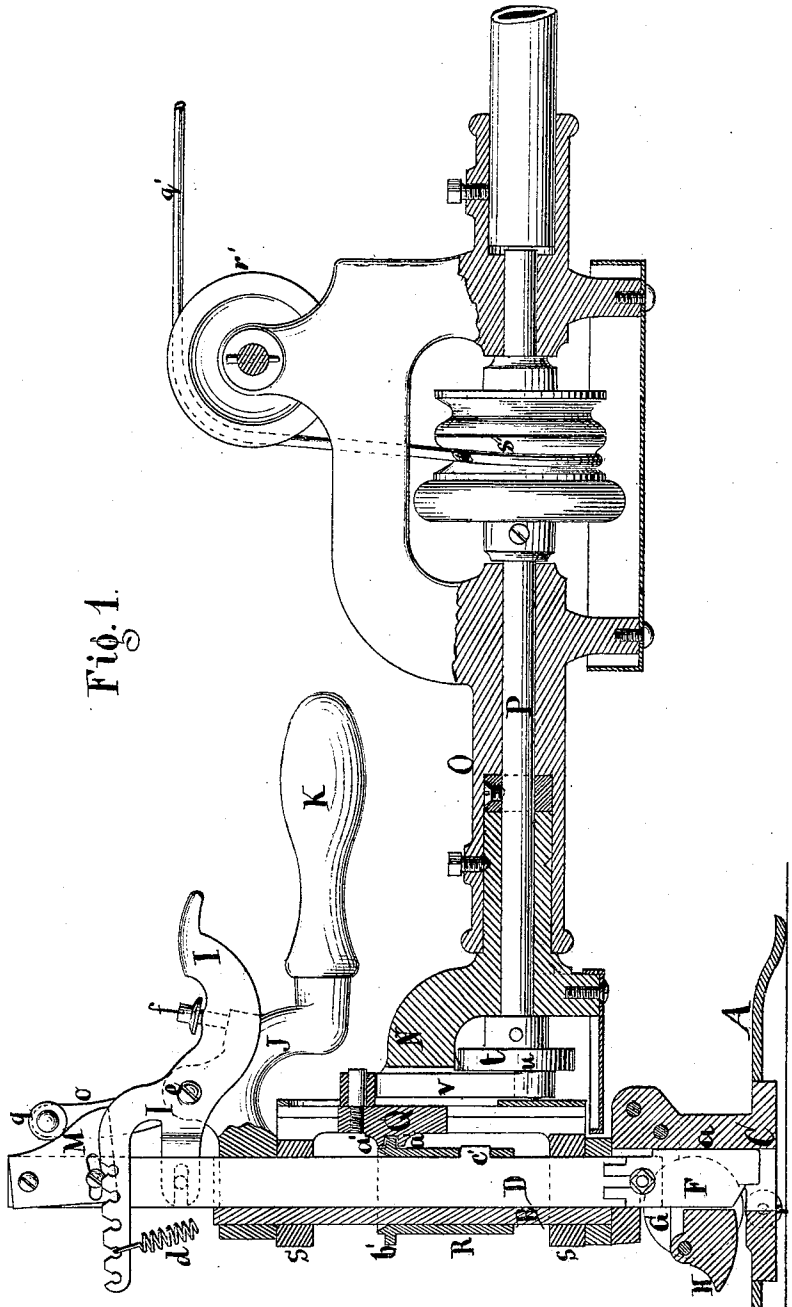
4 Sheets--Sheet 1.

A. WARTH.

Machines for Cutting Textile and other Materials.

No. 151,456. Patented May 26, 1874.

Fig. 1.



Witnesses.

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4 Sheets--Sheet 2.

A. WARTH.

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Fig. 5.

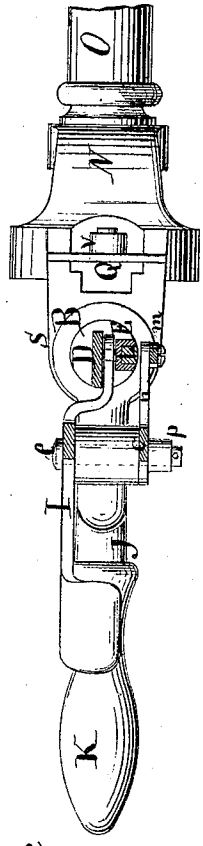


Fig. 4.

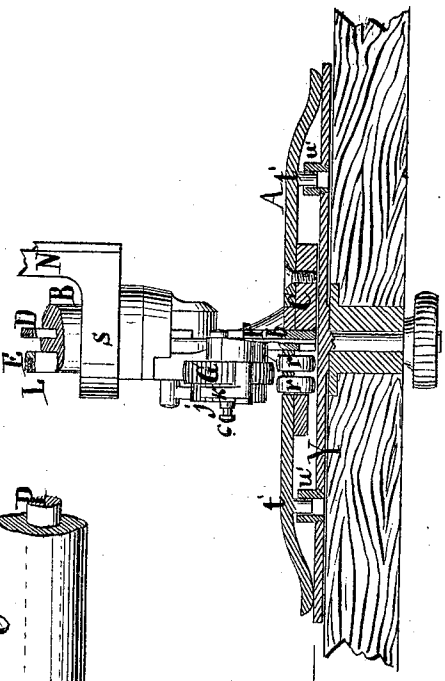
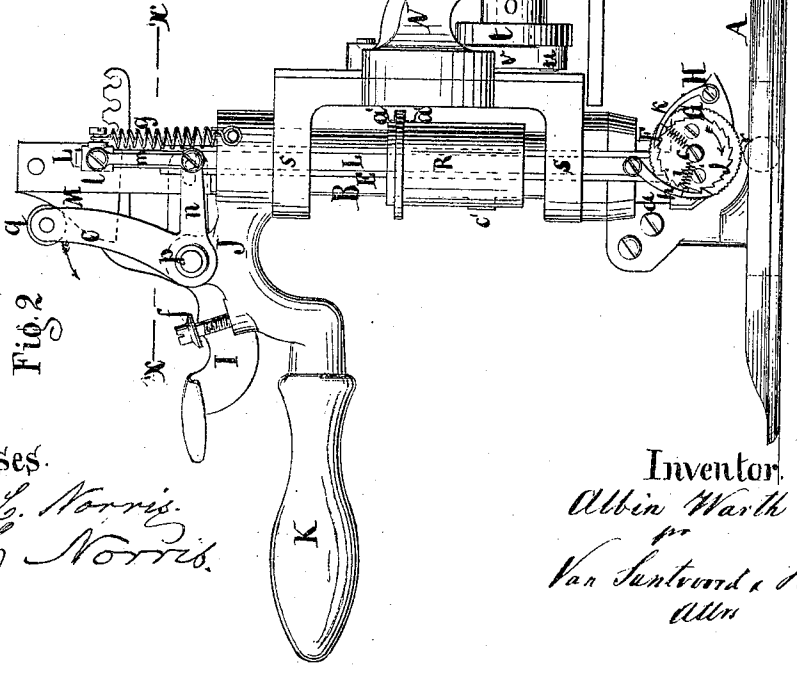


Fig. 2.



Witnesses.

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4 Sheets--Sheet 3.

A. WARTH.

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Fig. 5.

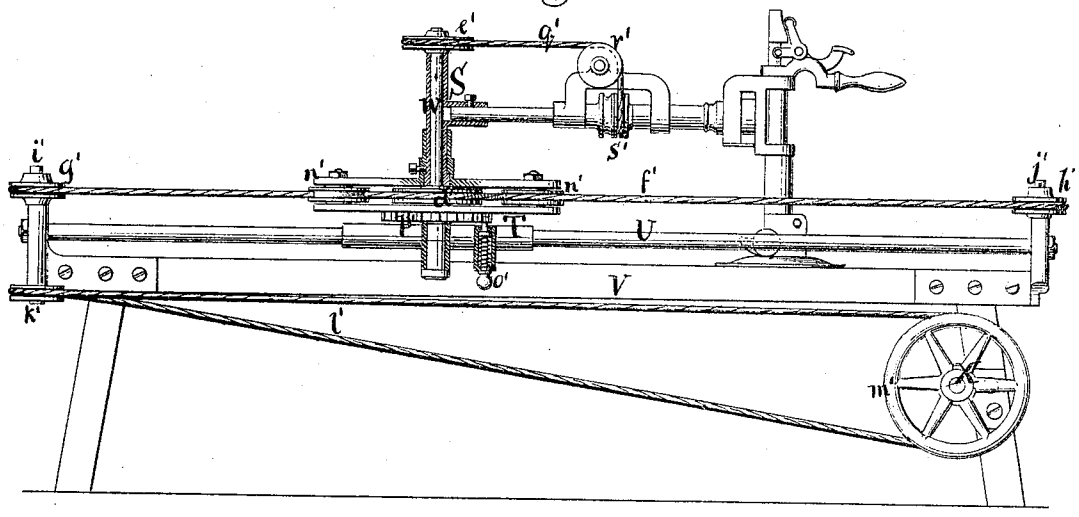
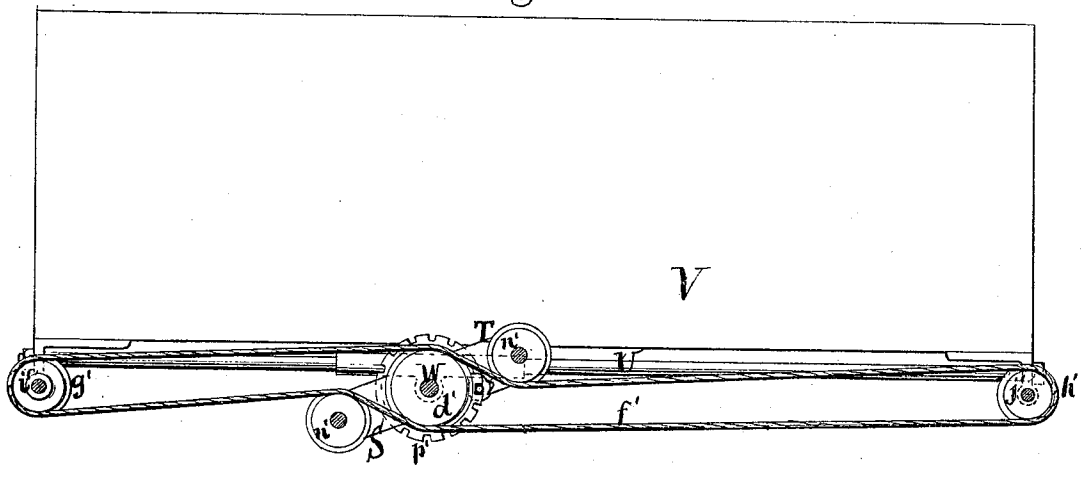


Fig. 6.



Witnesses:

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4 Sheets--Sheet 4.

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Fig. 7.

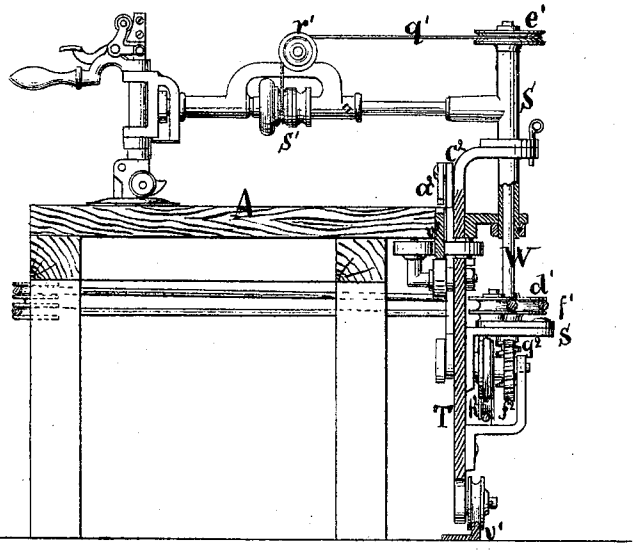


Fig. 9.

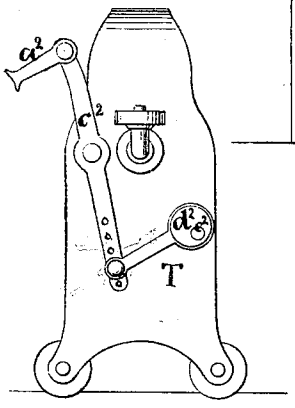
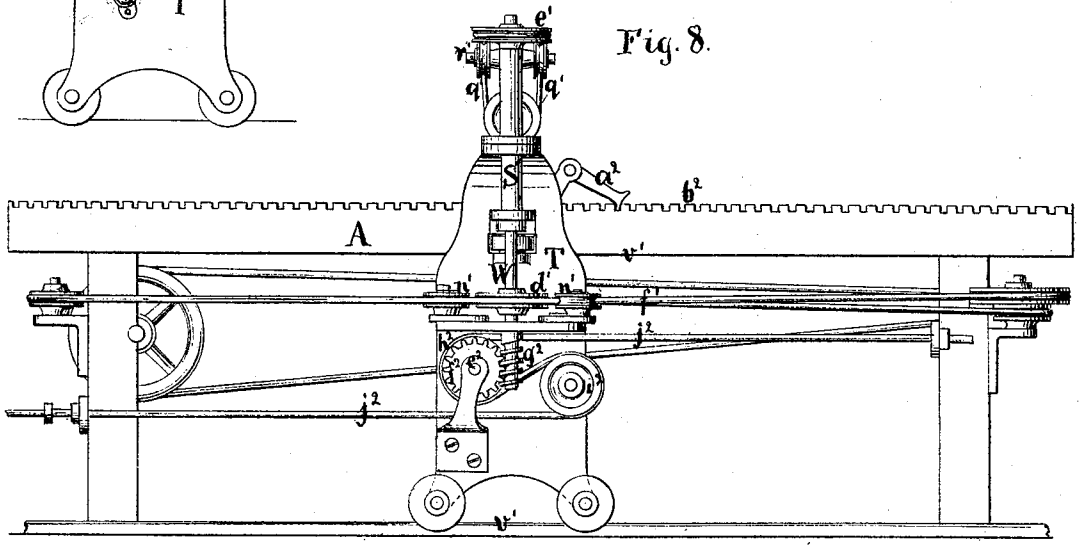


Fig. 8.



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UNITED STATES PATENT OFFICE.

ALBIN WARTH, OF STAPLETON, NEW YORK.

IMPROVEMENT IN MACHINES FOR CUTTING TEXTILE AND OTHER MATERIALS.

Specification forming part of Letters Patent No. 151,456, dated May 26, 1874; application filed April 22, 1874.

To all whom it may concern:

Be it known that I, ALBIN WARTH, of Stapleton, in the county of Richmond and State of New York, have invented a new and useful Improvement in Machines for Cutting Textile and other Materials; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification, in which drawing—

Figure 1 represents a longitudinal vertical section of this invention. Fig. 2 is a side view of the same. Fig. 3 is a horizontal section of the same in the plane *x x*, Fig. 2. Fig. 4 is a sectional front view of the same when the cutting-machine is fastened to the table. Fig. 5 is a rear view of the mechanism for imparting motion to the cutting mechanism, in a smaller scale than the previous figures. Fig. 6 is a plan or top view of this driving mechanism. Fig. 7 is a transverse section of a modification of the same. Fig. 8 is a rear view of the same. Fig. 9 is a partial front view of the same.

Similar letters indicate corresponding parts.

This invention relates to an improvement on that class of cutting-machines which I term "overboard" machines, and which are so constructed that the entire cutting mechanism can be made to follow the lines of the pattern to be cut out, while the material from which said pattern is to be cut remains stationary on the cutting-board. My present improvement consists in the arrangement of a cutter-bar, a presser-bar, and a feed-bar in the interior of a standard which rises from a platform and carries a handle for turning said standard, and another handle for governing the position of the presser-bar and of the feed-wheel, which is attached to said presser-bar in such a manner that the entire cutting and feed mechanism is condensed into the smallest possible space. Said standard is guided in the end of a tubular arm which forms the bearings for the driving-shaft that imparts a reciprocating motion to a slide which engages with a sleeve fitted on the standard inclosing the cutter-bar, the feed-bar, and the presser-bar, and made to catch over a nose projecting from the cutter-bar, so that the standard can be freely turned in either direction without throwing the cutter-bar out of gear with the driving-shaft. The arm which supports the standard inclosing the cutter-bar, the presser-bar, and the feed-bar extends from a head which has its bearings in a carriage that can be made to travel along the cutting-table by means of an endless belt, said tubular swivel-head forming the bearings for a shaft on which are mounted two pulleys, one to receive motion from the driving-belt of the carriage and the other to transmit the motion, by a belt and guide-pulleys, to the driving-shaft of the cutting mechanism in such a manner that, by the action of the carriage and the swivel-head, the cutting mechanism can be made to act on any portion of the material secured to the cutting-board.

In the drawing, the letter A designates a platform, which may be made circular, or of any other desirable form or shape, and which forms the support for a standard, B, which is provided with a foot, C, that is secured in said platform by screws or any other suitable means. This standard is furnished with two guide-grooves, one for the cutter-bar D and the other for the presser-bar E. Both these bars extend beyond the ends of the standard, and to the lower end of the cutter-bar D is secured the knife F, which is guided between sharp-edged flanges *a* of the foot C, and works through a slot or receiver, *b*, in said foot, so that its cutting-edge is steadied and enabled to pass clear through the material to be cut. The presser-bar E is U-shaped in its cross-section, so as to secure great strength and prevent bending, (Fig. 3,) and to its bottom end is secured the feed-wheel G and the protector H. This protector straddles the front edge of the knife, and it also acts as an indicator, to show the line of the cut. The feed-wheel turns on a pin, *c*, which is secured in the presser-bar, and it is depressed upon the material to be cut by a spring, *d*, which acts through a lever, I, on the presser-bar. Said lever has its fulcrum on a pivot, *e*, Fig. 1, which is secured in an arm, J, projecting from the standard B, and to this arm is fastened a handle, K, that serves to turn the standard together with the entire cutting mechanism. In the arm J

is secured a set-screw, *f*, the head of which catches over the edge of the lever I, and prevents the same, together with the presser-bar, from following the action of the spring *d* beyond the desired point. By adjusting this set-screw, the distance of the feed-wheel G from the surface of the platform A, or from the surface of the foot of the standard B, can be regulated. By depressing the end of the lever I the feed-wheel is raised.

In the channel formed by the U-shaped presser-bar E is situated the feed-bar L, Figs. 2 and 3, which is depressed by the action of a spring, *g*. To the lower end of this feed-bar is pivoted a hook-pawl, *h*, which is held in gear by a spring, *i*, with a ratchet-wheel, *j*, secured to the side of the feed-wheel G, and a stop-pawl, *k*, prevents the retrograde movement of the feed-wheel. On the upper end of the feed-bar is secured a head, *l*, which connects by a rod, *m*, with a bell-crank lever, *n o*, that turns on a pivot, *p*, and the arm *o* of which carries a friction-roller *q*, that bears against a cam-plate, M, secured to the cutter-bar D. When the cutter-bar rises, the bell-crank lever *n o* swings out in the direction of the arrow marked near it, in Fig. 2, and the feed-bar is raised, causing the feed-wheel to revolve in the direction of the arrow marked on it, in Fig. 2, and the material to be cut is carried in under the knife, or the machine is carried toward the material. When the cutter-bar descends, the feed-bar falls back and the pawl *h* takes a fresh hold. The cam-plate M is adjustable on the cutter-bar (see Fig. 1) for the purpose of increasing or diminishing the feed motion.

In the foot of the standard B are mounted one or two rollers, *r r*, Fig. 4, which are opposite the feed-wheel, and if two of such rollers are used I place them somewhat apart from each other, so that the feed-wheel presses the work between them, and a correct feed is insured.

The standard B extends up through eyes *s s*, formed in a bracket, N, which is secured to the end of a tubular arm, O, through which extends the driving-shaft P. On the end of this shaft is secured a disk, *t*, which connects by an eccentric wrist-pin, *u*, and rod *v*, with a slide, Q, Figs. 1 and 3, that moves up and down between guides in the bracket N. Said slide is provided with two lips, a^1 a^1, which straddle a flange, b^1, on the upper end of a sleeve, R, which is fitted loosely on the standard B, so that when the slide Q receives a reciprocating motion, the sleeve R is compelled to move with it. From the cutter-bar extends a nose, c^1, which projects through a slot in the sleeve, so that, by the action of the shaft P, slide Q, and sleeve R, a reciprocating motion is imparted to the cutter-bar. At the same time the sleeve is compelled to turn round with the standard B whenever this standard is turned; but if the sleeve turns, its flange b^1 remains in gear with the lips of the slide Q, and the motion of the slide is transmitted to the cutter-bar, whatever may be the position of the standard. The arm O is secured in a head, S, Fig. 5, which rises from a carriage, T, that moves on a guide-rod, U, secured to the cutting-board V. Through the head S extends a vertical shaft, W, on which are mounted two pulleys, d^1 e^1, one of which engages with a belt, f^1, that is stretched over pulleys g^1 h^1, secured on spindles i^1 j^1, the bearings of which are fastened to the cutting-board. The spindle i^1 also carries a pulley, k', which connects by a belt, l', with a pulley, m', mounted on the main shaft X. In the head S are secured two tension-pulleys, n' n', and a spring-catch, o', which is fastened to the carriage T, and, engaging with a notched disk, p', in the head S, serves to adjust said head according to the tension desired. As the belt f^1 acts on the pulley d^1 it imparts to the vertical shaft W a revolving motion, and this motion is transmitted to the driving-shaft P of the cutting mechanism by a belt, q', which passes over guide-pulleys s' mounted on said driving-shaft. (See Fig. 1.)

By this arrangement the cutting mechanism can be moved over any portion of the cutting-board without throwing it out of gear with the belt f^1, and the cutting-edge of the knife can be made to follow the sinuosities or contours of any pattern that may be marked out on the material placed on said cutting-board. If desired the belt f^1 can be so adjusted that it imparts to the carriage T a sliding motion on the rod U, while the vertical shaft W remains stationary, and begins to move only when the carriage is retained stationary against the action of the belt f^1, and in this case the cutting mechanism is carried automatically over the cutting-board.

The carriage T, instead of being guided on a rod, U, as shown in Figs. 5 and 6, may be arranged on the side of the cutting-board, and made to run on guide-rails v' v', (see Figs. 7 and 8,) one of which is fastened to the floor, and the other to the edge of the cutting-board. In this case the head S is fastened to the side of the carriage, and the belt f^1 acts on the pulley d^1 in the same manner as previously described. If desired, a step-by-step motion may be imparted to the carriage by means of a pawl, a^2, (see Figs. 8 and 9,) which acts on a toothed rack, b^2, secured to the side of the cutting-board, said pawl being secured to a lever, c^2, which receives an oscillating motion by an eccentric, d^2, mounted on a shaft, e^2, which extends through the carriage T, and on which is secured a worm-wheel, f^2, that gears in an endless screw, g^2, on the vertical shaft W. Said pawl can be made to act on the rack b^2 in either direction; or, if it is desired to impart to the carriage a continuous motion, or to retain said carriage in a stationary position, it can be thrown out of gear with the rack. On the shaft e^2 is also mounted a pulley, h^2, and another pulley, i^2, is secured to a stud fastened in the carriage. Round these two pulleys extends a stationary belt, j^2, the ends of which are fast to the feet of the cutting-board, and,

as the pulley h^2 receives a slow revolving motion, the carriage is caused to move along on the belt j^2. When this belt is used the pawl a^2 must be thrown out of gear with the rack b^2.

For certain classes of work the platform A may be taken off, and the foot C of the standard B will in this case move under the material to be cut, or the material may be moved over said foot.

If desired, the platform A may be fastened to the cutting-board, and for this purpose I have provided the same with short feet t', (see Fig. 4,) which can be made to engage with sockets u' formed in a plate, Y, that is secured to the cutting-board by a nut or any other suitable means. If the platform is thus secured, the material to be cut is carried to the knife by the action of the feed-wheel, and the direction of the cut must be governed by turning the work according to the contours of the pattern.

If desired, the head S may be firmly secured to the carriage T, so that the cutting-machine is carried along by the carriage in a rectilinear direction over the cutting-board. The arm O which carries the cutting-machine may be rigid or jointed.

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

1. In a machine for cutting textile and other materials, a cutter-bar, a feed-bar, and a U-shaped presser-bar arranged within a standard supported by a foot or platform, and guided in eyes on the end of a supporting-arm, substantially as described.

2. The handle K, in combination with the standard B, containing the cutter-bar, the U-shaped presser-bar, and the feed-bar, all constructed and operating substantially as described.

3. The sleeve R, with its circular flange b^1, in combination with the standard B, the cutter-bar D, having projection c^1 and the reciprocating slide Q fitted within the bracket which supports the standard B, substantially as set forth.

4. The cam-plate M and bell-crank lever n o, in combination with the cutter-bar D and feed-bar L contained in the standard B, substantially as set forth.

5. The combination of a cutting mechanism, substantially such as herein described, with a carriage, which can be moved along the edge of the cutting-board, and from which motion is transmitted to the cutting mechanism, substantially in the manner set forth.

6. The belt f^1 running over pulleys secured to the cutting-board, in combination with a head, S, supporting the tubular arm O, with the cutting mechanism, and containing a vertical shaft, which transmits motion to the driving-shaft of the cutting mechanism, substantially in the manner shown and described.

7. The combination of a plate, Y, with the platform A, which supports the cutting mechanism, and with a cutting-board, V, substantially as set forth.

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