2 Sheets—Sheet 1.

L. HOUSTON.

MOLDING-MACHINE.

No. 171,134. Patented Dec. 14, 1875.

FIG. 1.

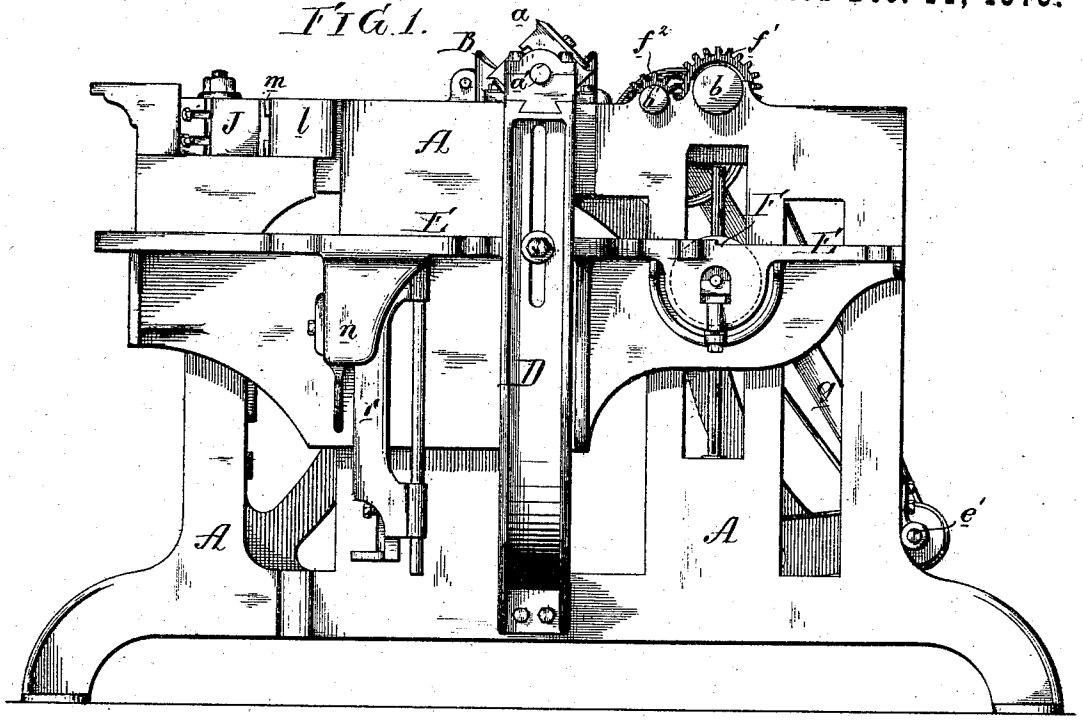
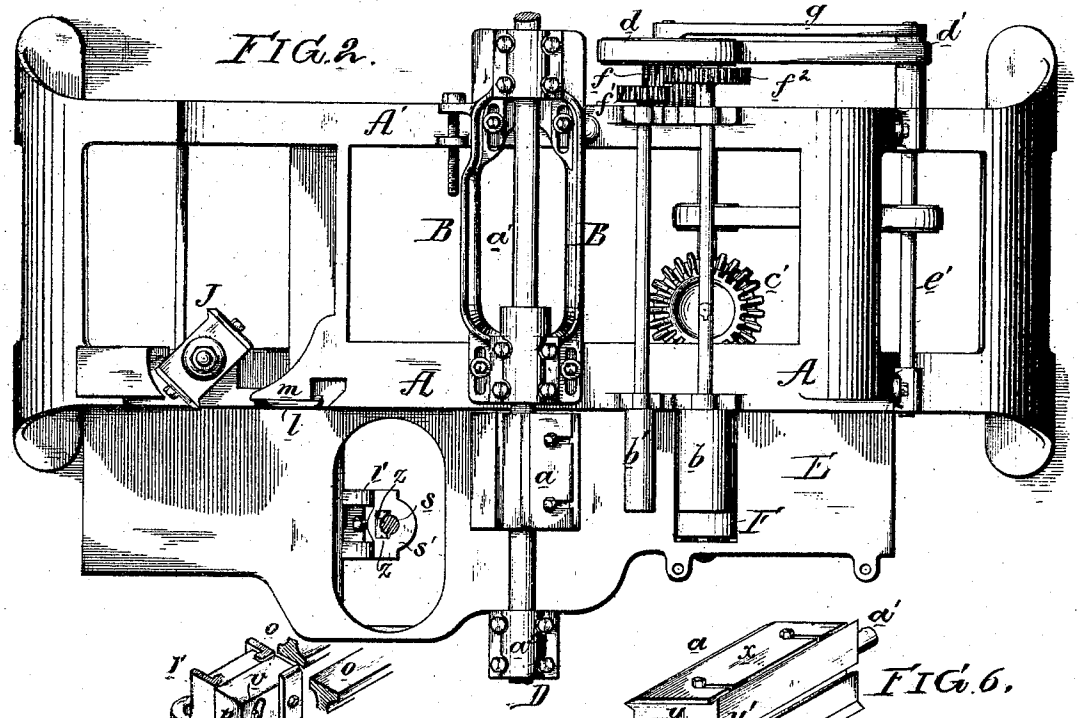


FIG. 2.



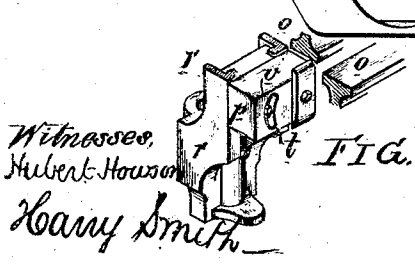


FIG. 5.

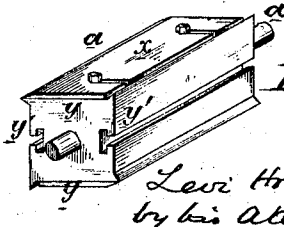


FIG. 6.

Witnesses,
Hubert Houston
Harry Smith

Levi Houston
by his Attorneys
Howson and Sons.

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

2 Sheets—Sheet 2.

L. HOUSTON.

MOLDING-MACHINE.

No. 171,134. Patented Dec. 14, 1875.

FIG. 3.

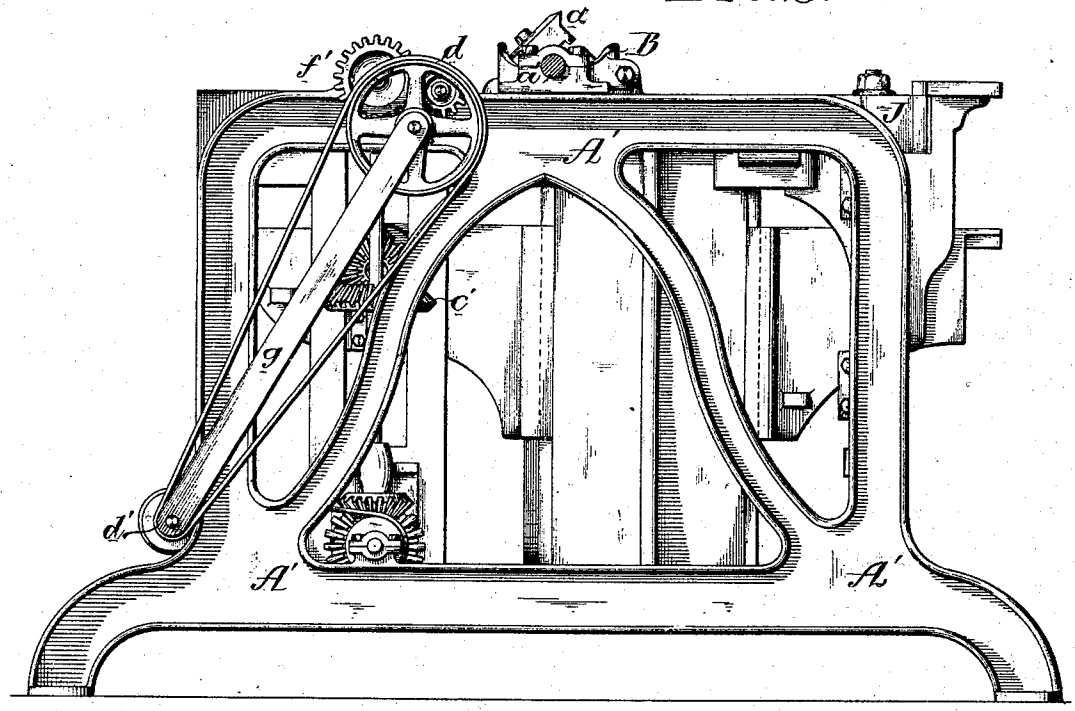
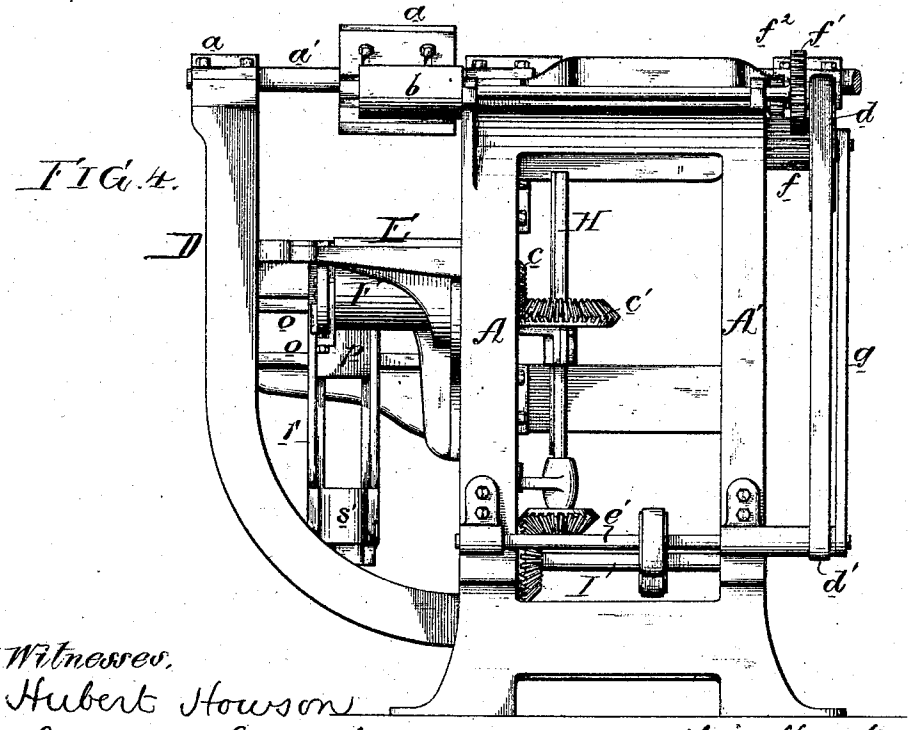


FIG. 4.



Witnesses.
Hubert Howson
Harry Smith.

Leis. Houston
by his Attys.
Howson and Son.

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

LEVI HOUSTON, OF MONTGOMERY, PENNSYLVANIA.

IMPROVEMENT IN MOLDING-MACHINES.

Specification forming part of Letters Patent No. **171,134**, dated December 14, 1875; application filed November 24, 1874.

To all whom it may concern:

Be it known that I, LEVI HOUSTON, of Montgomery, Lycoming county, Pennsylvania, have invented certain Improvements in Molding-Machines, of which the following is a specification:

The object of my invention is to so construct a molding-machine that it will be more effective in its operation than those in common use; and this object I attain in the manner which I will now proceed to describe, reference being had to the accompanying drawings, in which—

Figure 1, Sheet 1, is a front view of the machine; Fig. 2, a plan view; Fig. 3, Sheet 2, a rear view; Fig. 4, an end view; and Figs. 5 and 6, Sheet 1, perspective views of parts of the machine.

A A′ are the side frames of the machine, and are suitably connected together. The horizontal cutter *a* is secured to a shaft, a^1, which turns in bearings formed in a head-stock, B, so secured to the opposite side frames of the machine as to be adjustable thereon, and the outer end of this shaft is adapted to a bearing, a^2, in the upper end of a curved arm or standard, D, secured to the side frame A at the base, and extending outside of the work-table E, which is also secured to the said frame. A bearing in the side of this table carries the shaft of the lower feed-roller F, which receives its motion, through the medium of bevel-wheels *c* and *c′*, from the vertical shaft H, driven by the main shaft I. The upper feed-rollers *b* and *b′* turn in suitable bearings in the frame A, and are of different diameters, for a purpose explained hereafter. These rollers *b* and *b′* receive their motion, through the medium of cog-wheels f^1 and f^2, from a cog-wheel, *f*, on a shaft, *e*, which is provided near its outer end with a pulley, *d*, for receiving a belt from a pulley, *d′*, on a shaft, *e′*, the latter receiving its motion from the driving-shaft. The shaft *e′* turns in bearings on the frame-work of the machine, and is connected by a rigid bar, *g*, to the shaft *e*, the object of which is to prevent the belt from drawing the shafts out of line. On referring to Fig. 1 it will be seen that the upper surface of the work-table E is slightly depressed at and near its outer end below the level of the rest of the table. This depression extends to about the center of the lower feed-roller F, and its object is to prevent that excessive friction in front of the feed-rolls which is caused by the contact of the work with the surface of the table. The inside cutter-head J is attached to a vertical shaft revolving in bearings near the end of the machine, and receiving its motion by means of belts and pulleys from the vertical shaft H. Adapted to guides *m* on the frame A is a sliding plate or chip-breaker, *l*, (see Figs. 1 and 2,) which can be so adjusted in relation to the cutting-edges of the cutter-head J as to support the work close up to the edge of the cutter, and prevent the chipping or splintering of the same, without regard to the size of the cutter-head which is employed.

With some classes of work it is necessary to employ an intermediate cutter for operating on the work in its passage from the horizontal cutter *a* to the inner cutter J, and one feature of my invention relates to a universal bearing for such a cutter-head, and is illustrated in Figs. 1, 2, 4, and 5 of the drawings.

The table E has an extension, *n*, and from this extension to the side frame A project two guides, *o o*, (see Figs. 4 and 5,) to which is adapted the sliding block *p*, carrying a vertical sliding frame, *r*. To bearings on this frame is adapted the shaft *s*, which carries the intermediate cutter-head. Set-screws are so combined with the sliding block *p* and frame *r* that the cutter can be secured in any position, either vertical or horizontal, to which it may be adjusted, and provision for diagonal adjustment is provided by means of a curved slot, *t*, in the sliding block *p*, to which is adapted a set screw, *v*, secured to the sliding frame *r*. It will be seen on reference to Figs. 1 and 2 that the bearings *s′* of the shaft *s* are formed in one piece with the sliding frame *r*, each bearing being provided with a sliding block, *z*, adjustable by means of a set-screw. By this means the strain of the shaft *s* is resisted by a solid backing, the wear of the bearing being compensated for by adjusting the sliding block *z*.

Another feature of my invention is shown in the perspective view, Fig. 6; and consists in forming two sides, *y*, of the cutter-head plain, the two remaining sides, *y′*, being slotted in the usual manner. The object of this con-

struction is to afford a firm backing for the cutting-plates *x*, when heavy work is being performed by the machine, the cutting-plates being, in such case, secured to the solid face of the cutter.

On referring to Fig. 1, it will be seen that the upper feed-rollers *b b'* are of different diameters, the two being so geared, however, that they work in unison. By this arrangement I secure a firm gripe on the work that is being fed, and am able to arrange one of the rollers close up to the cutter, and thus prevent all objectionable upward strain on the head *a*.

An important feature of my invention is the standard D, carrying the bearing a^2 for the cutter-head *a;* this standard not only affording a firm bearing for the outer end of the cutter-shaft, but serving also to support the work-table E at a point immediately beneath the cutter, where the table is in most need of a substantial support.

The bearing a^2 is adapted to a dovetailed groove formed in the upper portion of the frame D, so that it can be readily detached when a change of cutter-heads becomes necessary.

I claim as my invention—

1. The combination, in a molding-machine, of the vertically-adjustable work-table E and the standard D, secured to the frame below the table, and provided at the top with a bearing for the spindle of the outside cutter-head, as set forth.

2. The work-table E, of a uniform height at both sides of the cutter, and depressed at and near one end, as and for the purpose set forth.

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

LEVI HOUSTON.

Witnesses:
WM. SEDAM,
WM. MACKEY.