

T. S. GREENMAN.
Paper Cutting-Machines.

No. 156,217.

Patented Oct. 27, 1874.

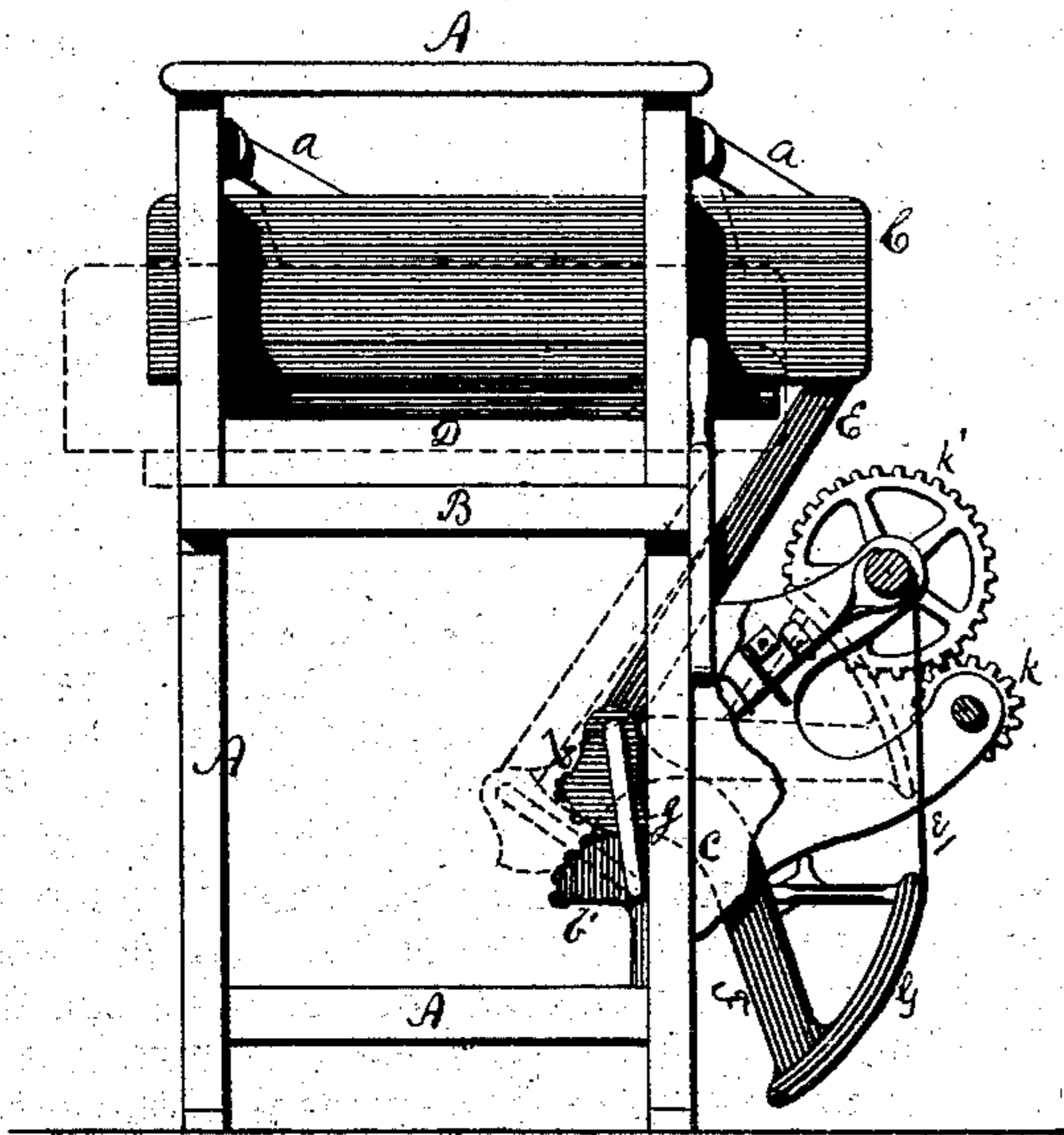


FIG. 1.

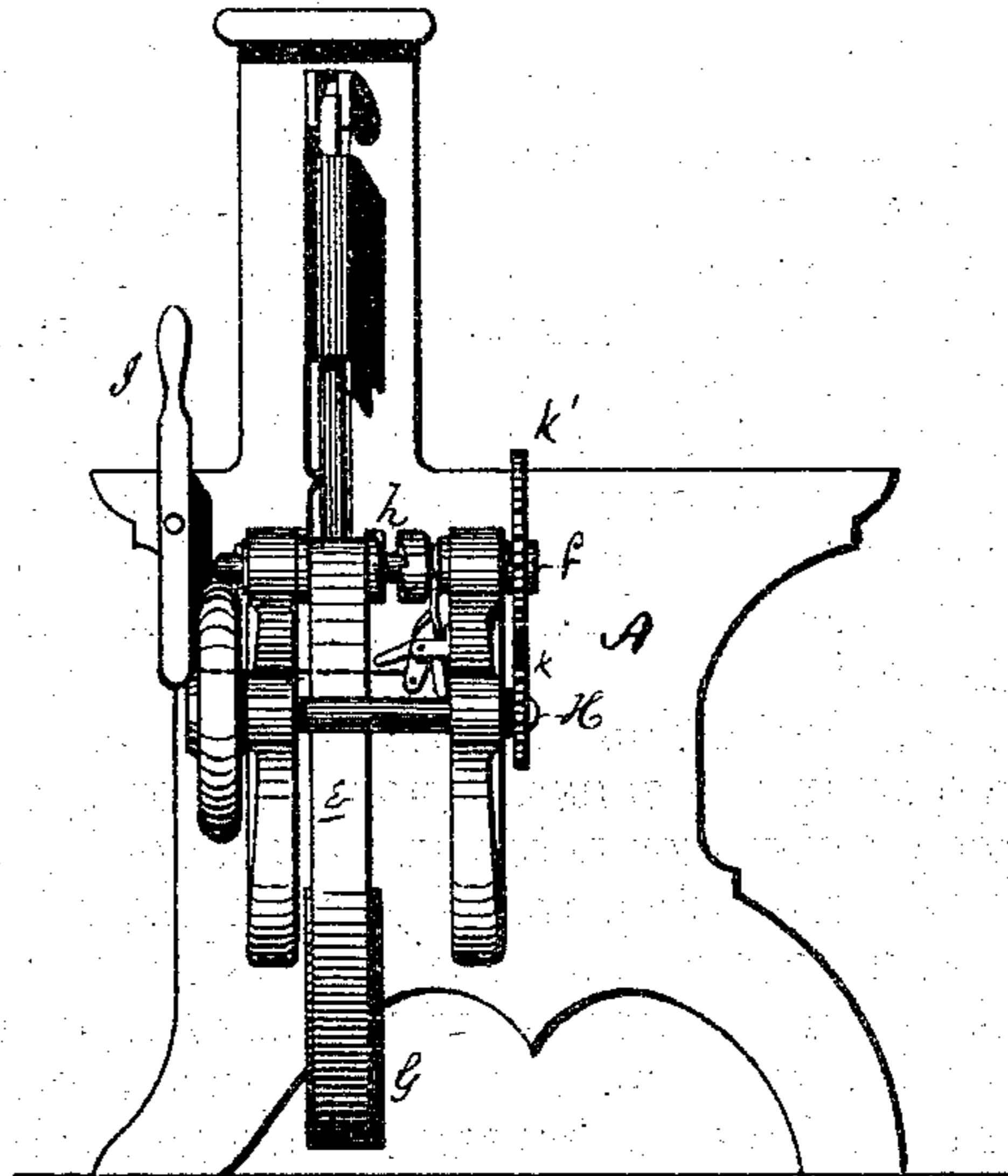


FIG. 2.

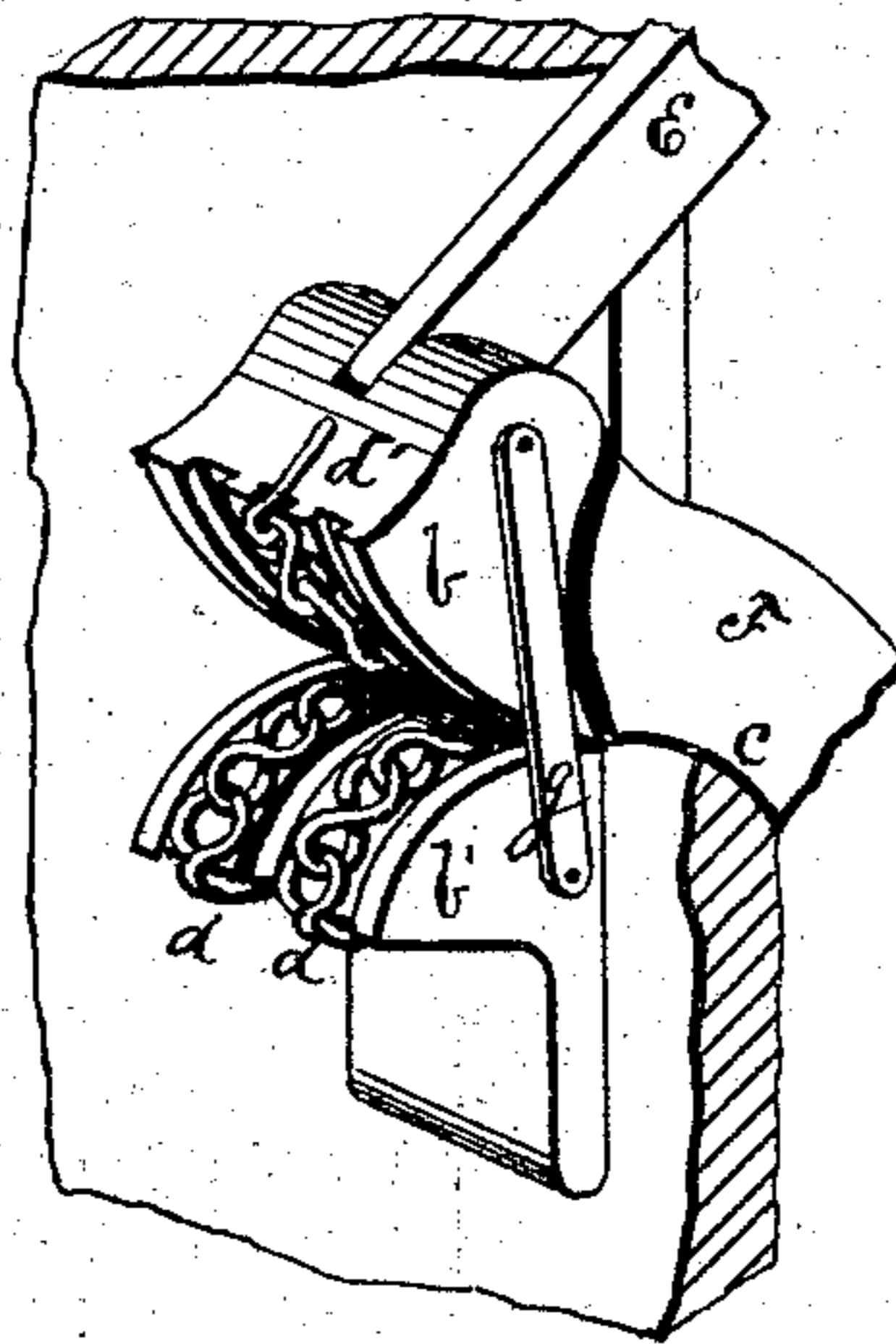


FIG. 3.

WITNESSES.

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THOMAS S. GREENMAN, OF STONINGTON, CONNECTICUT.

IMPROVEMENT IN PAPER-CUTTING MACHINES.

Specification forming part of Letters Patent No. **156,217**, dated October 27, 1874; application filed September 7, 1874.

To all whom it may concern:

Be it known that I, THOMAS S. GREENMAN, of Stonington, in the county of New London and State of Connecticut, have invented certain new and useful Improvements in Paper-Cutting Machines; and I do hereby declare that the following specification, taken in connection with the drawings making a part of the same, is a full, clear, and exact description thereof.

My invention relates to certain improvements in the construction and combination of mechanism for actuating a pendent longitudinally-vibrating knife-bar, whereby certain advantages accrue, involving economy in construction, operation with comparatively little power, and economy in the space occupied by the machine, as hereafter fully described.

In the drawings, A represents the frame of the machine. B is the table upon which the paper to be cut is placed, and which is to be compressed and held in position by clamps in the usual way. C is the knife-bar, mounted in the usual way in the frame and suspended from it by the links *a a*. D is the knife attached to the knife-bar, and E is a link-connection which at one end is pivoted to the knife-bar, and at the other end to the head of the peculiarly-shaped lever F, presently to be referred to. The effect of the combination of the operating-lever F, the link E, and the knife-bar C is, in this as in other machines for this purpose, to give a draw-cut movement to the knife in passing through the pile of papers to be cut. The lever F extends through a slot in the frame A, and has a segmental head-piece, *b*, (shown clearly at Fig. 3,) and which latter is adapted to roll on a stationary segmental fulcrum, *b'*, secured to the inner face of the upright of the frame. It is also bent or made curved at *c*, to enable it, when the knife-bar is elevated, to hang downward and near to the frame.

As heretofore constructed, the operating-lever and fixed fulcrum were each provided with teeth, resembling in each instance a segment-gear. Such geared connections necessarily operate with considerable friction, and one object of my invention is to so connect the lever and fulcrum that the movement of the lever on the fulcrum will be smooth, uniform,

and with comparatively little friction. This I accomplish by employing smooth curved faces and a stop or chain connection, after the manner of the well-known two-way strap-hinge, the fulcrum and lever being stayed by side links.

In the drawings, *b* denotes the curved head of the lever F, and *b'* the curved face of the fulcrum. The straps are shown at *d*, alternately secured at their ends to the fulcrum and to the lever, as shown. Bearing-faces on both fulcrum and lever are shown at *d'* on each side of grooves occupied by the chains. The side links are shown at *g*. The curve of the face of the fulcrum may be largely varied without regard to the curve on the bearing-face of the lever, and therefore the curve on the fulcrum-face may be varied so as to secure in each machine the required movement of the cutter-bar.

In power-machines, as heretofore constructed, a counterpoise weight has been specially provided for automatically elevating the knife-bar after each cut. In such machines the said weight has been attached to the main operating-lever. As the latter, of necessity, must be of sufficient bulk or strength to resist the operative strain thereon, the avoirdupois of the weights is wholly in excess of what is requisite in the lever. Again, in lever-machines heretofore operated by a windlass and chain the latter does not have a direct lift on the lever; but when the lever is at its lowest point the chain stands, when tight, in an inclined line from the lever to the windlass, and as the lever is raised the chain assumes a vertical line, and then, as the lever rises still farther, the chain is more or less inclined in the opposite direction. This constant change of draft-line is attendant with considerable loss of power; and one feature of my invention consists in combining with the lever a segment of a wheel-rim, over the edge of which the chain passes, and to the lower end of which it is attached, whereby the draft on the chain is always in a vertical line, regardless of the position of the lever, and, while obtaining this result, I obviate the employment of "dead" metal in the form of a weight, the segment serving as a counterpoise. In other words, by my said improvement, what has heretofore been employed merely as a weight is so utilized as to afford a continuous direct strain on the lever-chain.

In this instance the machine represented is intended to be driven by power. Accordingly the end of the lever F is furnished with a segment, G, of a wheel-rim, and a strap, *e*, is attached to such rim at one end, the other end being secured to and wound around a loose drum on the shaft *f*, Fig. 2. This drum can be connected, by means of a clutch-box, *h*, with the driving-shaft *f*, which latter receives its motion from the prime mover H, through gear-wheels *k k'*. The machine should be arranged so that the clutch-coupling will be opened automatically after the knife-bar has descended to its lowest point, when the lever-arm F, acting as a counterweight, causes the knife-bar to be elevated again. A lever, I, enables the operator to connect the two parts of the clutch-coupling, and start the machine again at pleasure. The shafts *f* and H are mounted in bearings set in brackets attached to the frame of the machine, as clearly shown in the drawing.

From the foregoing description and from an inspection of the drawing, it is evident that the form of the segmental headed lever F and the location of its fulcrum upon the inner face of the upright standard of the frame enable

the shafts *f* and H to be set much nearer to the side of the frame than would otherwise be possible, and consequently, while the necessary length of leverage is preserved, the machine is made more compact and will occupy less floor space.

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

1. In a paper-cutting machine, the combination, with a longitudinally and vertically operated cutter-bar, of an operating-lever and a fulcrum, both of which are provided with reversely-curved bearing-surfaces, and which are connected by the straps or chains and side links, substantially as described.

2. The combination, with the windlass lever-chain and the operating-lever, of the segment G, the latter operating as a counterpoise weight for the lever, and also as a means for maintaining a uniform draft-line on the lever-chain, substantially as described.

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Witnesses:

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