2 Sheets--Sheet 1.

C. F. HARLOW.

Cloth-Cutting Machine.

No. 162,547. Patented April 27, 1875.

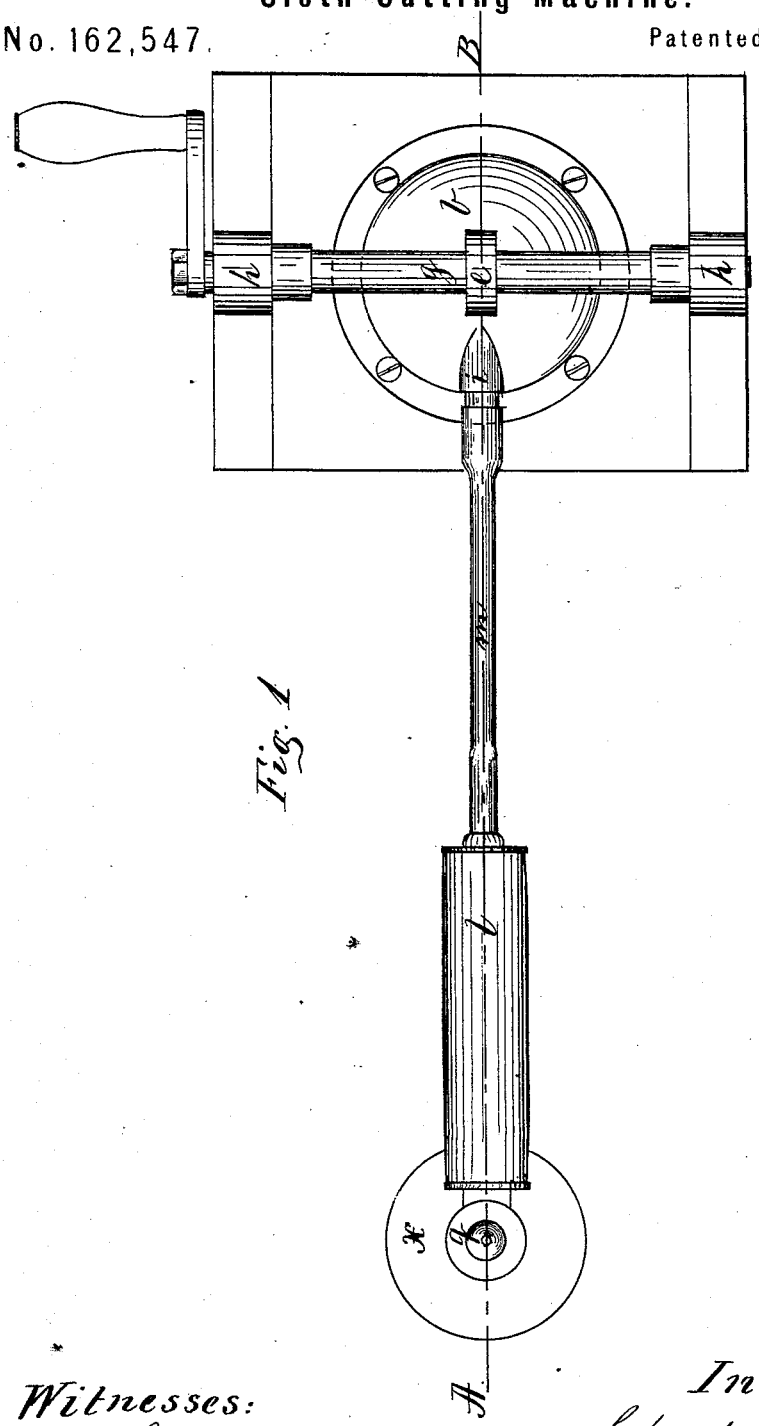

Fig. 1

Witnesses:
John R. Heard.
Francis Allen.

Inventor:
Charles F. Harlow.
by Allan Andrén atty.

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2 Sheets--Sheet 2.

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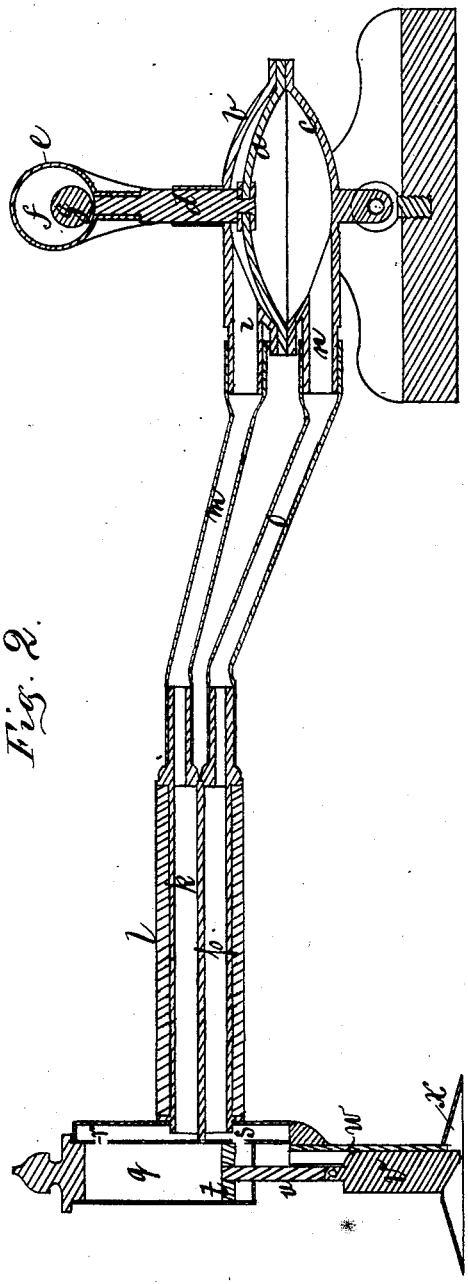

Fig. 2.

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UNITED STATES PATENT OFFICE.

CHARLES F. HARLOW, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN CLOTH-CUTTING MACHINES.

Specification forming part of Letters Patent No. **162,547**, dated April 27, 1875; application filed August 5, 1874.

To all whom it may concern:

Be it known that I, CHARLES F. HARLOW, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Cloth-Cutting Machines and mechanism for their operation; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in cloth-cutting machines and in mechanism for the transmission of a lateral motion, consisting of a flexible diaphragm, the circumference of which is secured between a pair of concave disks, each of which is provided with a pipe or outlet and a flexible hose. The extreme end of each flexible hose or pipe is attached to the end of a hollow handle having two longitudinal perforations leading to the upper and lower ends of a closed cylinder that is attached to the extreme end of the aforesaid handle. In the said cylinder is a piston, movable up and down, which piston is attached to a piston-rod that projects through a hole or stuffing-box in the lower end of the cylinder. A knife is attached to the lower end of the piston-rod, which knife is movable up and down in a guide secured to the handle. The lower end of the guide terminates as a slotted foot-plate, into which the knife descends during its downward stroke. The flexible diaphragm is moved up and down in its hollow case by means of a rod attached to the central part of said diaphragm, which rod passes through a suitable opening or stuffing-box in the hollow case, and is operated by means of an eccentric or its equivalent secured to a shaft that is set in a rotary motion in bearings. As the flexible diaphragm is moved up and down in the hollow case, the air therein is compressed on one side and rarefied on the other side of the diaphragm, and, as the air thus compressed and rarefied is communicated through the aforesaid flexible pipes to the upper and lower end of the cylinder, it causes the piston and its knife to move up and down, and in this manner I am able to cut cloth and other textile or fibrous materials that are placed between the foot-plate and the knife as it descends thereon.

This manner of converting a reciprocating motion from a flexible diaphragm to a movable double-acting piston may be, to great advantage, useful on other kinds of machines besides cloth-cutting machines.

The operation of my invention is as follows: The operator takes hold of the handle and guides the reciprocating knife over the material that is to be cut in such a manner that the foot-plate is placed beneath the material, and the knife is forced through it and the slot in the foot-plate. The revolving shaft that operates the flexible diaphragm is set in a rotary motion by steam or hand power in the usual way, as may be desirable.

On the drawings, Figure 1 represents a ground plan of my invention, and Fig. 2 represents a central longitudinal section on the line A B, shown in Fig. 1.

Similar letters refer to similar parts wherever they occur on the drawings.

a represents a flexible diaphragm, the circumference of which is firmly secured between a pair of concave disks, *b* and *c*, as shown in Fig. 2. To the middle of the diaphragm *a* is attached a rod, *d*, provided in its upper end with a ring, *e*, that surrounds an eccentric disk, *f*, secured to a shaft, *g*, that is made to rotate in bearings *h h* in the usual way. The concave disk *b* is provided with a pipe, *i*, opening into it, which pipe stands in communication with the perforation *k* in the handle *l* by means of a flexible tube, *m*, as shown in Fig. 2. The concave disk *c* is provided with a similar pipe, *n*, and a flexible tube, *o*, by means of which communication is established from the disk *c* to the perforation *p* in the handle *l*. A double-acting cylinder, *q*, is attached in a suitable manner to the handle *l*, and is provided with an upper entrance, *r*, communicating with the perforation *k*, flexible tube *m*, and concave disk *v*, and is also provided with a lower entrance, *s*, communicating with the perforation *p*, flexible tube *o*, and concave disk *c*. In the cylinder *q* is the piston *t*, made to slide up and down. The piston *t* is provided with a piston-rod, *u*, that projects through a hole or stuffing-box in the bottom of the cylinder *q*, as shown

in Fig. 2. The knife or cutter *v* is attached to the lower end of the piston-rod *u*, and is guided in the guide *w*, that is secured to the cylinder *q* and handle *l* in a suitable manner. The guide *w* terminates as a concave slotted foot-plate, *x*, into which the knife *v* descends during the latter part of its downward stroke.

The mechanism, as herein shown, may, to great advantage, be employed for the purpose of communicating a reciprocating motion from a laterally-adjustable flexible diaphragm to a piston, for other kinds of machines besides cloth-cutting machines, such as, for instance, gig saws or similar machines.

Having thus fully described the nature, construction, and operation of my invention, I wish to secure by Letters Patent and claim—

1. A machine for cutting cloth or other textile and fibrous materials, consisting of the laterally-adjustable flexible diaphragm *a*, hollow case *b c*, pipes *i m k* and *n o p*, the handle *l*, cylinder *q* with its piston *t* and rod *g*, the cutter *v* with its guide *w* and slotted foot-plate *x*, as and for the purpose herein set forth and described.

2. The mechanism, as herein shown, for the transmission of a reciprocating motion, consisting of a laterally-adjustable flexible diaphragm, *a*, hollow case *b c*, pipes *i m k* and *n o p*, the cylinder *q* with its channels *r s*, and movable piston *t*, as herein shown and described.

In testimony that I claim the foregoing as my own invention I have affixed my signature in presence of two witnesses.

CHARLES F. HARLOW.

Witnesses:
ALBAN ANDRÉN,
JOHN R. HEARD.