(No Model.) 2 Sheets—Sheet 1.

D. SCOTT, J. J. MANN & J. H. SMITH.

KNIFE FOR CUTTING PILE FABRICS.

No. 539,147. Patented May 14, 1895.

Fig. 2.

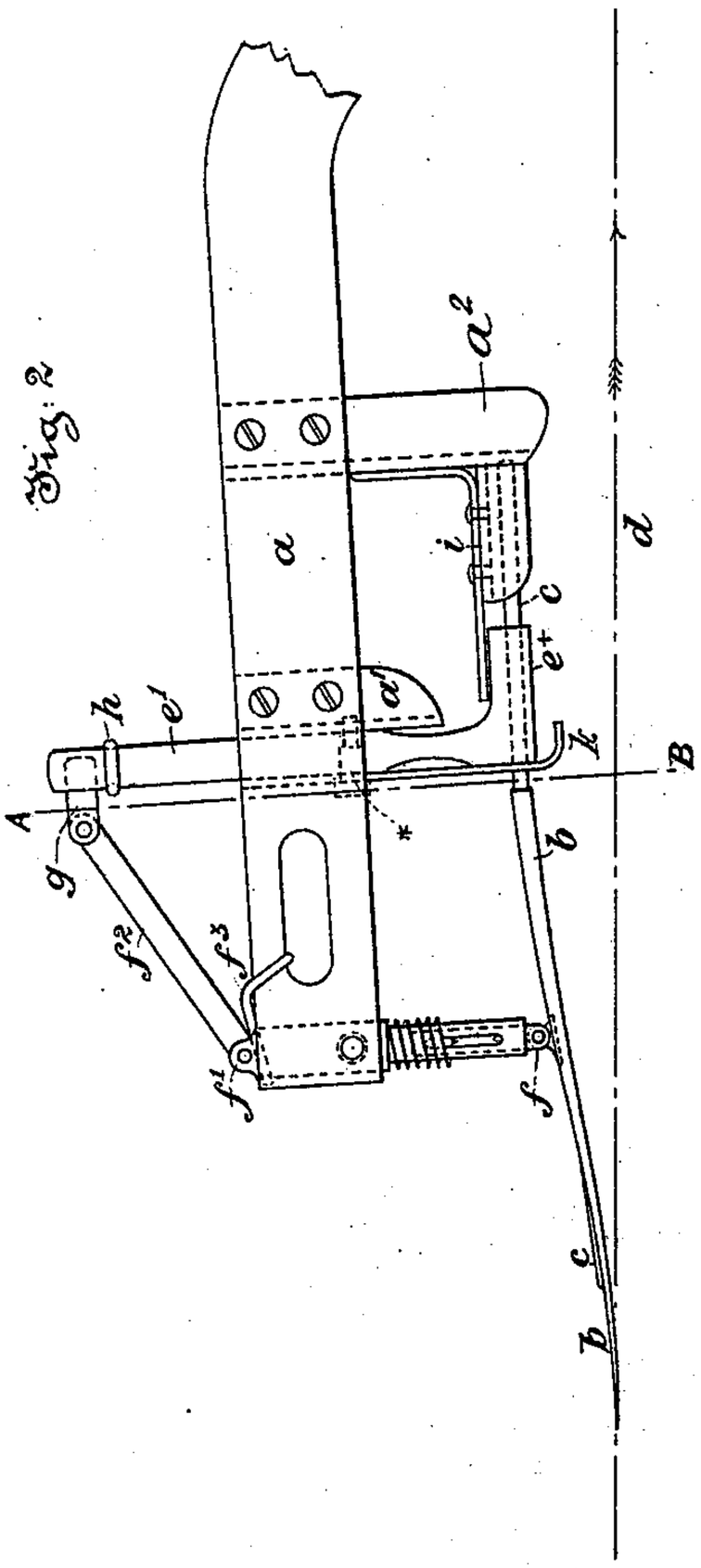

Fig. 4.

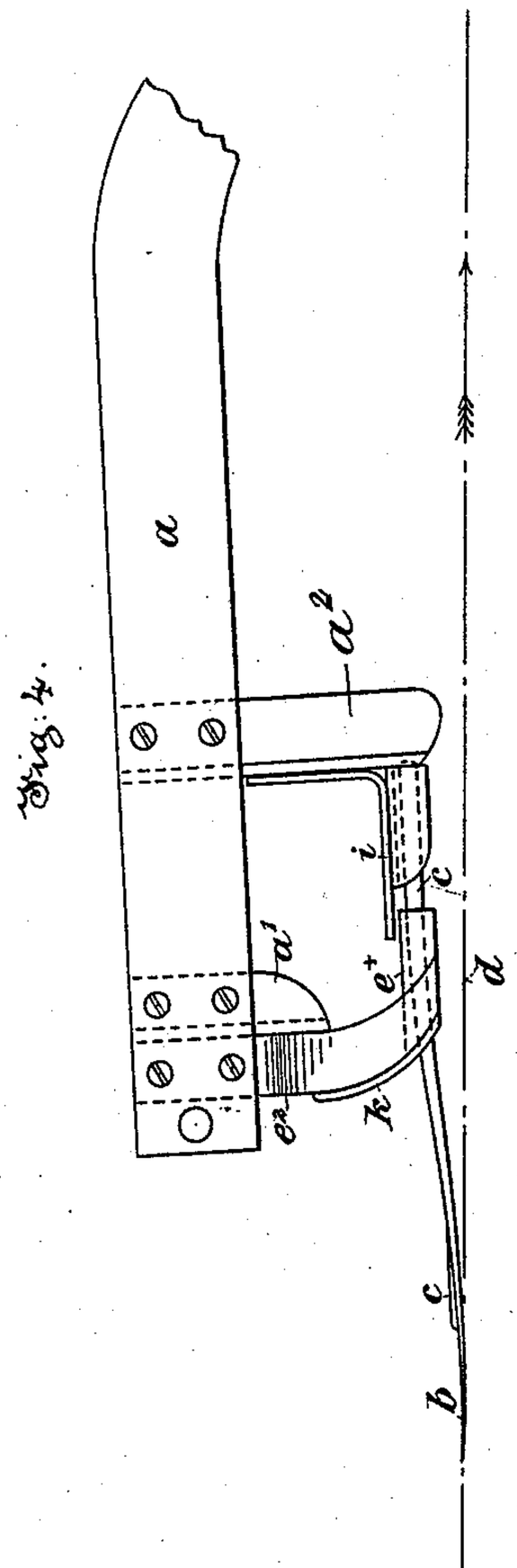

Fig. 1.

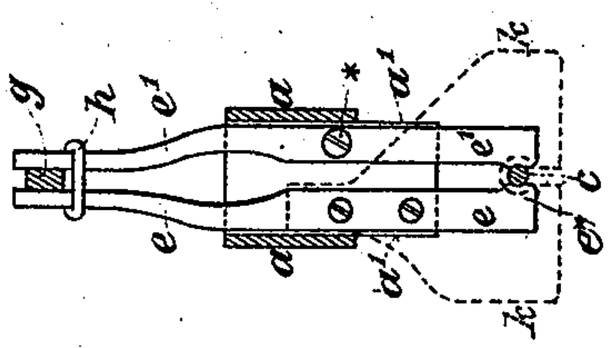

Fig. 3.

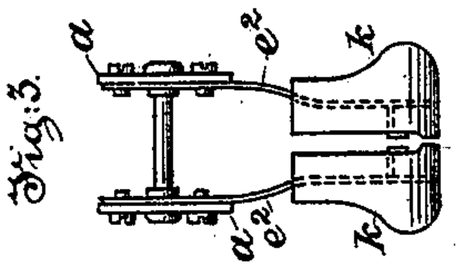

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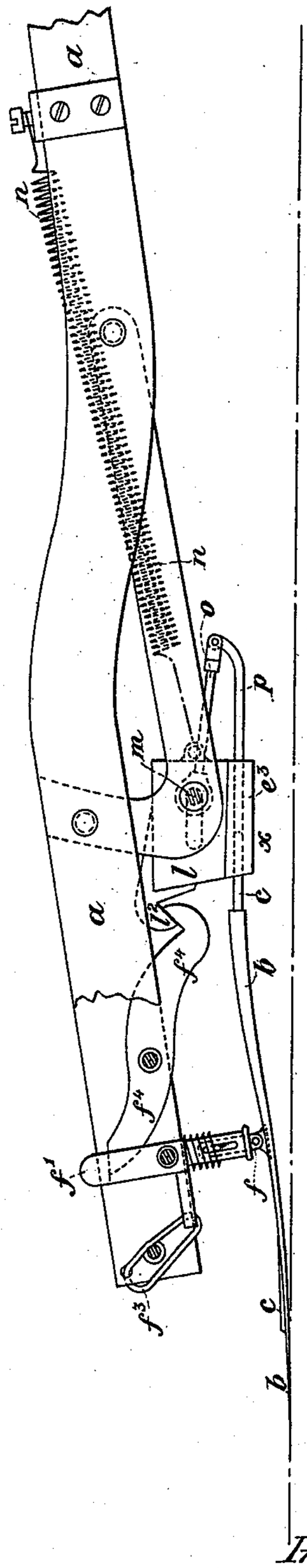
Fig. 5.



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UNITED STATES PATENT OFFICE.

DUGALD SCOTT, OF MANCHESTER, AND JOHN JAMES MANN AND JAMES HOYLE SMITH, OF SALFORD, ASSIGNORS TO THE FUSTIAN CUTTING MACHINE COMPANY, LIMITED, OF SALFORD, ENGLAND.

KNIFE FOR CUTTING PILE FABRICS.

SPECIFICATION forming part of Letters Patent No. 539,147, dated May 14, 1895.

Application filed February 6, 1894. Serial No. 499,293. (No model.) Patented in Switzerland January 30, 1894, No. 7,969.

To all whom it may concern:

Be it known that we, DUGALD SCOTT, residing at Manchester, and JOHN JAMES MANN and JAMES HOYLE SMITH, residing at Salford, in the county of Lancaster, England, subjects of the Queen of Great Britain and Ireland, have invented Improvements in Knives for Cutting Pile Fabrics, (for which Letters Patent No. 7,969, and dated January 30, 1894, have been obtained in Switzerland,) of which the following is a specification.

This invention relates to the knives used for the cutting of weft pile fabrics, and more especially to those used in connection with fustian cutting machines, the object of the invention being to reduce to a minimum the damage occasioned when the point of the knife cuts through the back of the cloth particularly when the cloth in the machine is running at high speed.

Many devices have been invented either to drop the knife upon the cloth or to withdraw it from the hole before a long slit can be formed, but such devices have not been quite successful at high speeds.

According to the present invention we so mount the knife and guide in the handle or holder that they can be retained when the pile is being properly cut, but if the point goes through the back of the cloth the said cloth will automatically release the said knife and guide and separate them from the handle or holder so that they (the knife and guide) will fall or pass clear through to the back side of the cloth and make no larger hole than is necessary to allow them to fall clear through the cloth. This can be accomplished in several ways, as will be seen by Figures 1, 2, 3, 4, and 5, which illustrate, as examples, three methods of connecting the knife and guide to the handle or knife-holder in the desired way.

Figs. 2, 4, and 5 are elevations of these modified forms of our invention, showing the front end of the knife handle or holder with the knife and guide attached for cutting. Fig. 1 is a section through about the line A B on Fig. 2, the plate *k* being shown dotted. Fig. 3 is a view of the end of the apparatus shown on Fig. 4.

In the various figures *a* is the handle or holder and *b* the guide which incloses the knife *c* in the usual way.

The dotted line *d* (on Figs. 2, 4 and 5) represents the cloth which is moved rapidly in the direction shown by the arrow (or the knife is passed rapidly over the cloth in the reverse direction).

It will be seen in all the figures that the knife *c* and guide *b* are quite separate from the handle or holder *a* but are held therein, see Figs. 1 and 2, by levers or arms *e e'* or (see Fig. 5) by a removable socket in the form, for example, of a small cylinder e^3. Any other means for temporarily fixing the knife and guide in the holder may be employed. The knife and guide are made as short as possible and without projecting parts so as to pass clear through the back of the cloth without hinderance and without causing a large hole or slit.

In the case shown at Fig. 1, the knife *c* and guide *b* are held by the jaws $e^\times$ at the lower end of the arms *e e'*, the arm *e* being by preference fixed to the part *a'* of the handle or holder *a* and the arm *e'* being pivoted thereto at the point *. The loose end of the spring trigger *f* rests upon the guide *b* and in the groove thereof, not being in any other way attached thereto, but being self-adjusting as shown in the slotted end of the trigger lever *f'* to the upper end of which is connected by a link f^2 a small distance piece, block or wedge *g* inserted between the upper end of the arms *e* and *e'* which are held together by an india rubber ring *h* or other spring connection. An india rubber or other spring f^3 holds the lever *f'* in the position shown on the drawings and retains the piece *g* between the arms *e* and *e'*. The rear end of the knife abuts against the fixed piece a^2 and is protected by a hood *i* from displacement (by the pressure of the spring trigger *f* or otherwise).

It will be seen that should the point of the guide *b* pierce through the back of the cloth *d* which as before explained, is passing rapidly beneath it in the direction indicated by the arrow the cloth will move along the guide *b* and knife *c* until it meets the spring trigger *f*, which it will carry with it, causing the end of the lever *f'* to withdraw the distance piece

or wedge from between the arms *e* and *e'*, and the spring *h* will draw the upper ends of the arms *e* and *e'* together and separate the jaws $e^{\times}$ so that the knife *c* and its guide *b* become detached and fall from holder or handle *a*, and owing to their inertia and the rapid motion of the cloth they will fall and drop clear through to the back side of the cloth and only a small puncture (sufficient to allow of this dropping through of the said knife and guide) will be made in the cloth.

It will be seen from Figs. 3 and 4 that the trigger *f* and its adjuncts may be dispensed with and the cloth will automatically detach the knife *c* and guide *b* from the jaws $e^{\times}$, which in this case may be mounted on springs e^2 which will yield to the action of the cloth, when the guide and knife pierce the latter, and allow the said guide and knife to be detached from the holder *a*.

On Figs. 1, 2, 3 and 4, *k* are guard plates fixed to the arm *e* or to one or both of the springs e^2 to protect the cloth against injury by the jaws $e^{\times}$.

Fig. 5 shows a somewhat different method of attachment. In this case we employ a trigger *f*, lever *f'* and spring f^3 similar to those seen on Fig. 2, but the lever *f'* retains in position a catch lever f^4 which holds forward a sliding piece or plate *l* the lower edge of which is formed or provided with a socket or cylinder e^3. The piece *l* is provided with a slot through which passes a fixed pivot or rod *m*, and the said piece *l* is also connected to the spring *n*, which has not only a tendency to withdraw *l* and e^3 but, when the catch l^2 thereof is engaged with the catch lever f^4 the spring *n* has a tendency to hold it firmly locked thereby. Upon the fixed rod *m* is mounted loosely a lever or swing frame *o*, supporting a hinged rod or piston *p*, the free end of which works in the socket or cylinder e^3, and when the sliding piece *l* and the socket or cylinder e^3 are drawn and locked forward in the position shown, the end of the piston *p* is at or about the point *x* in the cylinder e^3, thereby forming a socket in which the rear end of the knife *c* can be placed, and the said knife *c* and its guide *b* will be held in place as shown at Fig. 5, while the cutting is being properly performed, but should the point pierce through the cloth *d* the latter will push in the trigger *f* and thus disengage the catch lever f^4 from the upper end of the trigger lever *f'*, and the catch l^2 and the piece *l* will be released. The spring *n* will instantly withdraw the piece *l* sliding it back upon the rod *m* and carrying the cylinder e^3 with it and the cylinder e^3 will slide upon the piston *p* until the end of the latter has pushed the rear end of the knife from the socket formed by itself and the cylinder e^3, and the knife and guide are thus free to pass clear through the hole in the back of the cloth without enlarging the said hole or causing a slit to be made.

We would repeat in conclusion that other means may be adopted for detaching the knife and guide from the handle or holder without departing from the principle of our invention, the mechanism above described and shown on the drawings being merely examples to illustrate how the said invention may be carried into practical effect.

We claim as our invention—

1. The combination of a guide and knife for cutting pile fabrics and a handle or holder in which said knife and guide are detachably held, with means for detaching said knife and guide from the said holder or handle whenever the point pierces through the back of the fabric, the knife and guide being free from projecting parts so as to then pass clear through the fabric without hinderance and without causing a large hole or slit, all substantially as described.

2. The combination of a guide and knife for cutting pile fabrics and a handle or holder having a retaining device therefor, with means controlled by the cloth for automatically releasing said retaining device and separating the knife and guide from the said handle or holder whenever the point pierces through the back of the fabric, the said knife and guide being free from projecting parts so as to then pass clear through the fabric without hinderance and without causing a large hole or slit, substantially as described.

3. The combination of a guide and knife for cutting pile fabrics, a handle or holder therefor, and a retaining device connecting them together, with a trigger for releasing the retaining device for the separation of the knife and guide from the handle or holder, the said knife and guide being free from projecting parts so as to then pass clear through the fabric without hinderance and without causing a large hole or slit, all substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

DUGALD SCOTT.
JOHN JAMES MANN.
JAMES HOYLE SMITH.

Witnesses:
W. H. VAUDREY,
JNO. HUGHES.