J. Harraday.

Mach for Cutting out Cloth.

No. 10986. Patented May 30. 1854.

Fig. 1.

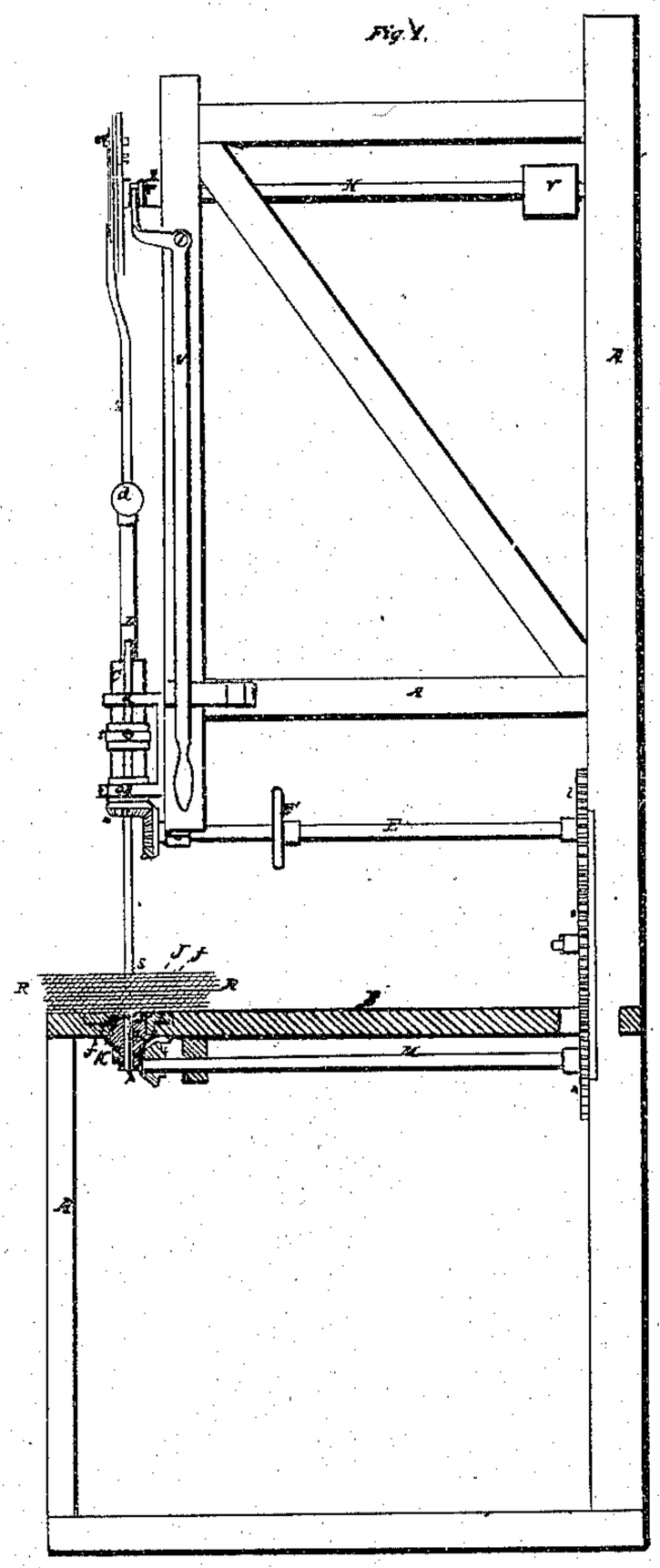


Fig. 6.

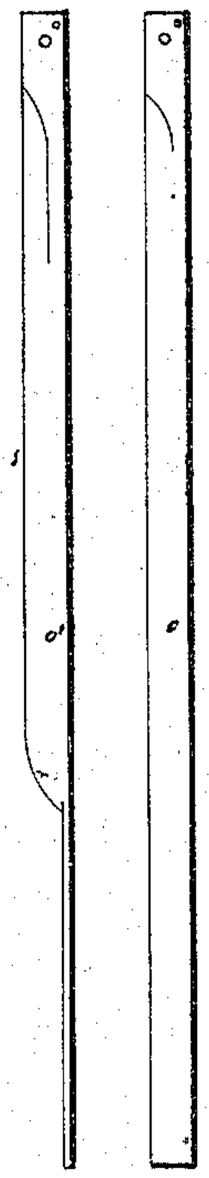


Fig. 7.

Fig. 2.

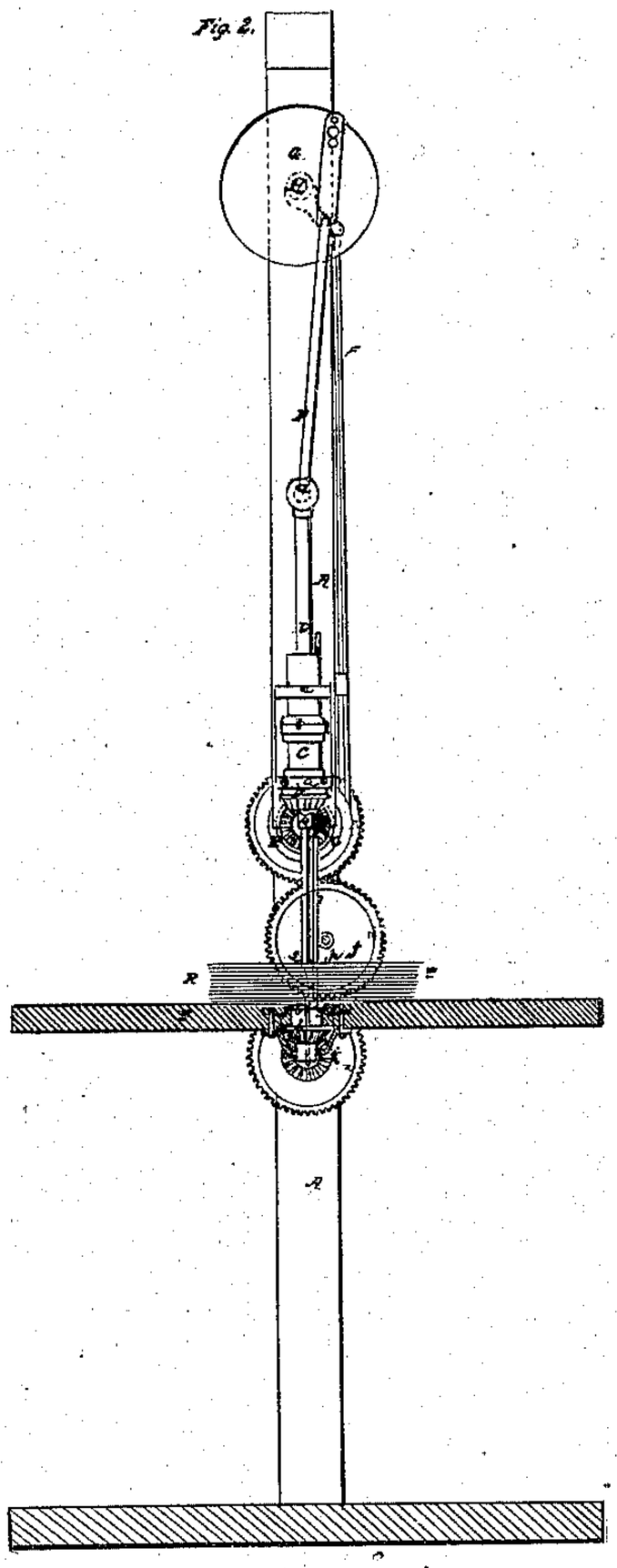


Fig. 3.

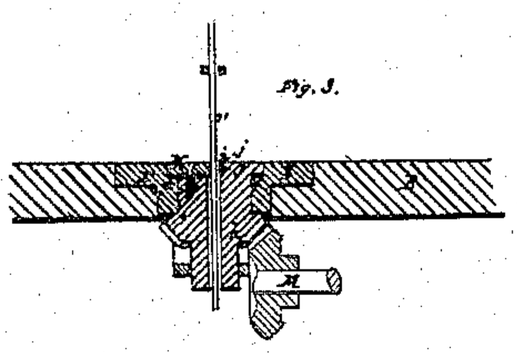


Fig. 4.

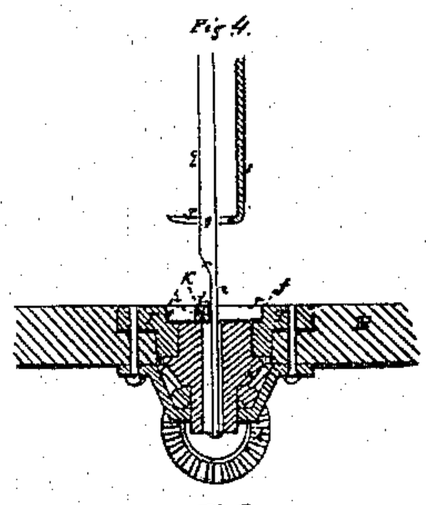
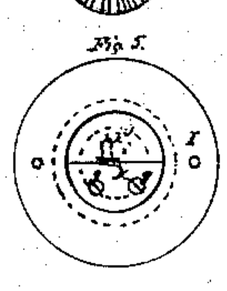


Fig. 5.



UNITED STATES PATENT OFFICE.

JOHN HARRADAY, OF NEW YORK, N. Y.

MACHINE FOR CUTTING OUT CLOTH.

Specification of Letters Patent No. 10,986, dated May 30, 1854.

To all whom it may concern:

Be it known that I, JOHN HARRADAY, of the city, county, and State of New York, have invented a new and useful Machine for Cutting Out Cloth and other Fabrics and Materials Suitable for Garments and Furniture; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1, is a side elevation of the machine with the table supporting a quantity of cloth in section. Fig. 2, is a front elevation of the same, with the table and cloth in section. Fig. 3, is a vertical section of the loose center piece of the table, and the surrounding parts, corresponding with Fig. 1, but on a larger scale. Fig. 4, is a vertical section of the loose center piece, and surrounding portion of the table, with a side view of a portion of the knife, corresponding with Fig. 2, but on the same scale as Fig. 1. Fig. 5, is a plan of the loose center piece and its seat. Figs. 6 and 7, are side views of two knives of different forms. Fig. 8, is a transverse section of the blade of either knife.

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

The main object of my invention is to cut out several pieces or thicknesses of cloth or other fabric or material, at the same time, to a uniform shape and size, so that the corresponding parts of a number of garments or pieces of furniture may be produced by one cutting operation.

In order to effect the above object, I place the several pieces of cloth on a table, and submit them to the action of a reciprocating knife, which works through the said table in a direction perpendicular thereto, but as the knife alone fails to cut perfectly a few of the lower thicknesses, I have been led to devise certain means of remedying this objection, and to this end, the nature of my invention consists in making one side and the edge of the knife work in contact with a sharp edge which is fixed at one side of the opening in the table through which the knife works. The effect of this sharp edge acting in combination with the knife is to cut the bottom piece and one or two pieces above it with a somewhat similar action to a pair of shears, and to prevent them being torn and forced by the knife down into the opening and choking the opening so as to interfere with the free action of the knife.

The nature of my invention consists, secondly, in the employment of a knife of a certain form, which enables it to cut very small and intricate curves, as well as in straight or only slightly curved lines.

The nature of my invention consists, thirdly, in making the bed or table with a loose center piece which contains the opening, into which the cutting knife enters, and the sharp edge with which the knife works in contact, and which is capable of turning on an axis in line with the axis of a shaft which carries the knife, and in gearing the said center piece with the said shaft in such a way, that both may rotate or turn together, to enable the knife to present its edge in any particular direction, and to enable the cutting edge which is applied to the opening in the table, through which the knife passes, to preserve at all times its proper relation to the knife.

To enable those skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A, represents the framing of the machine, supporting the horizontal wooden table, B, and extending upward above it to carry all the working parts.

C, is a vertical shaft, having journals fitted in suitable bearings, *a*, *a*, on the framing above the table which confine it endwise, but allow it to turn freely. This shaft has a square opening directly through it, to receive a smaller square shaft, D, which works freely through it. The outer shaft, C, is furnished, near its lower end, with a bevel toothed wheel, *b*, which gears with another bevel toothed wheel, *c*, on a horizontal shaft, E, which can be turned, when necessary, by a hand wheel, E′, which is secured to it for that purpose. The shaft, D, which carries the cutting knife, is attached by a ball and socket joint, *d*, to a connecting rod, F, which connects it with a stud, *e*, on the face of a disk, G, which is secured to the front end of a horizontal shaft, H, which is the driving shaft of the machine. The stud, *e*, is adjustable at different distances from the axis of the disk, G, and is the equivalent of a crank of variable length, serving to give a reciprocating motion to the knife shaft, D.

The disk is attached to the shaft by a clutch, T, which is thrown in or out of gear by means of a lever, U, as may be desired.

The driving shaft receives motion through a belt which runs from any prime mover to its driving pulley, V.

To that part of the table, under the knife shaft, D, is secured a plate, I, which has a circular opening surrounded by a rabbet, *f*, (see Fig. 4,) to form a seat for the loose center piece which contains the opening through which the knife passes. The loose center piece is of circular form, and its construction will be understood by reference to Figs. 3, and 5. It is made in two parts, J, and K, of which, one part, J, of semicircular form, is cast with the hub of a bevel wheel, *h*, and the other part, K, of similar form, is merely a plate bolted to the hub of the wheel, *h*, by screw bolts, *g*, *g*. The two parts, J, and K, form a flange all around the hub of the wheel, and fit the seat in the plate, I, so as to turn freely therein, and are flush with the table. The axis of the center piece is in line with the axis of the shaft, C. The bevel wheel, *h*, is precisely similar to that *b*, upon the shaft, C, and its hub is hollow, to allow the passage of the cutting knife through it. The reason for making the center piece in two parts is to allow the insertion in the opening through which the knife passes, and for the adjustment or removal, of a piece of steel plate *i*, to form the sharp edge with which the knife works, in or very nearly in close contact. This plate is bolted by screws, *k*, *k*, to the face *j*, of the part, J, of the center piece. Its face is flat, and one side of the knife is made flat to correspond therewith, but the upper or acting edge of the plate is represented as being slightly curved vertically, as projecting slightly above the face of the table and as terminating in an acute angle X. This form of edge I consider to be best; but if the said plate have its edge flush with the table and terminating in a right angle, provided the edge is sharp, it will serve nearly as well the purposes of preventing the lower pieces of cloth being dragged into the opening, and of assisting the knife in cutting them with an action resembling that of shears, or the same purpose may be served by making the opening with a sharp rectangular edge, and fitting the knife close to it, provided the center piece be made of sufficiently durable material to retain a sharp edge. The bevel wheel, *h*, which is attached to the center piece gears with a bevel wheel, *k'*, on a horizontal shaft, M, below the bed. This bevel wheel, *k'*, is precisely similar to the bevel wheel, *c*, on the horizontal shaft E. The shafts, E, and M, are furnished near their back ends with similar spur wheels, *l*, and *m*, which both gear with an intermediate spur wheel, *n*, and thus by turning the shaft, E, a corresponding movement is given to the shaft, M, and motion is transmitted by their bevel wheels, *c*, and *k*, and the bevel wheels, *b*, and *h*, to the shaft, C, and to the center piece, J, K, so that both may turn together, and the same relation may, at all times exist between them.

The knife may consist of a straight edged blade, O, as shown in Fig. 6, or of a blade, O', of the form shown in Fig. 7, either being firmly secured to the shaft, D, by any convenient means. The knife, O', is shown in the machine, as it is applicable to the cutting of all forms, but the knife, O, is only capable of cutting in straight, or very slightly curved lines, as it cannot turn in the cloth, and, if it be turned when it has risen from the cloth, leaves no guide for the movement of the cloth upon the table. Either knife consists of a stiff blade, of uniform thickness from heel to point, entirely flat on the side which is to be placed in contact with the plate *i*, and having a bevel on the other side to make the cutting edge. The back part of the blade, O', is straight, and extended far beyond the extremity of the cutting part of the blade, in the form of a small rod, *p*, which occupies a position in the line of the axis of the shaft, C, and center piece of the table. This rod, *p*, is of such length, that when the cutting part of the blade rises from the cloth to the top of the stroke, the said rod will extend through the whole of the cloth upon the table. The cutting edge, *q*, is parallel for nearly its whole length with the back of the knife, but it is sloped or rounded off at *r*, to meet the rod, *p*. The rod, *p*, is capable of turning freely in the cut in the cloth, and also allows the cloth to be turned, and thus allows the direction of the edge of the knife to be changed, and the cloth to be turned in any direction to be fed toward the edge of the knife, in order to make the cut follow any curved lines, and serves as a guide for the movement of the cloth upon the table, to give any desired direction to the cut. A number of pieces of cloth are represented in section upon the table, and indicated by R, R. They are merely laid upon each other, and are kept firmly together, by a pressing piece, S, which consists of a piece of metal with a slightly rounded face bearing on the cloth, and a slot to allow the knife to work through it. This piece is attached to a rod, *s*, which is capable of sliding in a groove in one side of the shaft, C, and is confined in any position therein to bring the piece, S, to a proper height, by a clamping ring, *t*. The pressing piece, S, is intended to press just so much upon the cloth, as will hold it firmly, but not prevent the cloth being moved freely under it.

The cloth is prepared for the operation of the machine, by marking out the several parts of a garment, or any number of parts thereof, on a suitable length of cloth, in

such a way as to leave the least waste, as is usual in cutting a single piece of cloth by hand, with shears, then cutting off a number of similar lengths of cloth, and laying all the lengths upon each other, in a pile on the table, B, with the marked one at the top, and afterwards bringing them under the pressing piece, S. The cutting knife is then set in motion, and its edge turned in the required direction, by turning the hand wheel, E′. The operator stands in front of the machine, and conducts the pile of cloth by hand toward the edge of the knife, in such a way as to present the lines marked on the top piece to the said edge, and as the knife works up and down, it cuts through the whole pile. The edge of the knife is made to take the required direction in the cloth, either by turning the knife, or by turning the cloth, as the cloth is fed toward it. In some cases it may be more convenient to turn the knife, and in others the cloth. The whole body of cloth is cut by the drawing of the edge of the knife in contact with it, except one or two thicknesses at the bottom, which are cut by the combined action of the edge of the knife, and the edge of the plate, *i*. These two edges act nearly in the same manner as a pair of shears. The plate, *i*, is not at all instrumental in cutting the upper thicknesses of cloth, as the knife will cut the whole number of thicknesses fairly and cleanly, except one or two at the bottom, which are always more or less imperfect when the cutter, *i*, is not used, even though the knife fits close to the edge of the opening in the table; but the cutting edge standing above the side of the hole effectually prevents any injury to the lower thicknesses, and insures a perfectly clean cut throughout. When it is necessary to turn the knife and the center piece of the table, or to turn the cloth, it is done when the cutting part is raised above the cloth and only the rod, *p*, remains therein, as shown in Fig. 4, and the turning can, in almost all cases, be effected without stopping the machine; but when it is necessary, the machine can be readily stopped by the operator, as the lever, V, is in a convenient position, and the stoppage needs to be but of short duration.

The center piece of the table is free to turn without moving the cloth, as it is of small size, and the cloth has a good bearing on the surrounding part of the table. The cut is made to produce the most perfect regularity of form, throughout the whole number of thicknesses, and all the waste from each thickness may be cut off in a single piece, many parts of which would be useful, instead of being cut into shreds or small pieces as when cut by shears.

What I claim as my invention, and desire to secure by Letters Patent, is:—

1. The employment for the purpose of cutting several thicknesses of cloth or other fabric or material, of a reciprocating knife which works through an opening in a table upon which the cloth is placed, and has one side and its edge working in, or very nearly in close contact with a sharp edged plate, *i*, or other sharp edge at one side of the said opening, substantially as herein set forth.

2. The employment of a knife, O′, with the back extended in the form of a rod, *p*, as, and for the purpose herein set forth.

3. Making the table which carries the cloth, fabric, or material, with a loose center piece, J, K, which contains an opening to receive the knife, and has its axis in line with the axis of the knife shaft, and is geared with the knife shaft so as to turn therewith, and at all times bear the proper relation thereto, as herein described.

JOHN HARRADAY.

Witnesses:

O. D. Munn,

S. H. Wales.