

W. KEENAN.
Felting-Machine.

No. 208,180.

Patented Sept. 17, 1878.

Fig. 2.

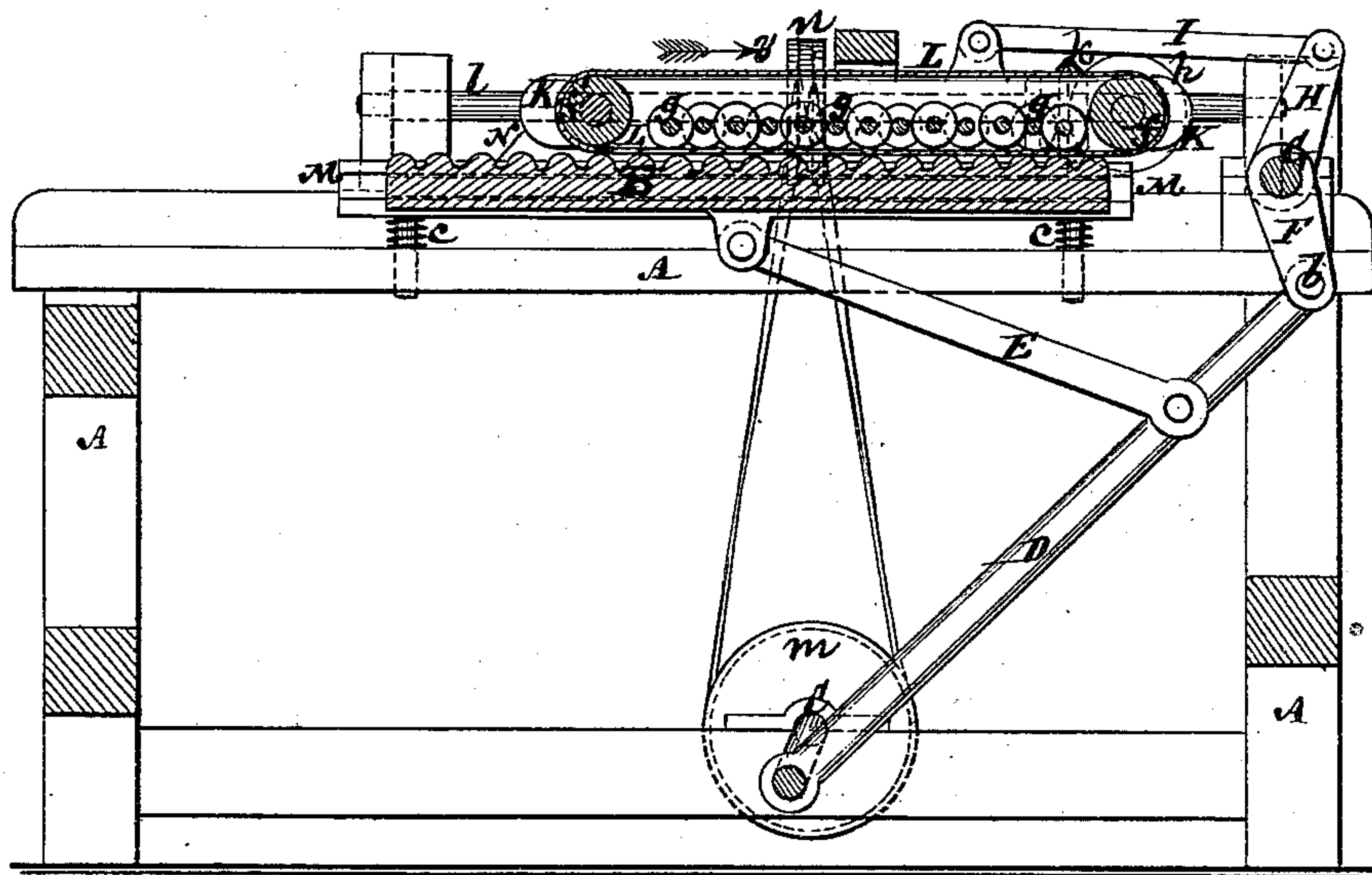
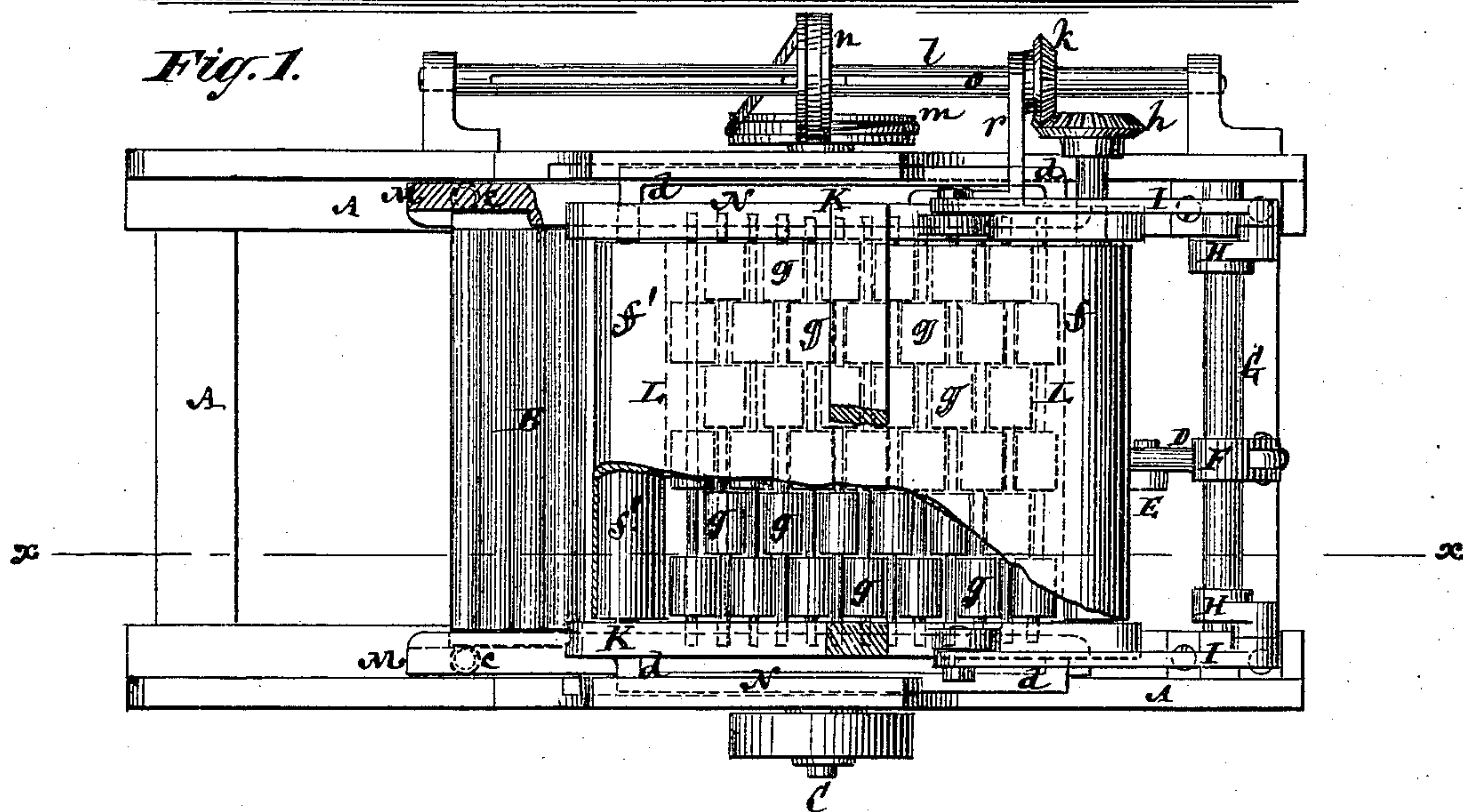


Fig. 1.



Witnesses
John Becker
Fred. Haynes

Inventor
William Keenan
by his Attorney
Brown & Allen.

UNITED STATES PATENT OFFICE.

WILLIAM KEENAN, OF BROOKLYN, NEW YORK, ASSIGNOR OF ONE-HALF
HIS RIGHT TO NICHOLAS B. HOOPER, OF SAME PLACE.

IMPROVEMENT IN FELTING-MACHINES.

Specification forming part of Letters Patent No. **208,180**, dated September 17, 1878; application filed
August 22, 1878.

To all whom it may concern:

Be it known that I, WILLIAM KEENAN, of the city of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Felting-Machines, of which the following is a description, reference being had to the accompanying drawings, forming part of this specification.

This invention more especially relates to machines for felting, sizing, or planking hat-bodies, and will here be described accordingly.

The invention consists in certain novel combinations of devices for felting hat-bodies and other articles, in which a reciprocating felting-rubber, or device having a felting-apron arranged to run continuously in one direction, is used; and, furthermore, consists in certain means for operating said devices and a felting bed or table, whereby a simple, efficient, and expeditious felting-machine is produced.

In the accompanying drawings, Figure 1 represents a partly-broken plan of a felting-machine constructed in accordance with my invention, and Fig. 2 a vertical longitudinal section of the same on the line *x x*.

A represents the frame of the machine. Said frame, which may be of any suitable construction, carries at or near its top a lower felting table or bed, B, which may be stationary, but is here arranged to have a reciprocating motion in direction of its length, and which may be ribbed or of any other suitable construction on its upper or felting surface. Such bed is or may be reciprocated in direction of its length by means of a revolving crank-shaft, C, a lever, D, operated at its lower end by said crank-shaft, and a rod, E, connecting said lever with the bed B. The upper end of the lever D has its fulcrum *b* on an arm, F, of a cross rock-shaft, G, at the front end of the machine, from which shaft reciprocating motion is communicated by means of arms H and rods I on the reverse side of the axis of said shaft to the upper rubber or felting device, K L, which accordingly is made to reciprocate in reverse directions simultaneously with the felting bed or table B. The felting table or bed B may be fitted to slide or reciprocate in longitudinal guiding strips or ways M, supported by springs *c*, to give a limited yielding action to said bed.

The upper rubber or felting device consists, mainly, of a reciprocating frame, K, and an endless apron, L, running in direction of the length of said frame, which latter is fitted to reciprocate or slide by guides *d d* in or along ways N N, and receives its reciprocating motion, as hereinbefore described, by the arms H and rods I. The apron L of said rubber or upper felting device has a continuous motion in direction of the arrow *y* around end rollers *f f*, carried by the frame K. Said apron, which may be made of canvas or any other suitable material, is properly backed or supported on the inside of its lower length to give to it the necessary firmness for felting the hat-bodies as the latter are introduced and passed in between said apron and the bed B. Such support of the apron it is preferred to effect by means of a series of independent rollers, *g*, arranged in rows lengthwise of the frame K, with their axes crosswise of the latter, and intermediately of each other as regards each successive row of rollers, whereby the lower or acting surface of the apron has an irregular roughened and effective felting configuration when acting on the hat-bodies between it and the bed B. The continuous motion of the apron L in direction of the arrow *y*, while it is reciprocated in common with the frame K, assists in producing a constant change of surface of the goods under operation to the action of the felting devices, and ultimately causes the hat-bodies or goods to be automatically worked off in rear of the felting devices, the apron, by its continuous motion in a given direction, exerting a progressive motion on the goods toward the delivery end of the machine.

By combining with the reciprocating frame K and endless moving apron L a felting-bed, B, reciprocating in a reverse direction simultaneously with the frame K, the change in exposure of the surface of the goods under operation is more effectually secured and a better felting effect produced than when said bed is stationary.

The automatic delivery of the goods from between the apron and the bed, by reason of the continuous motion of the apron in a given direction, materially expedites the work, inas-

much as it is only necessary to introduce the hat-bodies at the front end of the machine between the apron and the bed, and never necessary to open the machine to remove them.

If a single passage of the goods through the machine is not sufficient to properly felt them, they may be passed through again, or any number of times, as before.

To provide for giving to the apron L its continuous motion in a given direction, while the frame K which carries it is reciprocating forward and backward, I arrange on the spindle of the front roller, *f*, a bevel-wheel, *h*, which meshes into a bevel-wheel, *k*, upon a shaft, *l*. This shaft may be rotated by means of a band and pulleys, *m n*, from the crank-shaft C, and has a keyway, *o*, in or along it, within which a key or feather on the bevel-wheel *k* fits. Back of said wheel *k* is a support or bracket, *r*, attached to the reciprocating frame K. This support serves to keep the wheel *k* in gear with the wheel *h* while the frame K is being reciprocated, and the keyway *o* and key in the wheel *k* provide for the rotation of the latter and movement of it back and forth with the reciprocating frame K.

I claim—

1. The combination, with a felting bed or table, of a reciprocating felting rubber or device carrying a felting-apron having a continuous motion in one direction, whereby a compound movement is given to said felting-apron, substantially as specified.

2. The combination of a reciprocating felting bed or table with a reversely-reciprocating felting rubber or device carrying a felting-apron having a continuous motion in one direction, whereby a compound movement is given to the apron, substantially as specified.

3. The combination of the crank-shaft C, the lever D, the rock-shaft G, with its reversely-arranged arms F and H, the rods E and I, and the reciprocating felting-bed B, and contiguous reversely-reciprocating rubber or felting device K L, substantially as specified.

4. The combination, with the frame K, of the reciprocating felting rubber or device and its felting-apron L, arranged to run continuously in one and the same direction, of the rollers *f f'*, the continuously-rotating shaft *l*, the bevel-wheel *h* on one of said rollers, and the bevel-wheel *k*, supported by the reciprocating frame K, and in key or feather connection with the shaft *l*, essentially as described.

5. The combination, with the felting bed or table B and the contiguous reciprocating felting rubber or device having a traveling felting-apron, L, of the backing or supporting rollers *g* within said apron, substantially as specified.

WILLIAM KEENAN.

Witnesses:

HENRY T. BROWN,
T. J. KEANE.