

W. H. Tolman,
Paper Cutter.

No. 111,702.

Patented Feb. 7, 1871.

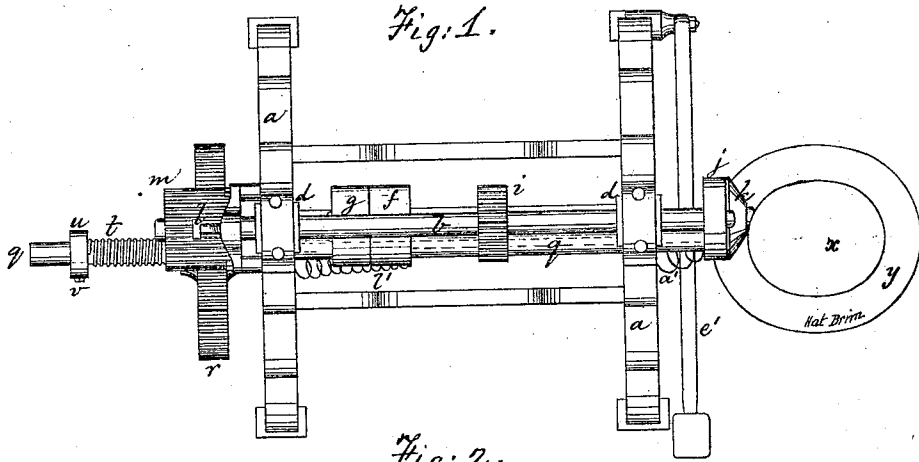
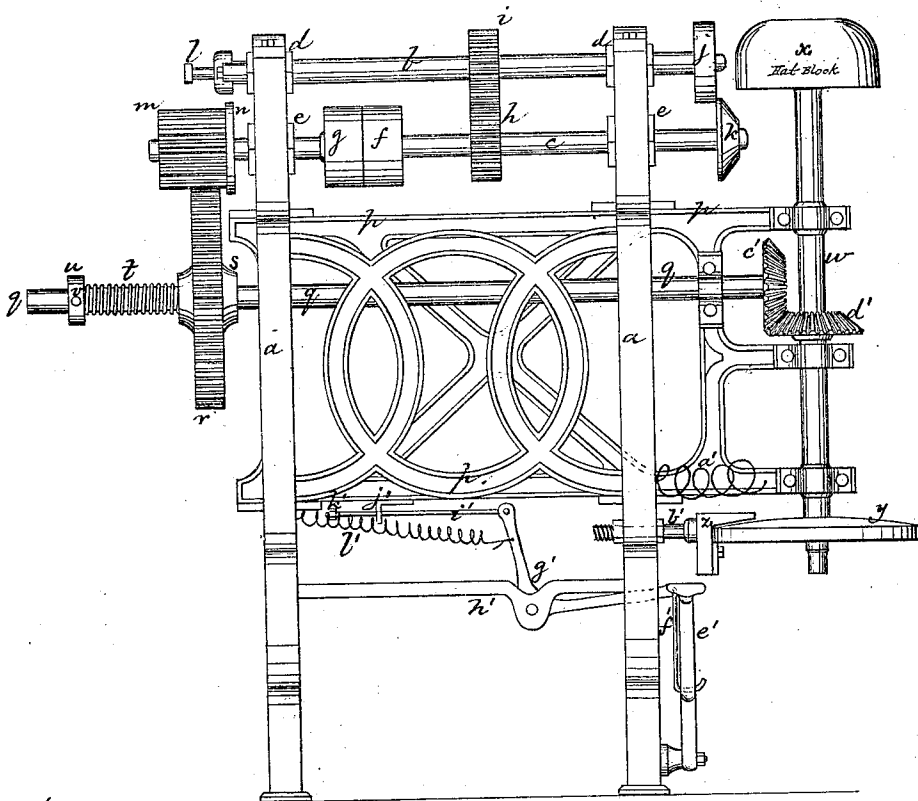


Fig. 2.



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Fig. 4. A, a1

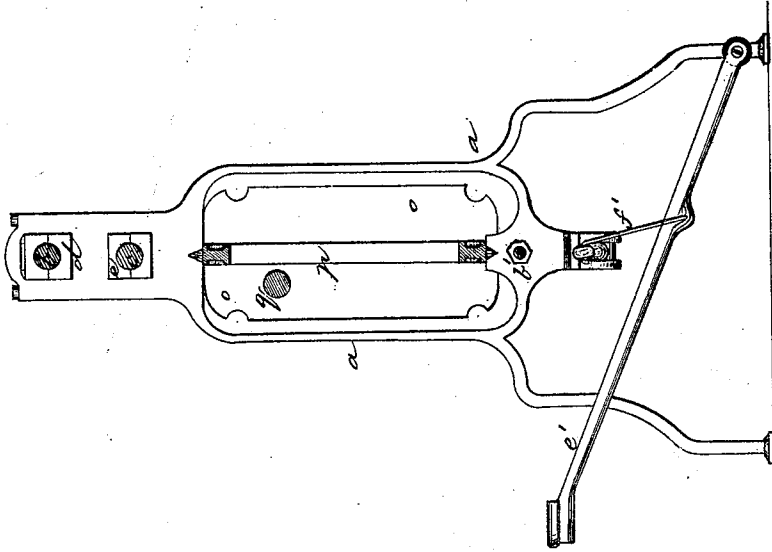
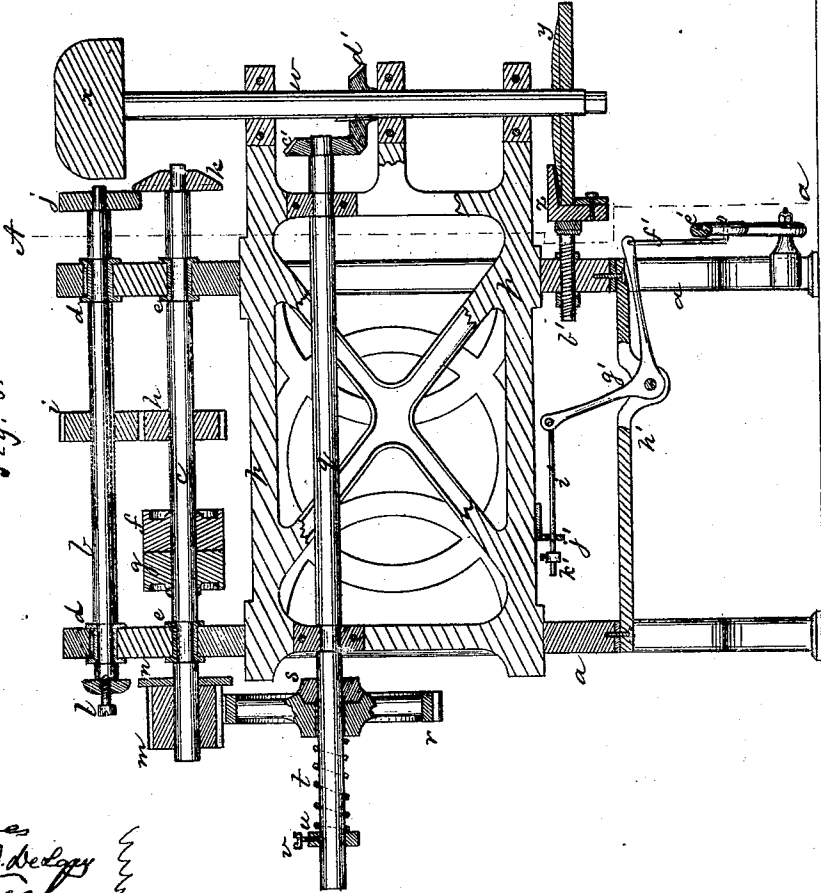


Fig. 3.



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WILLIAM H. TOPHAM, OF NEW YORK, N. Y.

Letters Patent No. 111,702, dated February 7, 1871; antedated February 1, 1871.

IMPROVEMENT IN PAPER-CUTTING MACHINES.

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, WILLIAM H. TOPHAM, of the city, county, and State of New-York, have made certain new and useful Improvements in Machines for Trimming the Edges of various articles made of Paper or other material; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings making part of this specification, in which—

Figure 1 is a plan view;

Figure 2, a side elevation;

Figure 3, a longitudinal vertical section; and

Figure 4, a cross-vertical section at the line A *a* of fig. 3.

The same letters of reference indicate like parts in each of the figures.

In the annexed drawings—

a represents a suitable frame for supporting the working parts of the machine.

In the upper part of this frame there are two horizontal shafts, *b* *c*, placed directly over each other, and having their bearings in boxes *d* *e* in the standards of the frame.

The lower shaft *c* carries a fast-and-loose pulley, *f* *g*, to the former of which any suitable power can be applied by means of a belt to operate the machine; and this shaft also carries a cog-wheel, *h*, which engages another cog-wheel, *i*, of equal diameter, on the upper shaft *b*, thus causing the two shafts to turn in opposite directions and with equal velocity.

To the forward end of each of these shafts there is attached, in any suitable manner, a circular cutter, *j* *k*, made of steel, to operate upon the desired article to be trimmed or cut; and for the purpose of always insuring the contact of these cutters, the rear end of the shaft *b* is provided with a set-screw, *l*, by means of which the cutter *j* is kept closely pressed against the lower cutter *k*.

The lower shaft *c*, at its rear end outside the frame, is provided with a wide gear-wheel, *m*, the inner face of which is formed with or provided with a flange, *n*, of somewhat larger diameter, for a purpose to be presently described.

The standards of the frame *a* are made with openings or spaces, *o*, of sufficient width to permit a frame, *p*, to slide freely back and forth longitudinally on V-shaped guides, which fit into corresponding grooves in the said standards of the frame, as shown clearly in fig. 4.

This sliding frame *p*, near its upper part, carries a horizontal shaft, *q*, in suitable bearings; and to the rear end of this shaft is loosely fitted a cog-wheel, *r*, which engages the wide gear-wheel *m* before described.

On this shaft *q* there is secured permanently a be-

veled friction-clutch, *s*, which fits in a corresponding recess made in the hub of the cog-wheel *r*, and which, when the machine is in operation, constantly engages the said cog-wheel by means of a spring, *t*, interposed between the cog-wheel and a collar, *u*, on the shaft, and thereby gives motion to the vertical shaft (to be presently described) which carries the chuck on which the article to be cut or trimmed is to be placed.

The tension of the spring *t* which forces the cog-wheel *r* firmly against the clutch *s* can be regulated by the set-screw *v* in the collar *u*.

The forward end of the sliding frame *p* projects a short distance in front of the frame *a*, and carries a vertical shaft, *w*. This shaft is movable up and down in its bearings, and at its upper end there is attached a chuck, *x*, of any suitable form, and on which is to be placed the article to be cut or trimmed.

To the lower end of this movable shaft is secured a pattern or former, *y*, of a form corresponding with that which the article to be trimmed is intended to assume.

Motion is given to the movable shaft which carries the pattern and the article to be trimmed, by means of a bevel-gear wheel, *c'*, on the forward end of the horizontal shaft *q*, which engages another bevel-wheel, *d'*, on the movable shaft. This shaft is made to slide up and down through the bevel-wheel *d'*, and is provided with a feather to transmit motion from the pinion to the shaft. The object of this sliding motion of the shaft *w* is that the point of the article to be cut or trimmed will always be presented on a horizontal plane with the cutting point of the cutters. In trimming an article like a hat-brim, where there is an upward curve as well as an oblong, if this shaft was stationary and not capable of adapting itself to the peculiar form of curve, some parts of the brim would be above the cutting point and some below; but the shaft having this vertical sliding motion, and the pattern or former having the same form with that which the article to be trimmed is intended to assume, all parts of the brim will be brought in a plane with the cutting point.

The former is made constantly to bear, against a guide-plate, *z*, (or a roller may be substituted,) by means of a spring, *a'*, one end of which is secured to the sliding frame *p* and the other end to the frame *a*.

This guide-plate *z* is provided with a stem, *b'*, which passes through a hole in the forward standard of the frame *a*; and it can be placed at a greater or lesser distance from the main frame to suit different-size patterns, and is secured in its proper position relative to the pattern in use by means of a screw-thread and nut on the rear end of its stem.

When the cutters are in operation, the chuck is

brought up as close to them as possible in order to give that part of the article to be trimmed, say the rim of a hat, the requisite support for the proper action of the cutters. But when it is necessary either to place the article on the chuck to be trimmed or to remove it after being trimmed, the chuck is to be moved away from the cutters, and its motion ceases to facilitate these operations.

This result is produced by means of a treadle, *e*, turning on a stud-pin attached to the forward standard of the main frame, and connected by a rod, *f*, with one arm of a lever, *g*, which has its fulcrum in a bar, *h*, attached to the main frame, the other arm of the said lever having a rod, *i*, attached to it, which passes through a hole in a plate, *j*, secured to the bottom of the sliding frame *p*, and provided at its rear end with a collar or nut, *k*.

It will be seen from the above arrangement that when the treadle *e* is pressed down by the foot of the attendant, the collar *k* is forced against the plate *j*, which is secured to the bottom of the sliding frame *p*, thereby carrying forward the said frame, the chuck, and all the other working parts connected with it; and this forward motion of the sliding frame *p* brings the inner face of the cog-wheel *r* in contact with the flange *n* on the wide gear-wheel *m*; and the pressure against the said flange, produced by the continued downward motion of the treadle, disengages the said cog-wheel *r* from the beveled friction-clutch *s*, so that it can revolve freely on its shaft without transmitting motion to the vertically-sliding shaft which carries the chuck and former or pattern.

After the article to be trimmed has been properly placed upon the chuck, the treadle is relieved from the pressure upon it, and is brought to its proper elevated position by means of a spring, *l*, one end of which is secured to one arm of the lever *g*, and the other end to the main frame; the sliding frame *p*, with

all its working parts, is drawn back by means of the spring *a* until the pattern or former is brought against the guide-plate *z*; the cog-wheel *r* is forced to engage the beveled clutch *s* by means of the spring *t*; and the machine is then ready for operation.

The pattern or former on the lower end of the vertical shaft *w* must in all cases (other than when a true circle is required to be cut) correspond with the shape it is designed to trim the article on the chuck; and as it is kept in constant contact with the guide-plate *z* by the spring *a*, and it is attached to the vertically-sliding shaft which also carries the chuck and article to be trimmed, and the shaft is supported in the sliding frame *p*, it follows that the sliding frame will have a motion forward and backward in unison with the peculiar form of pattern used, and thus the rotary cutters will trim the article on the chuck to the exact shape of the pattern.

If it should be desired to cut or trim an article to a circular form, a pattern will not be required; it will simply be necessary to stop the backward motion of the sliding frame at such a point as will give the required diameter to the article, and this can be effected by a pin or dog, or any simple mechanical device.

Having thus fully described my invention,

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

1. The combination of the rotary cutters with the sliding frame *p* and vertically-sliding shaft *w* which carries the chuck and former or pattern, as herein set forth.
2. The combination of the sliding frame *p* with the clutch *s*, the gear-wheel *r*, and flange *n*, as herein set forth.

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Witnesses:

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