools, and the arrangement of the devices whereby the boring and mortising-tools are adjusted and held, and in the arrangement of the devices for adjusting the table which sustains the piece that is to be bored and mortised.

Augers or boring-instruments have been revolved by means of a revolving screw, working in a pinion upon the shaft or shank of the boring-tool, but where very small boring-bits or augers are used, it is necessary to have the shank of the same, in order to secure the proper strength, of nearly the same size in diameter as the hole that the bit or auger may bore. Consequently a pinion having inclined teeth, and of greater diameter than the shank of the auger, could not be placed around the shank of the boring-tool, for it is intended that the boring-tool will bore away all, or nearly all the wood within the length of the mortise, and they must run close together, and there will be no room for the insertion of a pinion on the shank by which to revolve the tool, while in this invention the augers are driven by the revolving screw when the shanks of the boring-tools occupy all, or nearly all the space in the length of the mortise, and no pinions are or can be used upon the shanks of such bits or augers, by which construction very much smaller boring-tools can be used than by any other known construction or arrangement of devices, and at the same time the boring-tool has a higher velocity than can be given to it by means of a pinion, which adds much to its perfection in the operation of boring.

In fig. 4, A represents one end or side of a frame, in which the devices for boring and mortising are arranged.

E is the case or frame which contains the augers, in which the augers revolve, and to which the hollow chisels B C are attached, and are secured to the transverse guides or slides D by means of the set-screws F, whereby said clamps and chisels may be adjusted upon the slides, as the nature of the work may require.

Within said chisels are arranged the augers or bits *a*, fig. 5, a section of the chisel being broken away in order that they may be seen. Said augers may be more or less in number, according to the length of the mortise to be cut, and which, as will be observed, are placed close to each other, so that the holes thereby made will have but little wood left between them to be cut out or away by the chisels.

Within and between the transverse slides D is a screw, G, which is so arranged, in relation to the bits contained within the chisels, that the threads thereof fit and run in corresponding grooves *c*, fig. 5, cut in the stem or shaft of the augers, and whereby said augers are made to revolve, as motion is given to the screw by the pulley H, belted to and operated by an appropriate arrangement of mechanism.

I, figs. 1 and 4, is an adjustable table situate between the chisels, and whereon is laid the work for boring and mortising.

Said table is moved upward and downward by means of the screws J, actuated by the bevel-wheels K, which are made to engage in the pinions L, secured to the shaft M, and which is thrown into and out of gear with the driving-wheel N by means of the pinions O, loosely fitted to the shaft, and made to engage with the clutch P, said clutch being loosely fitted and feathered to the shaft, and moved into and out of engagement with the side-wheels O, for operating the same, by the lever Q, extending upward from the clutch to the top of the machine, where it may be operated by the hand, a handle, R, being provided for that purpose.

Having thus described the construction and arrangement of the machine, the practical operation of the same is as follows, viz:

This machine is designed more especially for mortising door and window-sash stuff, which, when used for doors, two sets of augers and chisels B C are used conjointly.

It will be observed that said chisels are of different width, the upper set B being wider than the lower set C, the purpose of which is that the mortises beaten in the door-stuff require to be wider or longer on one side than on the other, to allow of the tenon being keyed in the mortise.

The timber or stuff to be operated on is laid upon the table, immediately under the chisels, and thereon firmly secured by the jam S, which is forced against the stuff by means of the cams T, fig. 2.

Motion is now given to the augers by means of the

screw above described, actuated by an arrangement of pulleys provided for that purpose. The table is now moved upward by the screws J, actuated by the gearing K, L, and N, by throwing them into gear by the clutch P.

The timber, as it is being bored, is also cut into a mortise by the chisels co-operating therewith. The required depth having been obtained, the direction of the table is reversed by the clutch being switched from one gear to the other, thereby reversing the action of the screws, which will run down the table to the lower set of augers and chisels, the relation of which to the upper set is such as to bore and cut the mortise at the under side of the stuff, in exact corresponding relation to that cut by those above, thereby completing the mortise, which will be longer on the upper side than on the lower one, in consequence of the difference in the width of the chisels.

The reverse movement of the table may be effected by the operator, by means of the lever Q, or it may be operated by the table, independently of the person using the machine, by allowing the arm U to come in contact with the arm A' of the lever Q, at the required time for shifting the clutch.

By the use of a screw for operating the augers, said augers can be arranged close to each other, thereby boring away most of the wood for the mortise, so that the chisels will have much less to cut in forming the mortise than if the holes were bored distant from each other, which they must be when driven by means of a belt and pulley in the ordinary way.

Augers thus operated by a screw can be used in cutting very small mortises; but asordinarily cut in

a machine, without boring a series of holes, the timber immediately in and about the mortise is often fractured and split by the chisels, thereby either spoiling the work or injuring it more or less in strength and value.

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

1. The combination of the endless screw G with a series of two or more augers, *a a*, having inclined grooves *c* in the shanks thereof, and arranged in the manner and for the purpose described.

2. The automatic reciprocating table I, in combination with the upper and lower series of boring-augers *a a* and chisels B C, when all the parts are constructed and arranged to operate in the manner and for the purpose described.

3. The combination of the screw G, auger or series of augers *a*, with the chisels B C, when constructed and arranged with relation to each other, and operating in the manner and for the purpose substantially as described.

4. The combination of the chisels B C, having boring-augers *a*, clamps E, transverse slides D, with the table I, jam S, and cam T, all constructed and arranged to operate substantially as described.

5. The combination of the lever Q, clutch P, and table I, when arranged to operate substantially in the manner and for the purpose described.

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Witnesses:

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