

2 Sheets Sheet 1.

*E. Waite,
Felting Machine.*

No. 65455.

Patented June 4 1867.

Fig. 1.

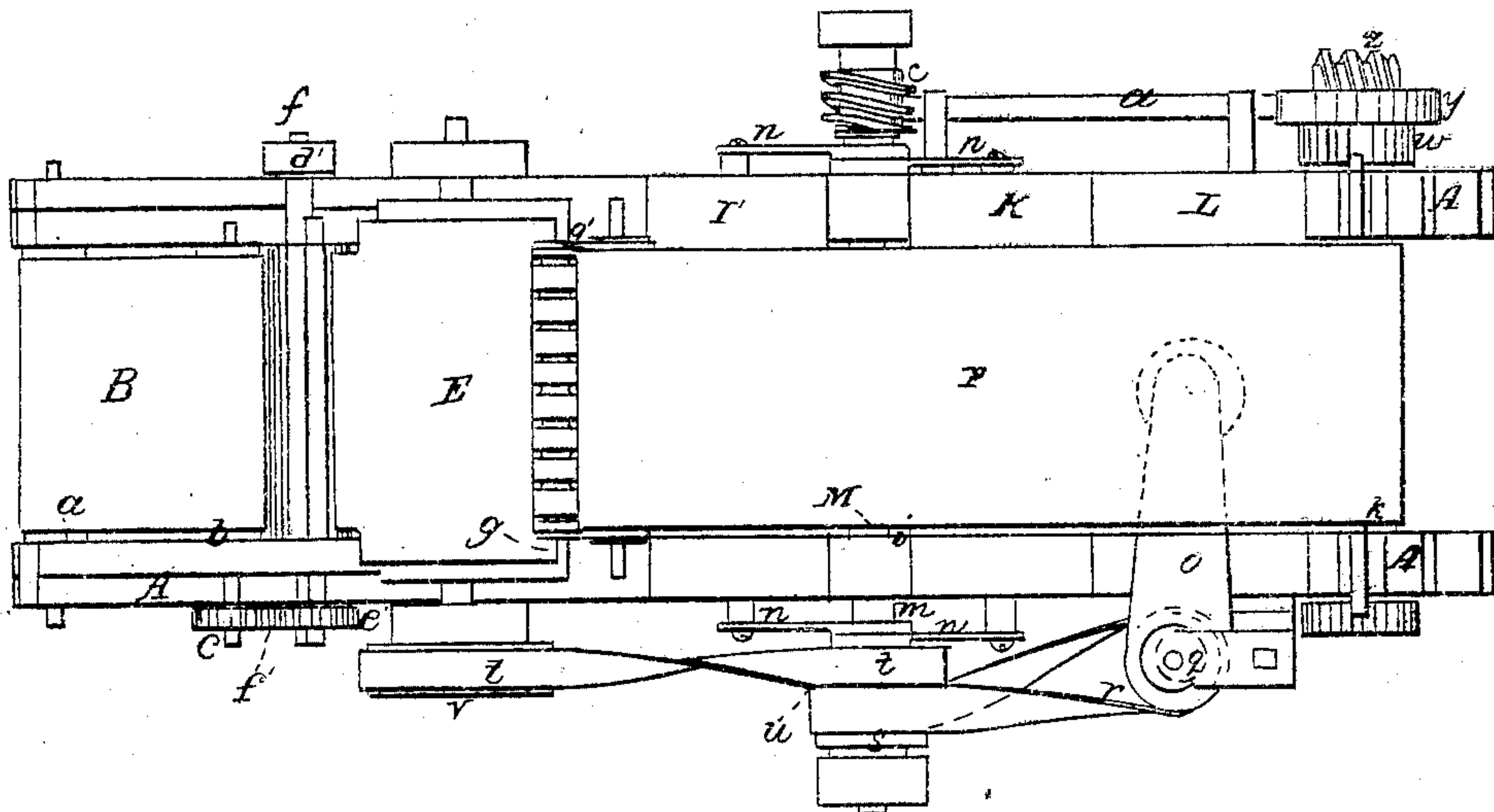
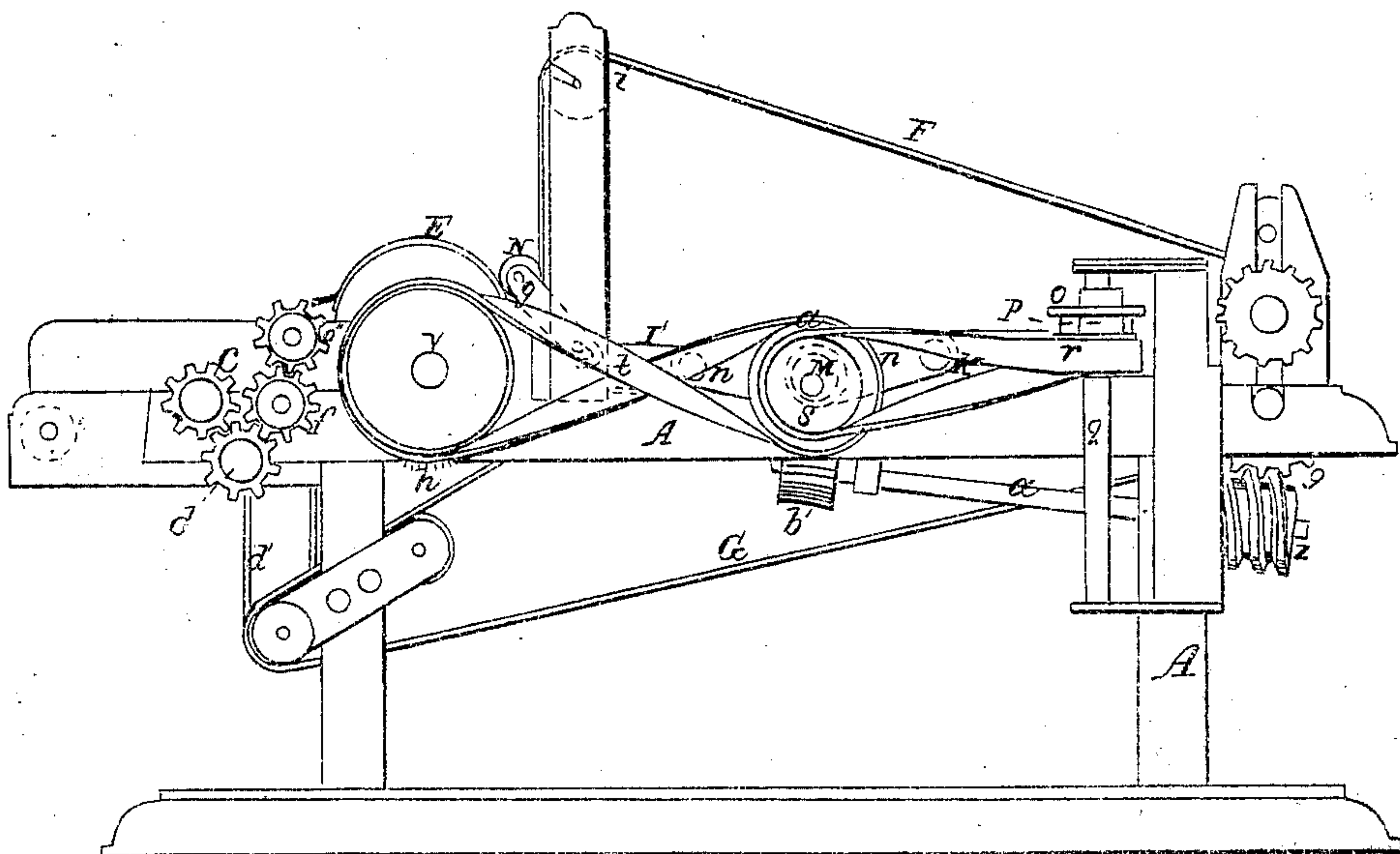


Fig. 2.



Witnesses
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Enoch Waite
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Fig. 4.

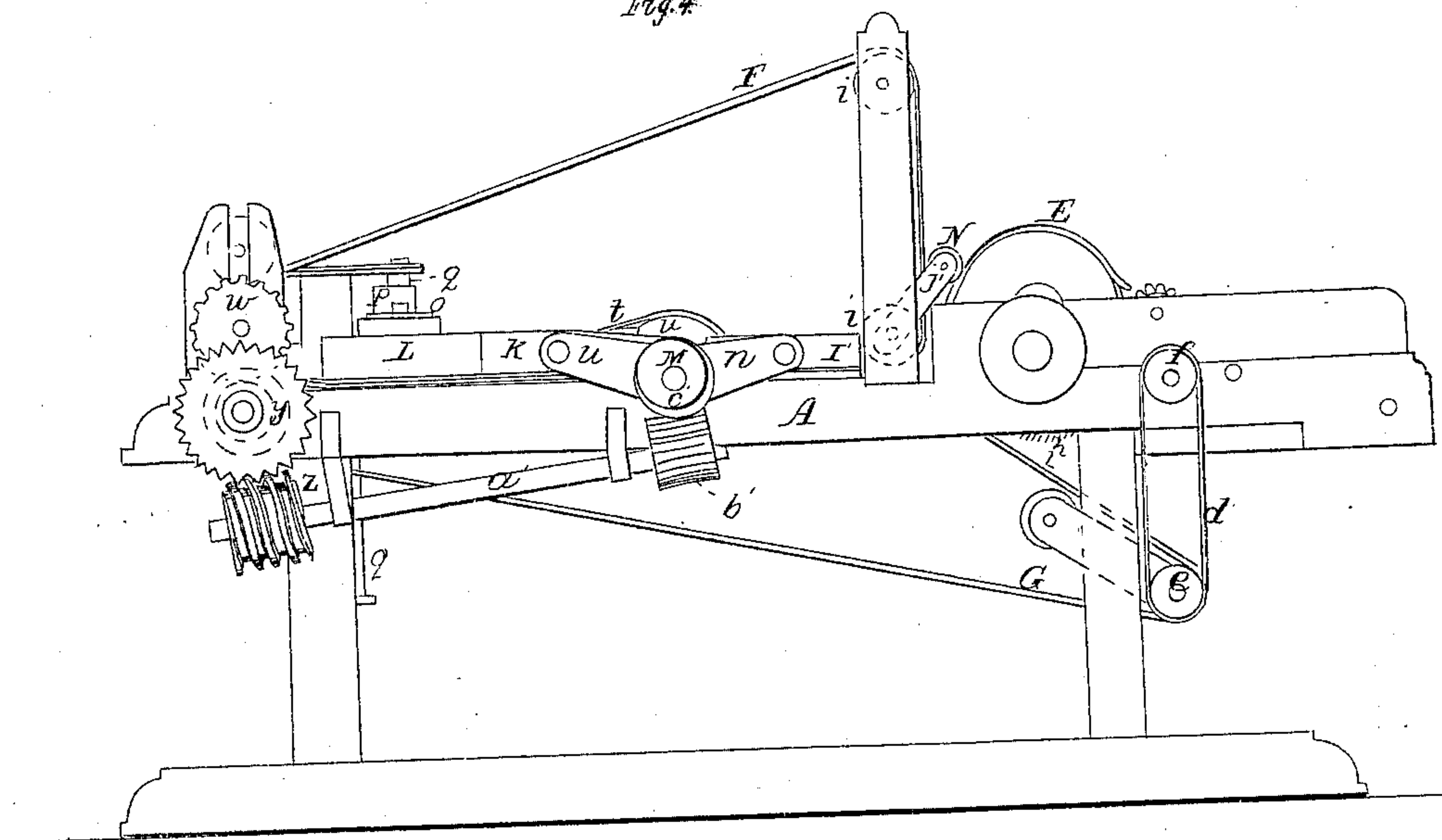
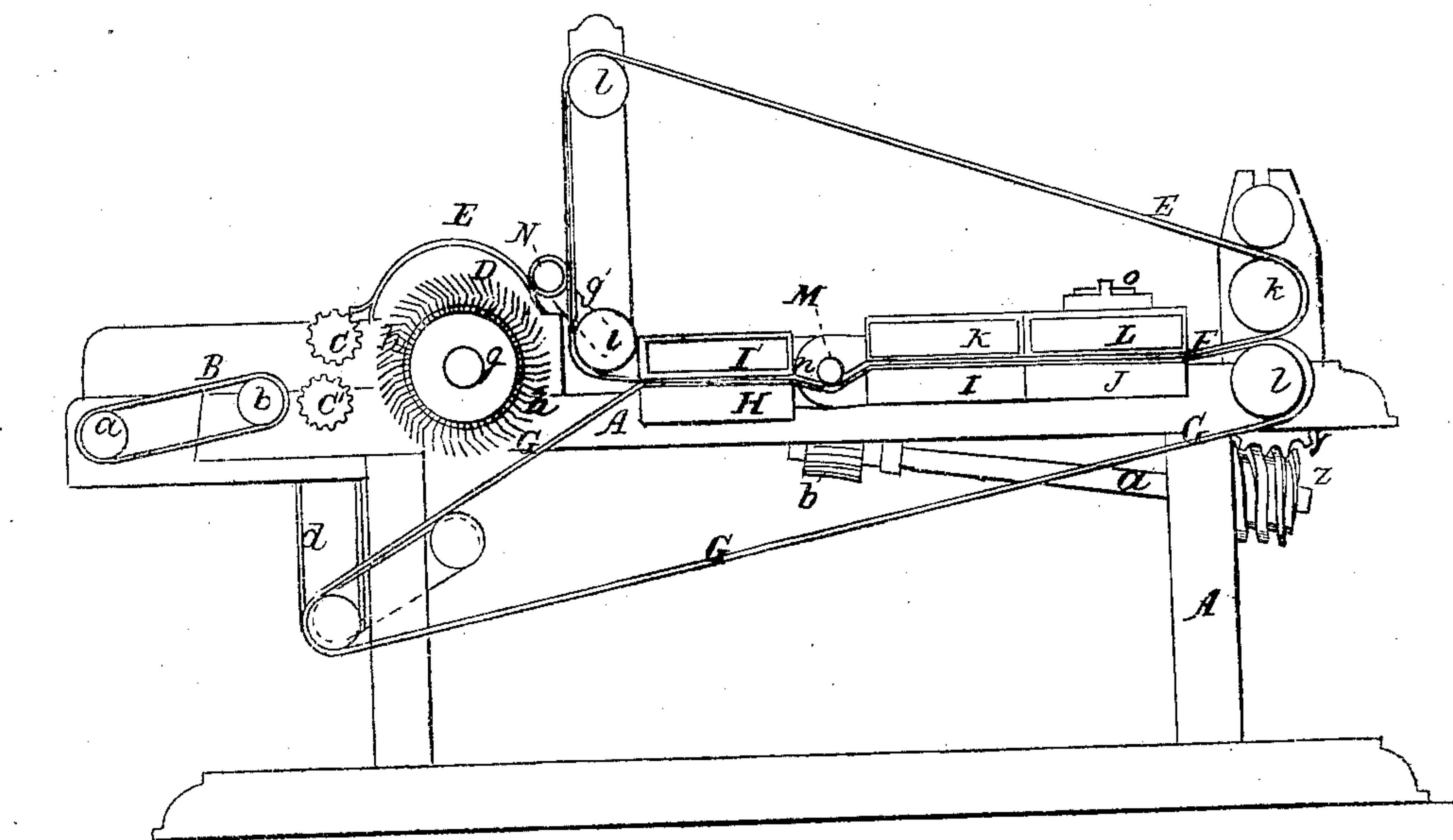


Fig. 3.



Witnesses
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United States Patent Office.

ENOCH WAITE, OF SOUTH NATICK, MASSACHUSETTS.

Letters Patent No. 65,455, dated June 4, 1867.

IMPROVEMENT IN FELTING MACHINES.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL PERSONS TO WHOM THESE PRESENTS SHALL COME:

Be it known that I, ENOCH WAITE, of South Natick, in the county of Middlesex, and State of Massachusetts, have invented an improved Machine for Manufacturing Felt; and do hereby declare the same to be fully described in the following specification, and represented in the accompanying drawings, of which—

Figure 1 is a top view.

Figure 2, a front elevation.

Figure 3, a longitudinal section; and

Figure 4 a rear elevation of it.

The nature of my invention consists in a combination of two or more felting platens, and mechanism, as hereinafter described, for moving one or more of them in directions longitudinal, and the other or others in directions transverse of the sheet of felt while it is being made by and between them.

Also in the combination of a card cylinder with the feeding mechanism, the carrying aprons, and the felting table or tables, and the platen or platens thereof.

Also in the combination and arrangement of a transversely grooved roller with the card cylinder, the carrying aprons, and one or more felting tables and platens, the purpose of such roller being to prevent waste of the fibrous material.

In the drawings, A denotes the frame of the machine, it being suitably constructed for supporting the operative parts or mechanism to be hereinafter explained. At the rear of the frame is an endless feeding apron, B, supported by two rollers, *a b*, the shaft of the inner of which has a gear, *c*, fixed on it, at one end of it. The said gear engages with another gear, *d*, which, in its turn, plays into the lowermost of the gears *e f* applied respectively to the shafts of two fluted feed-rollers C C' which are arranged just in advance of the feeding apron B. In front of the said feed-rollers there is a rotary card cylinder, D, which consists of a cylinder, *g*, having card clothing *h* about its periphery. There is a curved case or housing, E, arranged over and above the cylinder D, in manner as shown in figs. 1, 2, and 3. In advance of and underneath the said cylinder two carrying and batting endless aprons, F and G, are arranged, in manner as shown in the drawings, they being supported by suitable guide and operating rollers, as shown at *i i*, *k l*, the two rollers *k l* being at the rear part of the machine. The two aprons F G pass together over a set of beds or tables, H I J, and between them and movable platens I' K L, arranged respectively over such tables. A shaft, M, extends across the frame and between the platens I' K, and carries eccentrics *m m*, which operate arms *n n n n* that embrace such eccentrics, and are jointed to the ends of the platens, the same being so as to impart to each platen, during each revolution of the shaft, a short reciprocating movement in a direction longitudinal of the machine. The third platen L, instead of having a movement in such direction, is to have imparted to it a reciprocating movement transversely of the machine, or the sheet of felt while being made thereon. For this purpose an arm, *o*, jointed to the platen L, and embracing an eccentric, *p*, carried by an upright shaft, *q*, is employed. The said shaft *q* is put in revolution by means of a crossed band, *r*, which works around it or a pulley on it, and also around a pulley, *s*, fixed on the driving-shaft M. The card cylinder D receives its rotary motion by means of a crossed belt, *t*, which not only works around a pulley, *u*, on the driving-shaft, but goes around a pulley, *v*, fixed on the shaft of the said cylinder, the same being as shown in the drawings. For operating the two endless aprons F G the shafts of their rollers *k l* are connected by gears *w x*, one of which is shown in fig. 4 as below the other, and by dotted lines, it being aside of a worm-gear, *y*, which is fixed on the shaft of the lower roller. A worm or screw, *z*, carried by a shaft, *a'*, (see fig. 4,) engages with the gear *y*, such shaft *a'* being caused to revolve by means of a worm-gear, *b'*, fixed on it, and made to engage with a screw or worm, *c'*, carried by the driving-shaft M. In order to operate the feeding rollers an endless belt, *d'*, is extended not only around a pulley, *e'*, fixed on the shaft of the front roller of the lower endless apron, but about a pulley, *f'*, fixed on the shaft of the lower feeding roller, the whole being as shown in figs. 1 and 4. Between the upright part of the upper endless apron and the rear part of the curved case E of the said cylinder D there is a creased roller, N, whose shaft is supported by radial arms *g' g'* which extend from the shaft of the lower guide-roller of the upper apron, such arms being so applied to the said shaft as to be capable of turning and sliding freely up and down thereon in such manner as to enable the creased roller to be moved by the housing of the

card cylinder toward and against the upper apron. The roller N is grooved transversely, the several grooves extending entirely around it.

In certain felt-making machines recently invented by me, and patented to me and my assigns, I have made use either of a rotary beater or a picker, which were arranged in advance of the feeding-rollers. In lieu of such a beater or picker I employ in the present machine, as above described, a cylinder covered on its curved surface with "card clothing" or wire teeth fixed in a sheet of leather and projecting therefrom, such "card clothing" being well known and in common use in carding engines.

The card cylinder, like the picker and beater, not only operates to transfer the fibrous material from the feed-rollers to the felting mechanism, but it performs an additional duty or function not incident to them, viz, the carding of the material or the combing of the fibres preparatory to their being released by the feed-rollers and thrown on the lower apron. Furthermore, the grooved roller N, by being placed within the angle of the upper apron and the housing of the card cylinder, and kept against the apron by the said housing, will be revolved by the apron while the latter may be in movement. The principal object of the said creased roller is to catch the filaments or fibrous material which may be carried up in front of the card cylinder by the draught of air created by such cylinder. These filaments being intercepted by the roller will be transferred by it to the card cylinder, which will seize them and remove them from the roller, the upward current of air being caused to escape through the grooves or creases of the roller. The filaments so taken from the creased roller will be thrown upon the lower carrying apron, which, with the others deposited on it, will be carried between the two aprons and the felting-tables and platens, and by the latter be worked or converted into a sheet of felt.

When the felting-platens move in one direction only, it is found that the sheet of felt will be stronger in one way than it is in a direction at right angles thereto, and therefore it is in order to equalize the strength of the felt in longitudinal and transverse directions that I make use of the additional platen moved transversely of the sheet of felt, the other platen or platens being moved longitudinally of such sheet.

I claim the combination of the card cylinder, the feeding mechanism, the carrying aprons, and one or more felting-tables, and the platen or platens thereof, working longitudinally of the machine, the whole being arranged substantially as described.

I also claim the combination of the transversely grooved roller N, the card cylinder, the carrying aprons, and one or more sets of felting-beds and platens, arranged substantially as and so as to operate as specified.

I also claim the combination of one or more sets of felting-platens and mechanism for moving them transversely to the sheet of felt, with one or more sets of such platens and their mechanism for moving them longitudinally of the sheet of felt, the whole being substantially as and for the purpose as hereinbefore described.

I also claim the combination of the feeding mechanism, the card cylinder, the two endless aprons, the beds, and longitudinally and transversely working platens provided with machinery for operating them, substantially as described.

ENOCH WAITE.

Witnesses:

R. H. EDDY,
F. P. HALE, Jr.