3 Sheets—Sheet 1.

M. & R. W. MURPHY.

BAG-MACHINE.

No. 186,866. Patented Jan. 30, 1877.

FIG. 1.

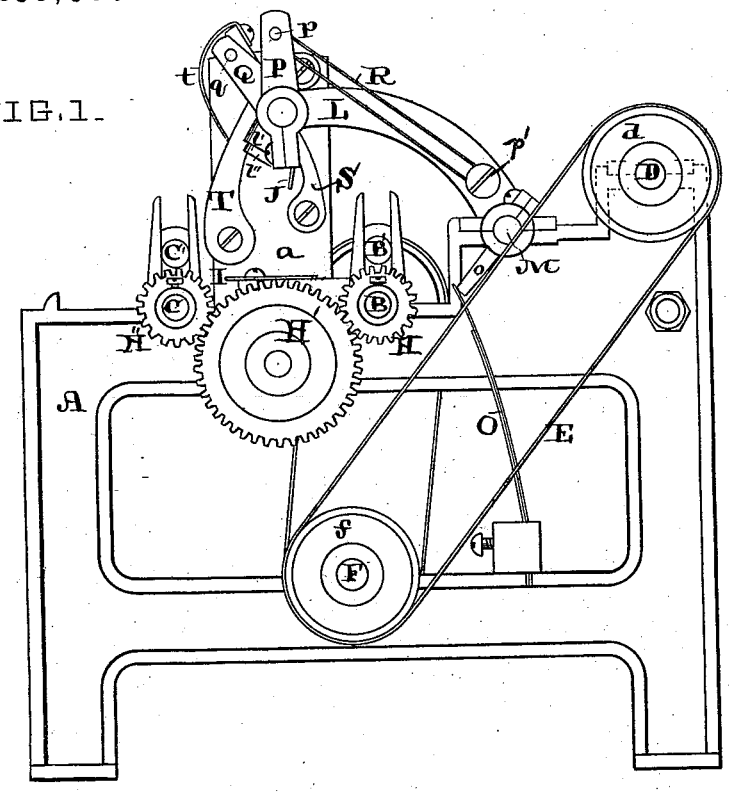
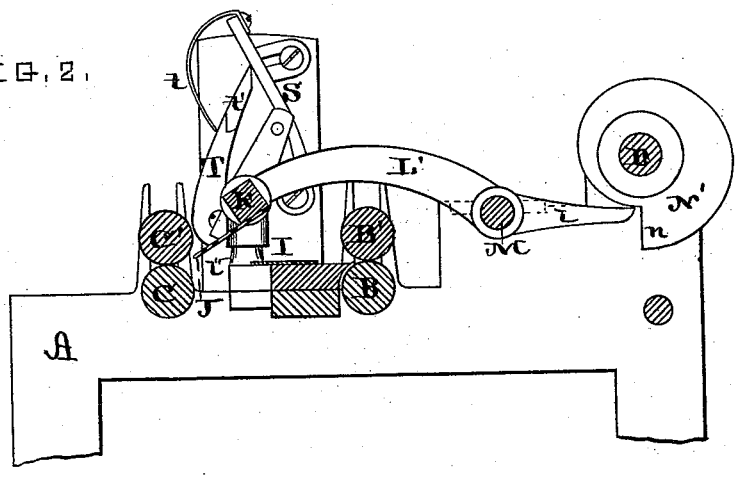


FIG. 2.



WITNESSES.

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by Chas. D. Moody.
their atty.

3 Sheets—Sheet 2.

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FIG. 3.

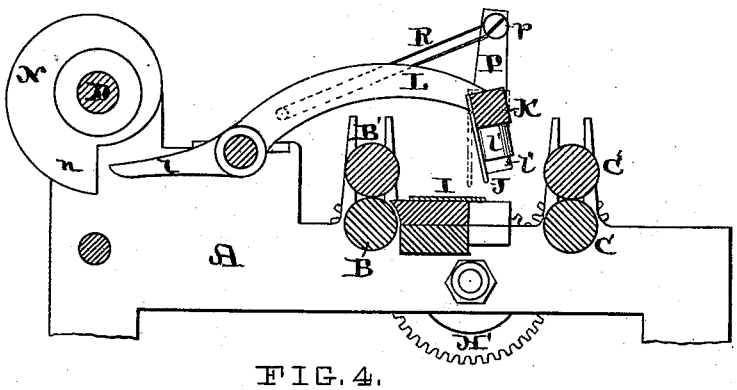


FIG. 4.

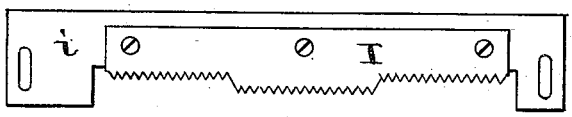


FIG 5

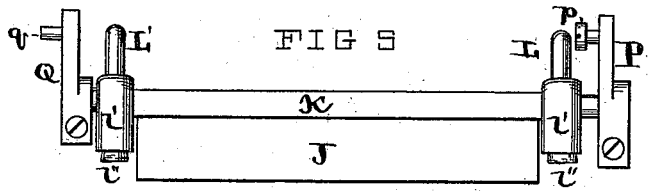


FIG. 6.

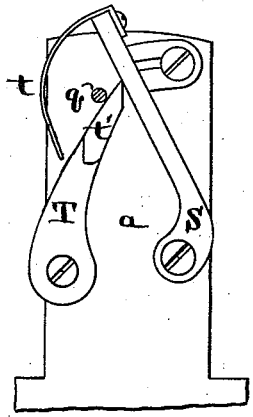
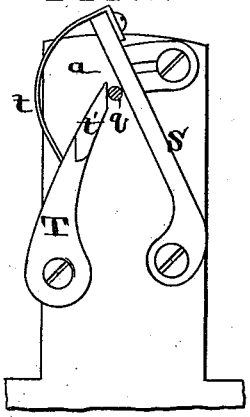


FIG. 7.



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3 Sheets—Sheet 3.

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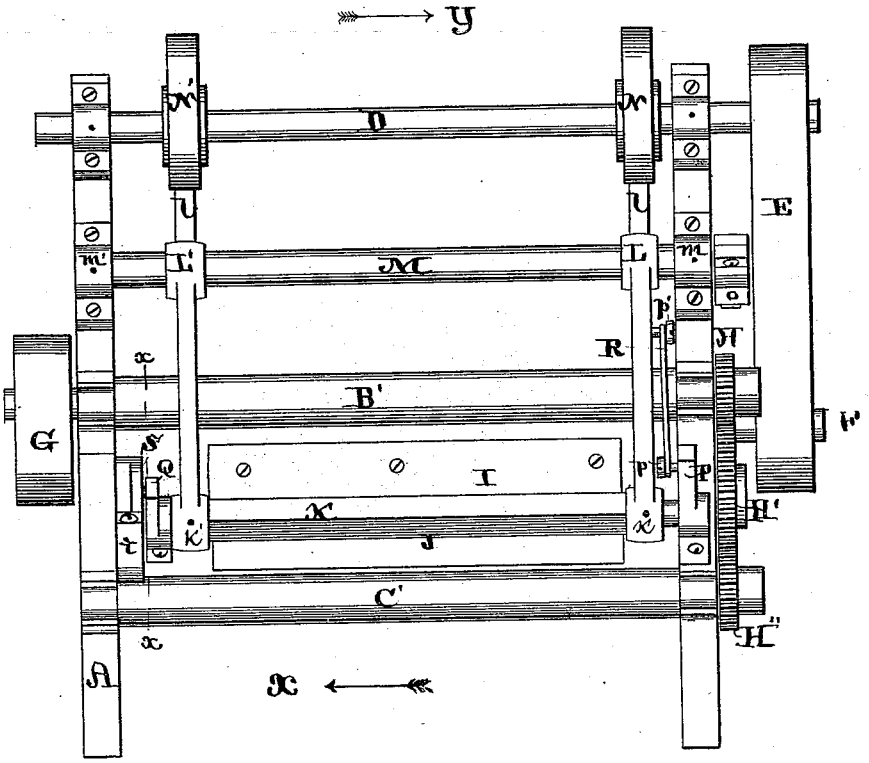
FIG. 8.



WITNESSES

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Paul Bakewell

INVENTORS.

Merrick Murphy,
Rufus W. Murphy,
by Chas. D. Moody.
their atty!

UNITED STATES PATENT OFFICE.

MERRICK MURPHY AND RUFUS W. MURPHY, OF ST. LOUIS, MISSOURI; SAID RUFUS W. MURPHY ASSIGNOR TO M. F. MURPHY, OF SAME PLACE.

IMPROVEMENT IN BAG-MACHINES.

Specification forming part of Letters Patent No. **186,866**, dated January 30, 1877; application filed December 23, 1876.

To all whom it may concern:

Be it known that we, MERRICK MURPHY and RUFUS W. MURPHY, of St. Louis, Missouri, have made a new and useful Improvement in Paper-Bag Machines, of which the following is a full, clear, and exact description, reference being had to the annexed drawing, making part of this specification, in which—

Figure 1 is a side elevation of a machine embodying our improvement; Fig. 2, a central vertical longitudinal section, looking in the direction of the arrow X of Fig. 8; Fig. 3, a similar section, looking in the direction of the arrow Y, Fig. 8; Fig. 4, a plan of the lower or fixed knife and its immediate support; Fig. 5, a view of the movable knife and parts immediately therewith connected; Fig. 6, a vertical longitudinal section on the line *x x* of Fig. 8, looking in the direction of the arrow X, Fig. 8, and showing the parts as when the movable blade is beginning to descend; Fig. 7, the same view as that of Fig. 6, but showing the parts as when the movable blade is being raised, and as nearly to its highest point; and Fig. 8, a plan.

Similar letters refer to similar parts.

The present invention relates to the cutting mechanism of a paper-bag machine.

In the annexed drawing, A represents a portion of the frame of a paper-bag machine, similar to that described in Letters Patent No. 135,145, granted Merrick Murphy, one of the parties hereto, January 21, 1873, it being that end of the machine to which the paper is delivered. B B′ and C C′ represent the usual pairs of rolls that feed the paper, and that are arranged, respectively, in front of and beyond the point where the paper is cut. D represents the driving-shaft, having a pulley, *d*, over which a belt, E, leads to a pulley, *f*, on a shaft, F. From a pulley on the latter a belt, G, leads to a pulley on the roll B, and by means of the gearing H H′ H″ the motion is further communicated to the roll C. The cutting mechanism is of that class wherein a movable blade strikes past a fixed blade, over which the paper is being drawn. I represents the fixed blade, being preferably serrated and of suitable configuration. It is arranged between the rolls B B′ and the rolls C C′, and in a plane parallel with that in which the paper is moving, or nearly so, its cutting-edge being preferably slightly raised for the paper to draw against. J represents the movable blade. It has a peculiar reciprocating movement past the edge of the fixed blade—that is, starting from a position wherein it is nearly or quite at right angles to the fixed blade, it strikes directly downward in front of and past the latter, severing the paper. It then turns into, or nearly into, a horizontal position, as shown in Fig. 2, to keep out of the way of the following web of paper. It is then raised to its original starting-point, (indicated in Fig. 1,) and during its upward movement, and preferably after it has been lifted far enough to be entirely out of the way of the paper, it is turned backward again into the vertical, or nearly vertical, position first above mentioned. To effect this movement the following mechanism is employed: The movable blade J is held in a head, K, that, in turn, is supported by two arms, L L′. The latter are attached to a shaft, M, that is arranged in suitable bearings *m m*, in the frame A. The driving-shaft D is provided with cams N N′, that bear, respectively, upon extensions *l l* of the arms L L′. As the shaft D rotates, the extensions are depressed, and the blade J raised until the projections *n n* of the cams have passed the extensions. The blade J then falls, partly from gravity; but to make it move promptly and strike sharply down, we preferably arrange a spring, O, to bear upon an arm, *o*, that is attached to the shaft M. The means thus far described provide for the up-and-down movement of the movable blade and the cutting of the paper; but to secure the turning of the movable blade into or toward a horizontal position after the paper is cut, the slight elevation of it while thus turned, and then the restoring of it to its original inclination, the further means are brought into requisition. The blade-head K is arranged to turn in bearings *l′ l′* at the points of its connection with the arms L L′, and at each end, and, respectively, beyond the bearings *l′* and *l′*, is furnished with cranks P and Q. At the upper end of the crank P is a wrist or stud, *p*.

An elastic connection, preferably a rubber band, R, extends from this stud *p* to another stud, *p'*, on the arm L, and serves to draw the upper end of the crank P in such a way as to throw the edge of the movable blade in the direction of the movement of the paper, except when it is counteracted by some other means. For this purpose the crank Q is also provided with a wrist or stud, *q*, which, as the blade J and arms L L are raised, comes against a guide, S, that is attached to an extension, *a*, on the frame A. This serves to deflect the crank Q and overcome the action of the band R. The various parts are so arranged as to deflect the upper end of the crank Q after the blade J has been raised a short distance, and so as to bring the blade into a vertical, or nearly vertical, position when it is at its extreme upward limit. Now, as the blade descends the band R would act to throw the blade immediately back into the horizontal position described, were it not for a stop, T, that is pivoted to the extension *a*, and that is constantly pressed by a spring, *t*, against the guide S. As the blade is raised the stud *q* pushes from its position, (shown in Fig. 7,) up past the top of the stop T, whereupon the latter, actuated by the spring *t*, closes against the guide S, and causes the stud *q* to fall against a projection, *t'*, on the outer side of the stop, as shown in Fig. 6. This operates to retain the blade J in the vertical position named until the blade has descended far enough to bring the stud *q* below the projection *t'*, when the band R acts to turn the blade horizontally, as described.

The movable blade may be serrated, if preferred, and the fixed blade made smooth. We prefer, however, the construction shown. One blade also may be inclined to the other, if desired, so as to produce a shearing cut.

The arms L L′ are provided with extensions *l' l'*, having rubbers *l'' l''*, that come against the plate *i* of the blade I as the blade J descends, and serve to relieve the shock.

The guide S is made adjustable on the extension *a*, and can be set at any desired inclination. The cranks P and Q are also adjustable on the blade-head K.

An especial advantage of the present construction is, that the movable blade, as soon as the paper is cut, is thrown suddenly into a horizontal position, and so as to keep in advance of the paper behind it. The distance traveled by the knife in making a cut is comparatively short, enabling it to act with great rapidity. At the same time its operation is equally effective, whether moving fast or slow.

While especially adapted to, and described in connection with, paper-bag machinery, the invention is valuable in connection with other kinds of mechanism, such as printing-presses, wherein paper is to be cut while being fed continuously past the cutting-point.

We claim—

1. The combination of the blade J, head K, crank Q, stud *q*, guide S, stop T, having the projection *t'*, spring *t*, and extension *a*, substantially as described.

2. The combination of the arms L L′, head K, blade J, crank P, studs *p* and *p'*, and band R, substantially as described.

3. The combination of the arms L L′, head K, blade J, crank P, studs *p* and *p'*, stud *q*, crank Q, guide S, stop T, having the projection *t'*, spring *t*, extension *a*, and band R, substantially as described.

4. The combination of the shaft D, cams N N′, arms L L′, shaft M, blade J, head K′, arm *o*, and spring O, substantially as described.

5. The combination of the shaft M, arm *o*, spring O, arms L L′, head K′, and blade J, substantially as described.

Witness our hands.

MERRICK MURPHY.
RUFUS W. MURPHY.

Witnesses:
CHAS. D. MOODY,
PAUL BAKEWELL.