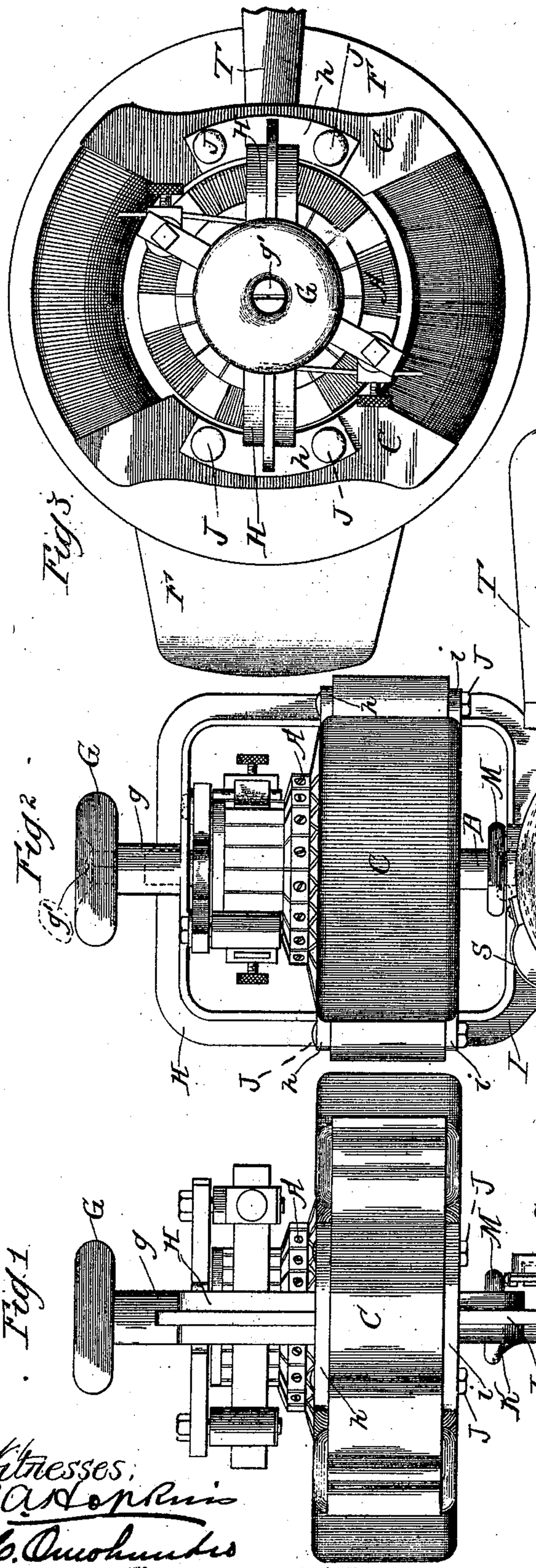
(No Model.) 2 Sheets—Sheet 1.

W. S. SALISBURY.

CLOTH CUTTING MACHINE.

No. 502,052. Patented July 25, 1893.



Witnesses:
F. A. Lopkins
R. C. Quochumbus

Inventor:
By W. S. Salisbury
Elliott & Quochumbus
Attys

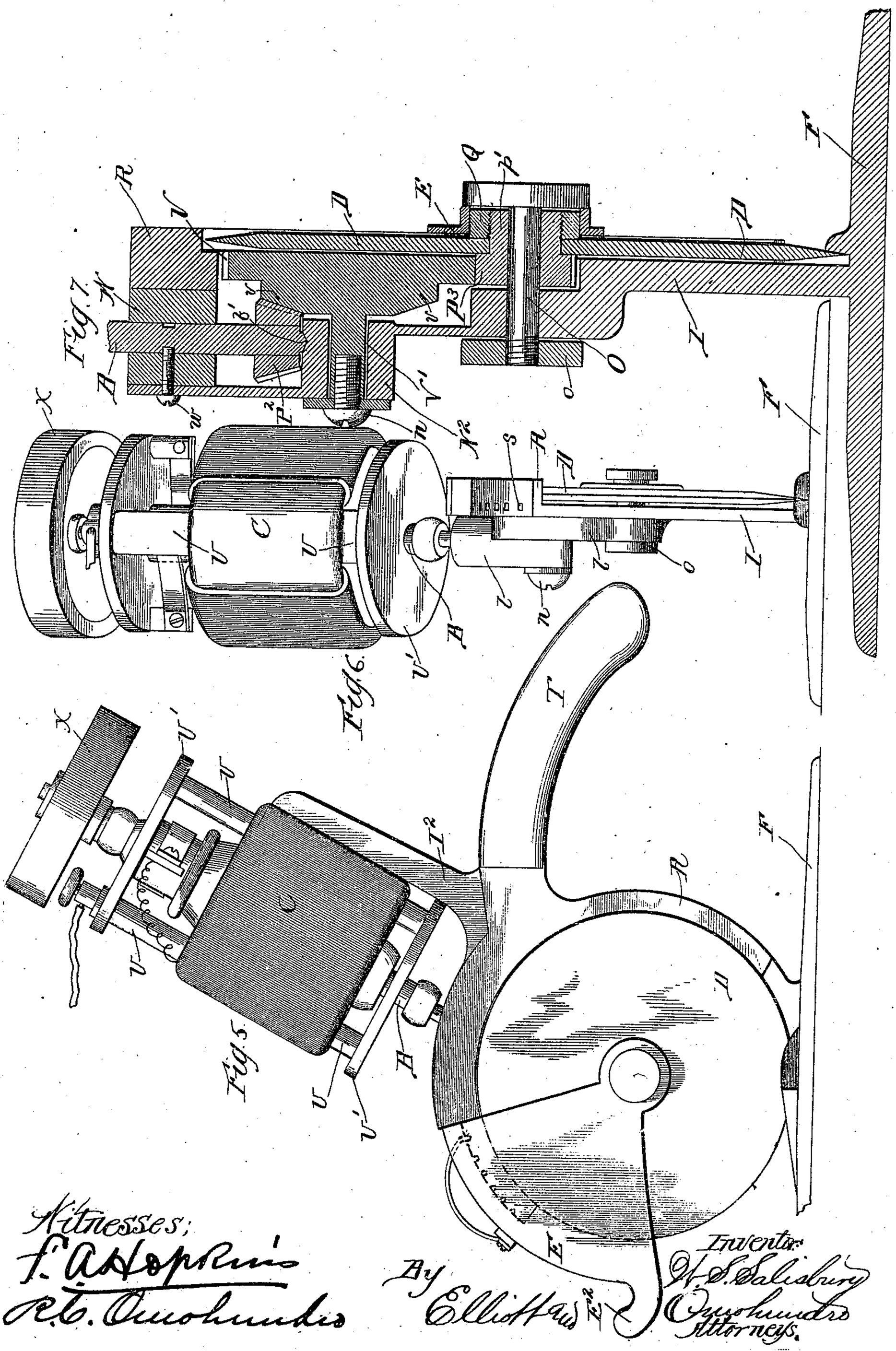
(No Model.)

2 Sheets—Sheet 2.

W. S. SALISBURY.

CLOTH CUTTING MACHINE.

No. 502,052. Patented July 25, 1893.



Witnesses;
F. A. Hopkins
R. C. Onions

Inventor:
W. S. Salisbury
By Elliott & Page
Attorneys.

UNITED STATES PATENT OFFICE.

WILBER S. SALISBURY, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE ELECTRIC CUTTING MACHINE COMPANY OF ILLINOIS.

CLOTH-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 502,052, dated July 25, 1893.

Application filed September 24, 1892. Serial No. 446,813. (No model.)

To all whom it may concern:

Be it known that I, WILBER S. SALISBURY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Cloth-Cutting Machines, of which the following is a clear, full, and exact specification.

My invention relates to machines for cutting cloth and more particularly to that class known as over-board machines, and in which the motive power for actuating the cutting knife is derived from an electric motor mounted upon and carried by the machine which is itself mounted upon a flat foot adapted to slide over the surface of the cutting table under the material being cut.

The primary object of my invention, is to combine with a machine of this character, a rotary as contra-distinguished to a reciprocating cutter.

Another object of my invention is to avoid the jumping or vibratory motion so common with machines of this character heretofore employed, due to the rapid rotation of the armature.

A further object of my invention is to so improve the construction of the machine and the arrangement of its guiding handle as to better adapt it for making sharp or abrupt turns during the cutting operation.

A still further object of my invention is to provide the rotary cutter with an adjustable hand shield or guard.

With these ends in view, my invention consists in certain features of novelty, in the construction, combination and arrangement of parts, by which the said objects and certain other objects hereinafter described are attained as further explained with reference to the accompanying drawings, and more particularly pointed out in the claims.

In the said drawings, Figure 1, is a front view of a cloth cutting machine embodying my improvement, a portion of the foot being broken away. Fig. 2, is a side elevation of the same. Fig. 3, is a plan view, a portion of the handle being broken away. Fig. 4, is a detail sectional view taken on the vertical diameter of the rotary cutter. Fig. 5, is a side elevation of a cloth cutting machine embodying certain modifications of my improvements. Fig. 6, is a front view of the same, the hand shield being omitted, and Fig. 7, is an enlarged detail sectional view taken longitudinally of the armature shaft.

Like signs of reference indicate like parts throughout the several views.

My invention comprises a rotary armature mounted upon a substantial perpendicular shaft, and adapted to rotate in a substantially horizontal plane, whereby the jumping or vibratory motion of the machine when in operation will be avoided; a rotary cutter to which such shaft is connected by gearing so that the rotation of the shaft will be imparted to the cutter for effecting the cutting of the goods; and a supplemental guiding handle secured to the frame of the machine over the rotary cutter in such a position as to be capable of conveniently and quickly effecting the bodily rotation of the machine on an axis extending through the vertical diameter of the cutter, whereby the machine may be accurately guided round abrupt curves or angles without danger of producing a false cut, it being of course understood, that the machine can be more accurately turned on its vertical axis by a handle arranged in a line with such axis than could be effected by an eccentrically disposed handle, as heretofore. My invention also comprises a combined hand-guard or shield and presser foot arranged over the edge of the cutter so as to be capable of adjustment to accommodate itself to piles of goods of various thicknesses, thereby serving at once, as a means for holding the goods down in a compact form in advance of the cutter, and shielding the operator's hand from injury. And my invention also comprises certain other novel features of construction and arrangement all of which will now be described with reference to the drawings in which—

A, indicates the rotary armature; B, the armature shaft; C, the field magnets; D, the rotary cutter; E the adjustable cutter-shield; F the foot upon which the frame carrying these parts is mounted, and G the supplemental guiding handle secured to such frame.

Referring more particularly to Figs. 1 to 4 inclusive, it will be seen that the frame of the machine is preferably constructed of two

parts, an upper part H, and a lower part I. The lower part I, is secured to and supported upon the foot F, and serves as a support for the field magnets C, while such magnets in turn, constitute a support for the upper part H, of the frame, in which the upper end of the armature shaft B, may be suitably journaled as indicated in dotted lines.

The connection between the sections of the frame and the field magnets is preferably effected by means of feet or cross bars *h*, *i*, formed on the parts H, I, respectively, and being secured to the field magnets by means of bolts J, passing therethrough, as more clearly indicated in Figs. 2 and 3.

The upper section H, of the frame is provided with an upwardly projecting stem *g*, which serves as a means for the attachment of the supplemental handle or knob G, and at the same time, provides a bearing for the upper end of the armature shaft.

The knob G, may be formed on, or secured to the stem *g* in any well known way. For instance, such knob may be provided with a socket in which may be fitted a prismatic or squared portion on the end of the stem *g*, the knob or handle being held against vertical movement by means of a screw *g'*, as will be understood.

Inasmuch as the rotation of the armature is very rapid, it is important that the bearings of its shaft should offer as little friction as practicable, and to this end, I provide the lower end of such armature shaft with an anti-friction bearing consisting of a series of small balls K, arranged around the shaft in an annular groove formed in the upper end of the box or housing L, which latter is formed on the lower section I, of the frame. These balls are held in place by means of a washer M, which is likewise provided with an annular groove fitting over the upper sides of the balls and which serves to support the shaft against downward movement, the shaft being provided with a shoulder *b*, which rests upon the upper side of the washer M. By this arrangement, it will be seen that the anti-friction bearing thus constructed serves to sustain the weight of the shaft and the armature, and at the same time, hold the shaft from contact with the sides of the box or housing L. The lower end of the shaft B, however, if desired, may be provided with a point *b'*, stepped in a suitable bearing formed in an enlargement N, of the frame section I. This enlargement N, forms a support for a pin O, upon which the rotary cutter D, is journaled. The cutter, however, is mounted upon a hub *p*, of a beveled gear P, and is securely clamped in place thereon so as to rotate in unison therewith by means of a threaded nut or washer Q, the whole being held in place by the pin O, which passes through such hub and beveled gear, and is provided with a nut *o*, whereby the beveled gear P, will be held in engagement with a beveled gear P', secured to the lower end of the shaft B, thus gearing the armature shaft directly to the rotary cutter. The housing L, if desired, may be extended downwardly so as to also inclose the gear wheel P', and thus exclude the dust and dirt from the interior mechanism.

Formed on the frame portion I, around the back and upper side of the rotary cutter is a flange R, which is preferably flush with the outer surface of the cutter, as more clearly shown in Fig. 4, and which shields the edge of the cutter from injury, and prevents the operator's hand from coming in contact therewith. Pivoted concentrically with the pin O, preferably upon the nut or washer Q, as shown in Fig. 2, is the guard or shield E, which is provided at its upper side with an in-turned flange *e*, over-lapping the flange R, and serving to conceal the forward edge of the cutter. The forward side of this shield *e*, near its lower edge, is provided with an up-turned foot E^2, which serves as a presser foot for holding the goods down in a compact form in advance of the cutter, as before described. This combined shield and presser foot may be rotated on the washer Q, to adjust the height of the presser foot, so as to be capable of operating upon various thicknesses of material, and it may be held in the position to which it is adjusted, by means of a spring dog S, secured to the flange *e*, and adapted to engage in a number of notches or perforations *s* formed in the flange R. The rear side of the lower section I, of the frame, or any other convenient part of the machine, may be provided with the handle T, by means of which the machine is ordinarily manipulated, it being understood, that in the use of my machine, it will be guided around ordinary turns and angles by means of the handle T; but when it is necessary to make an abrupt turn, one hand of the operator will be placed upon the supplemental handle G, and as the axis of such handle is common to the axis of the armature, and is in line with the vertical diameter of the rotary cutter, it will be seen that it may be utilized as a pivot upon which the machine may be turned by means of the handle T, or it may be utilized independently of the handle T, for turning the machine.

In the form which I have now described, the armature shaft is arranged vertically, and the armature revolves in a strictly horizontal plane. With such a construction, it will be seen that the centrifugal force of the armature will be exerted in a plane parallel to the plane of the table, and hence, the jumping or vertical vibration of the machine heretofore experienced will be entirely avoided, it being of course understood, that the spinning armature will resist any movement tending to change the plane of its revolution, and will therefore tend to keep the machine steadily in an upright position, on the principle on which a spinning top maintains its equilibrium. With the armature shaft thus arranged there will be no locomotion of the machine resulting from the centrifugal force,

but it is found, that if the shaft be slightly inclined, as represented in Figs. 5 and 6, the rotation of the armature will cause the machine to travel in the direction in which the lower end of the armature shaft is pointed. In many instances, this result is advantageous because it assists in the movement of the machine over the table, with a steady and constant power, and such inclination of the armature shaft has the further advantage of carrying the armature and its field magnets to the rear of the machine, leaving the forward edge of the knife exposed to the view of the operator from a point farther to the rear of the machine than would be if the shaft were arranged in a strictly vertical position. It should be observed, however, that if the armature shaft is to be inclined, it must, in order to produce the advantageous results above mentioned, be inclined rearwardly and in a plane parallel with the plane of the rotary cutter. When the shaft is thus inclined, the armature of course will not rotate in a strictly horizontal plane, but this slight inclination of the armature will not defeat the advantageous results which I have described, with reference to a horizontally arranged armature, and I consider an armature when only slightly inclined from the horizontal, as I have here shown it, to be substantially horizontal. In this modified form of my invention, the frame of the machine is provided with an upwardly projecting inclined arm I^2, to which the field magnets C, are suitably secured and attached to the upper and lower sides of the field magnets by means of suitable rods U, are two plates U′, in which the armature shaft B, is journaled. In this form of the machine, the armature shaft, may if desired, be connected or geared to the rotary cutter by means of a gearing similar to that shown in Fig. 4, but in order to adapt the device for light and rapid work, I prefer to connect the armature shaft to the rotary cutter by means of a train of gearing, such as shown in Fig. 7, whereby the revolutions of the armature shaft will be multiplied. This preferably consists of a beveled gear or pinion P^2, secured to the lower end of the armature shaft, and engaging with a beveled gear *v*, formed on the side of a gear wheel V, which latter engages with a smaller pinion P^3, journaled on the pin O, and having a hub *p′* upon which the rotary cutter is clamped by means of the nut Q, the gear P^3 being held in place and in engagement with the gear V, by means of a pin O, which, as in the form before described, is provided with a nut *o*, by means of which it is held in place. The gear wheel V, is provided with a journal V′, mounted in an enlargement N^2, formed on the frame of the machine, the end of the journal V′ being engaged by a screw, or other suitable device *n*, for holding it in place.

The shaft B, may be provided with any suitable bearing in the frame, and supported upon the enlargement N^2, as before described. I have shown in this form, a bearing block W, through which the shaft B, passes, and in which the shaft is held by means of a screw *w*, passing through a portion of the frame and block W, and engaging in a peripheral groove formed in the shaft, as clearly shown in Fig. 7. The frame may be provided with enlargement *l*, in which the gears are inclosed and shielded from dust and dirt. In this form of the invention which is intended for light work, the armature is of small diameter, and hence it is desirable to provide its shaft with a fly wheel X, which I prefer to secure to the upper end of the shaft above the frame, and which, when so arranged, may be utilized as a hand wheel, if necessary.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. In a cloth cutting machine, the combination with a frame, of a rotary cutter journaled therein, an electric motor mounted on said frame and having an upright armature shaft, and a gear connection between said shaft and rotary cutter, substantially as set forth.

2. In a cloth cutting machine, the combination with the frame, of a rotary cutter journaled therein, an electric motor carried by said frame and having its armature shaft journaled in an upright position, and geared directly to said rotary cutter, substantially as set forth.

3. In a cloth cutting machine, the combination with a frame and a cutter mounted thereon, of an electric motor mounted in said frame and having its armature shaft arranged in an upright position and connected to said cutter, and a guiding knob or handle having a common axis with said shaft, substantially as set forth.

4. In a cloth cutting machine, the combination with a frame and a rotary cutter mounted therein, of an electric motor mounted in said frame and having its armature shaft arranged in an upright position over the axis of said cutter, and a guiding knob or handle arranged over said shaft, substantially as set forth.

5. In a cloth cutting machine, the combination with the frame having a foot, a rotary cutter mounted therein and means for operating said cutter, of an adjustable combined presser foot and shield arranged over the edge of said cutter and pivoted concentrically therewith, substantially as set forth.

6. In a cloth cutting machine, the combination of the frame having the circular flange R, thereon, a rotary cutter journaled within said flange and being partially surrounded thereby, a shield pivoted concentrically with said cutter and having a flange over-lapping said flange R, a dog for locking said shield in position, and means for operating said cutter, substantially as set forth.

7. In a cloth cutting machine, the combination with a frame having a foot, a rotary cutter mounted therein, and means for operating said cutter, of a pivoted shield arranged to cover the edge of said cutter, and a spring

dog for holding said shield in position, substantially as set forth.

8. In a cloth cutting machine, the combination of a two-part frame, the field magnets to which the parts of said frame are secured, a longitudinally arranged armature having an upright shaft journaled in said frame, and a cutter connected to said shaft, substantially as set forth.

9. In a cloth cutting machine, the combination of the frame consisting of the upper and lower sections H, I, having cross bars thereon, horizontally arranged field magnets to which said cross bars are secured, a longitudinally arranged armature having an upright shaft journaled in said frame and a cutter connected to said shaft, substantially as set forth.

10. In a cloth cutting machine, the combination of the upper and lower sections H, I, provided with the cross bars *h*, *i*, and the upper section with the centrally arranged stem *g*, the field magnets to which said cross bars *h*, *i*, are secured, the knob G secured to said stem *g*, an armature having an upright shaft journaled in said frame, and a cutter connected to said armature shaft, substantially as set forth.

11. In a cloth cutting machine, the combination with a frame and a rotary cutter journaled therein, of an electric motor having an upright armature shaft journaled in said frame, and a pair of beveled gears connecting said shaft to said cutter, substantially as set forth.

12. In a cloth cutting machine, the combination with a frame and a rotary cutter journaled therein, of an electric motor having an upright armature shaft journaled in said frame and being geared to said cutter, the washer M, upon which said shaft is supported, and anti-friction balls interposed between said washer and frame, substantially as set forth.

WILBER S. SALISBURY.

Witnesses:
R. C. OMOHUNDRO,
F. A. HOPKINS.