

(No Model.)

R. HANDY.

# MACHINE FOR SPLITTING DOUBLE PILE FABRICS.

No. 368,829.

Patented Aug. 23, 1887.

Fig. 1.

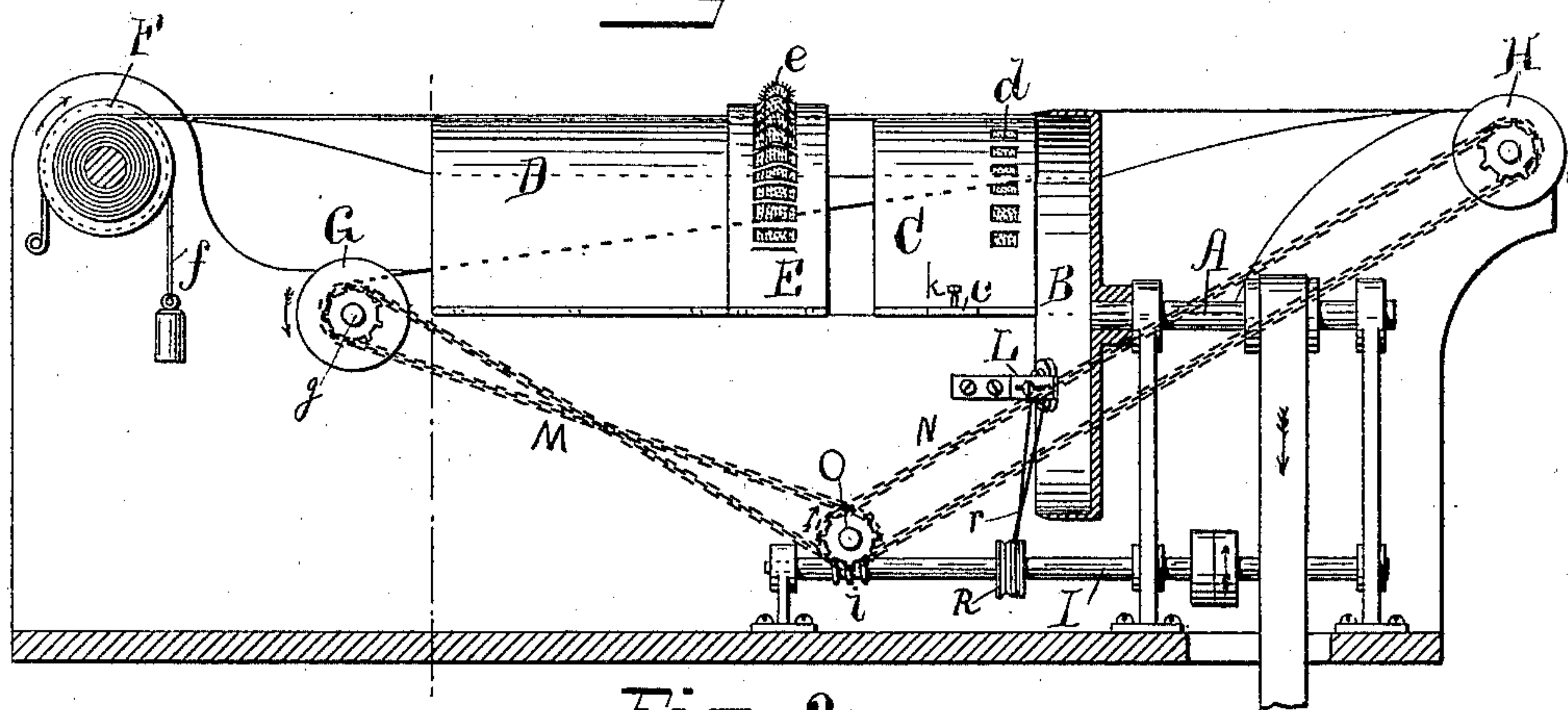
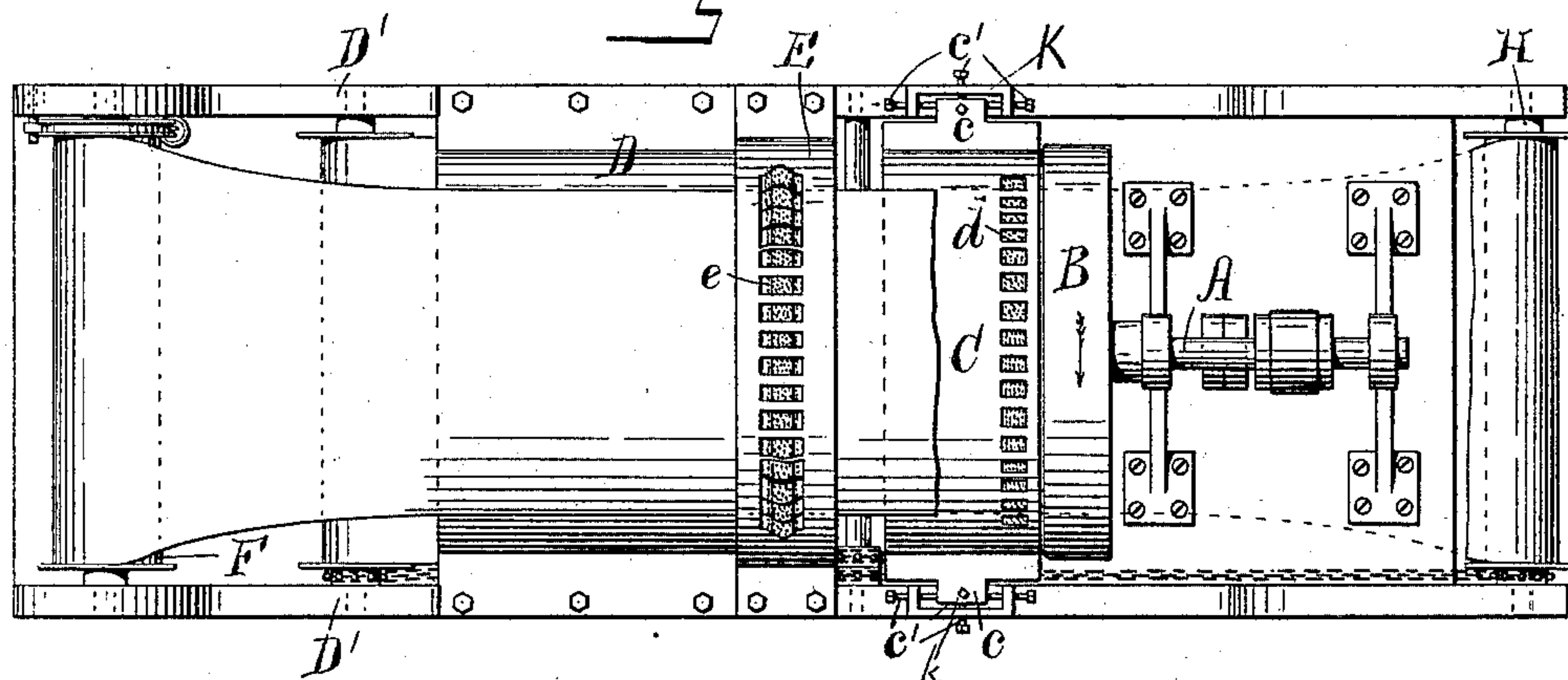
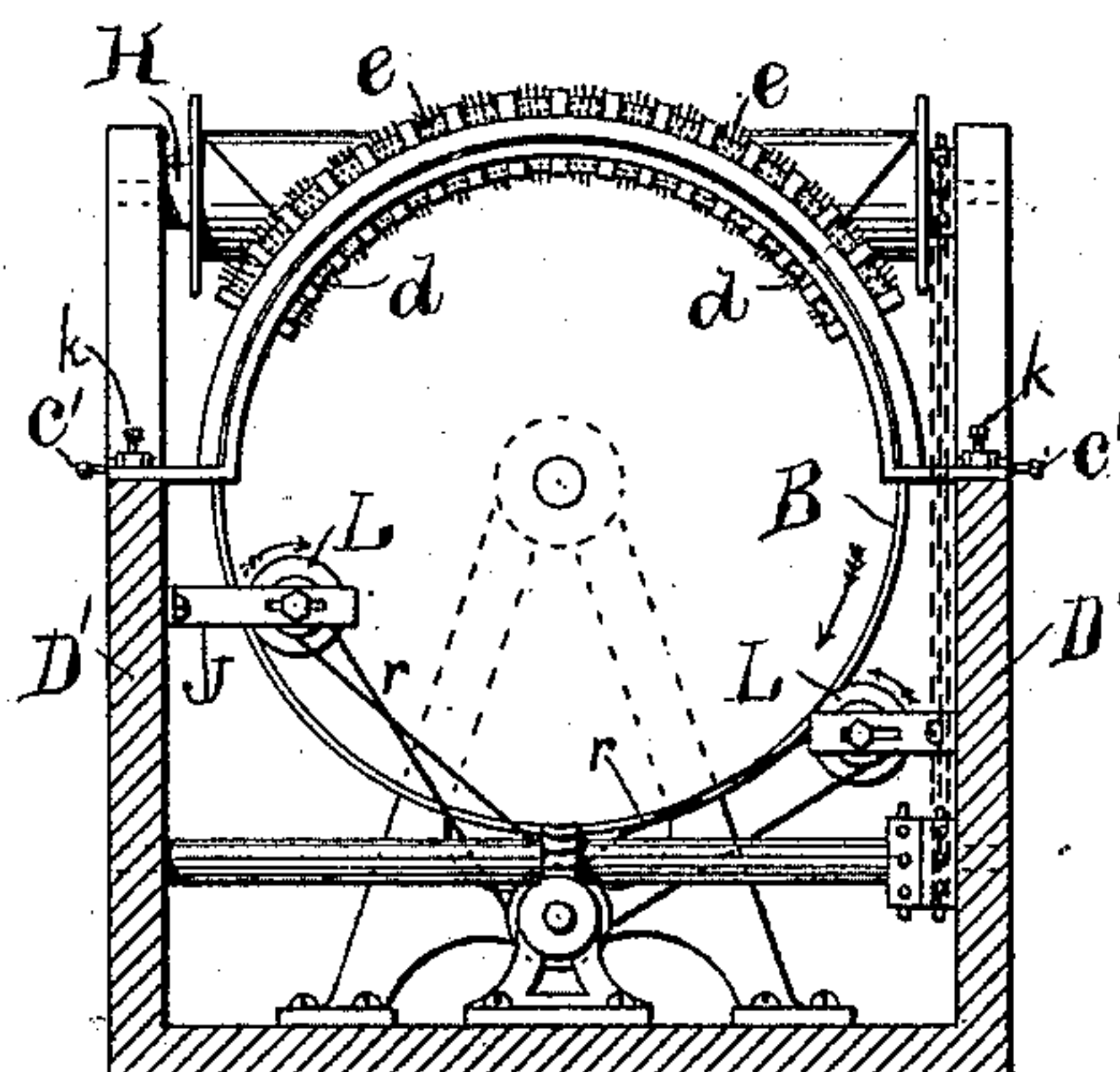


Fig. 2 -



*Fif. 3.*



WITNESSES:

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# UNITED STATES PATENT OFFICE.

RUSSELL HANDY, OF MANVILLE, RHODE ISLAND.

## MACHINE FOR SPLITTING DOUBLE PILE FABRICS.

SPECIFICATION forming part of Letters Patent No. 368,829, dated August 23, 1887.

Application filed September 15, 1885. Serial No. 177,131. (No model.)

*To all whom it may concern:*

Be it known that I, RUSSELL HANDY, of Manville, in the county of Providence and State of Rhode Island, have invented a new and useful Improvement in Machines for Splitting Double Piled Fabrics; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification.

This invention has reference to an improvement in machines for cutting or separating such fabrics as have been woven with two surfaces, consisting of warp and filling, into which loops are interwoven, which, when cut into two sheets, give a velvet surface on one side of the fabric—such as is the case in velvet, velveteen, and velvet carpets.

The invention consists in the peculiar and novel construction of the machine, by which the fabric is firmly held while a rotating knife or cutter separates the pile, as will be more fully set forth hereinafter.

Figure 1 is a side elevation of the machine, the framing, the cylindrical knife, and the fabric being shown as in a longitudinal central section and the interior of the machine being exposed to view. Fig. 2 is a top view of the machine, and Fig. 3 is a cross-section of the machine.

Similar letters of reference indicate corresponding parts in all the figures.

When in the manufacture of velvet, velveteen, or velvet carpets two backs or bodies are woven with the pile of the fabric extending from one back or body to the other, and the two are separated so as to form two sheets, each with a piled or velvet surface, the cutting of the pile becomes a delicate operation, first, because the two fabrics must be cut exactly in the middle of the length of the pile, and, second, the threads forming the pile must be cut without any tearing strain on the pile. The cleaner and smoother the cut the evenner and more uniform will be the surface of the fabric; and as most of these fabrics are colored and finished with a high luster, the slightest strain or tearing of the fiber in cutting will produce defects that can be readily

seen by the purchaser. In my improved machine the fabric is cut by a revolving knife, the surface speed of which is very high, so that the fibers are cut evenly and without the slightest strain.

In the drawings, A is the driving-shaft, on which is mounted the knife or cutter B, which consists of a circular disk provided with a hub, by which it is secured to the driving-shaft, and a cylindrical steel knife secured on the periphery of the disk so as to project beyond the disk, as is shown in Fig. 1. This cylindrical knife is driven at a high speed, having a velocity of about five thousand feet per minute.

C is a metal arched feed-table, the flanged or bent ends *c* of which rest in bolsters or bearings K set on the machine-frame in a fixed position. Each bolster or bearing K is a four-sided rectangular-shaped body, and, as clearly shown, the same consists of a base with three upright sides, which have screw-threaded perforations therein to receive the adjusting-screws *c'* set therein. Each flange *c* of the arched table C is provided with a screw-threaded eye, having an adjusting-screw, *k*, working therein in an obvious manner. The flanges *c* are set loosely in the bolsters K, with the screws *k* resting on the base thereof, whereby the table may be adjusted vertically in an evident way by working the screws. The flanges *c* are engaged on three edges by the ends of the adjusting-screws *c'*, and may accordingly be moved laterally or longitudinally for adjustment relative to the knife B by means of screws *c'*. By virtue of this construction the arch can be accurately adjusted to the knife and the space between the top of the arch C and the knife adjusted to the thickness of the cloth; or, in other words, the knife being a fixture, the arch C can be adjusted so that the knife will cut the fabric into two sheets of equal thickness. As the knife revolves in one direction at great speed, the cloth must be held firmly to prevent its slipping on the arch C. For this purpose the arch C is provided near its forward edge with a series of small idle spur-wheels or rolls, *d d*, provided with spurs or points which enter the



fabric and restrain it against the lateral displacement which would be caused by the action of the rotating knife without these rolls or some equivalent devices.

5 Corresponding in form with the metal arched feed-table C is the arched bed D, which may be made of any suitable material. It forms the guide or support of the fabric, which is drawn over the same toward the knife.

10 E is an arched guide placed over the bed D, so that the fabric can pass between the bed D and the guide E, and this guide E is provided with the rolls *e e*, which are similar to the rolls *d d*, and also provided with spurs or

15 points, which enter the fabric from above and hold the same against lateral displacement. I prefer to make the rolls *e e* larger than the rolls *d d*, and provide the same with longer points, so as to hold the fabric firmly.

20 F is the cloth-beam from which the fabric is delivered to the cutter or knife to be separated. The cloth-beam is restrained from revolving by the usual friction device, *f*, so that the proper amount of tension is secured on the

25 fabric to be operated upon.

When the fabric has been separated into two sheets, the lower sheet is drawn under the arched feed-table C and wound upon the roller G, while the upper sheet is drawn over the

30 knife B and is wound on the roller H. These rollers may be driven in any suitable manner, so that they both draw the fabric but allow the strain to come on the lower half of the sheet only.

35 I do not wish to confine myself to the exact means shown, which consist of the shaft I, the worm-gear *i*, and the drive-chains M and N, and chain-pulleys O, *g*, and *h*, which all operate in an obvious manner, as shown in Fig. 1.

40 The revolving knife B must be maintained in the best possible condition to easily cut the pile of the fabric, and for this purpose the emery-wheels L L are placed in adjustable bearings, so as to continually sharpen the edge

45 of the knife, one bearing against the inside and one against the outside of the knife. The emery-wheels are loosely mounted in the brackets J, fixed upon the machine-framing, and are each driven by fixed pulleys on their axes,

50 over which pass the bands *r r*, respectively, the bands *r r* being in turn passed over a pulley, R, fixed upon the main shaft I. The wheels L are arranged with their axes oblique to the line of motion of the moving knife B.

55 The grinders L L are placed at an angle to the edge of the knife, so that the grinding contact is oblique to the edge. By this arrangement of the grinders the knife-edge, when examined by a magnifying-glass of high power, presents

60 the appearance of a fine saw, the longer angles of which saw-teeth are in the direction of the motion of the knife, so that the knife exerts a drawing cut on the fibers rather than a sawing or hooking cut. This method of grinding the

65 knife facilitates the cutting of the fabric and produces a smoother surface than when the

knife is ground in the opposite direction. In practice I find this arrangement of the grinders to secure a clean even cut without strain on the fiber.

70 The machine is mounted on a suitable frame, D', on which the arched feed-table, guide and bed, the cloth-beam, and the rollers are supported.

Any piled fabric—such as velvet, velveteen, 75 or piled carpets—when woven, as hereinbefore described, can be readily split by this machine with great rapidity, so as to present an even smooth velvety surface.

Having thus described my invention, I claim 80 as new and desire to secure by Letters Patent—

1. The combination, as hereinbefore set forth, with a cylindrical knife and actuating means therefor, of an arched feed-table provided with means for adjusting the table relatively to the 85 knife, whereby the length of the cut pile may be regulated, a series of idle stretching-wheels or the like disposed upon said feed-table, and cloth-rollers and driving mechanism therefor, substantially as described. 90

2. The combination of an endless knife and actuating means therefor, a feed-table having means for adjustment, substantially as described, and provided with a support, a set of idle spur-wheels or the like disposed upon said 95 table, a guide provided with spur or feed wheels disposed thereon, a bed co-operating with the guide, said guide placed in a plane parallel to the plane of the table, whereby the cloth may pass between them, and cloth-rollers 100 and driving mechanism therefor, substantially as described.

3. The combination of a cylindrical knife and actuating means therefor, an arched feed-table provided with spur or stretching wheels, 105 and having means, substantially as described, for adjusting the same in three ways, as vertically, laterally, and longitudinally, relative to said knife.

4. The combination of the cylindrical knife 110 and actuating means therefor, an arched feed-table having the means of adjustment therefor, the idle spur-wheels set loosely in said arched table, the arched guide provided with idle spur-wheels mounted loosely thereon and 115 placed above the plane of the table, the arched bed co-operating with said guide, and the cloth-rollers and driving means therefor, all substantially as described.

5. The combination of the machine-frame, 120 the cylindrical knife B and actuating means therefor, the arched feed-table C, having the idle spur wheels or rollers *d* and provided with adjusting-screws *k*, and the bolsters or bearings K, provided with adjusting-screws *c'* 125 and mounted on the machine-frame, substantially as and for the purpose described.

6. The combination, with the cylindrical knife B and arch C, of the rollers *d d*, provided with points which enter the fabric, as 130 described.

7. The combination, with the arch D, the



arch C, provided with the rollers *d d*, and the knife B, of the arch E, constructed to guide the fabric onto the arch D, as described.

5 8. The combination, with the arches C D E, the rollers *d d*, and the rotating knife B, of the rollers *e e*, constructed to hold the fabric, as described.

10 9. The combination, with the cloth-beam F, of the revolving knife B, the arches E D C, provided with means for holding the fabric against the action of the knife B, and the rollers H G, provided with driving mechanism constructed to draw the fabric over the edge of the knife to split the same, as described.

15 10. The combination of the feed-table consisting of the semicircular arched band, the

idle spur-wheels loosely mounted in the body of said table, the ends of said table flanged, the bolster or bearing for each of said flanges to rest in, said bolster consisting of a frame 20 having a bottom and three upright sides, the turn-screws working in the sides of said bolster and adapted to engage with the edges of said flanges, and the supports for said bolsters, substantially as described. 25

In witness whereof I have hereunto set my hand.

RUSSELL HANDY.

Witnesses:

E. R. HANDY,  
T. H. HANDY.