

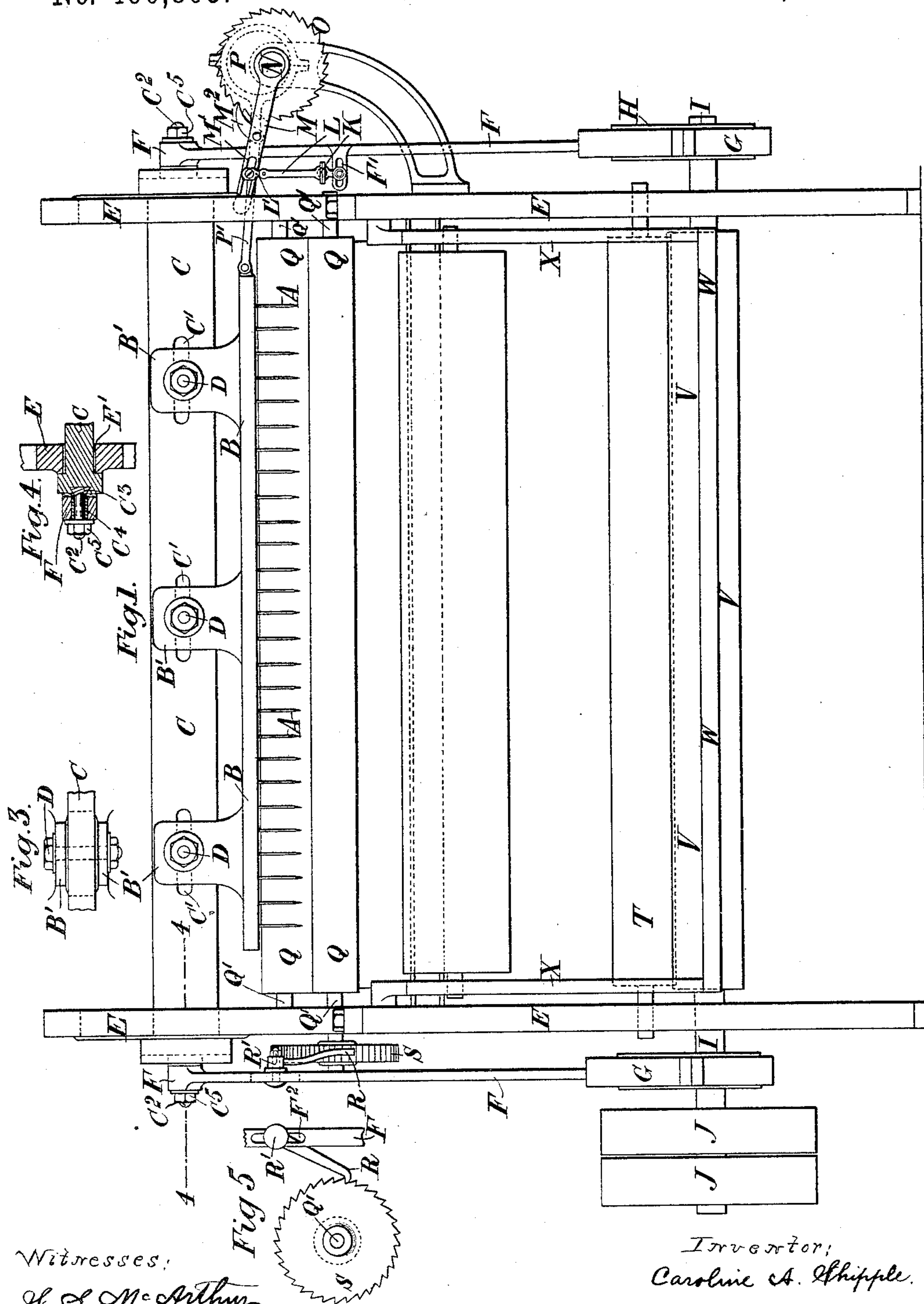
(No Model.)

2 Sheets—Sheet 1.

C. A. WHIPPLE.
FELTING MACHINE.

No. 460,805.

Patented Oct. 6, 1891.



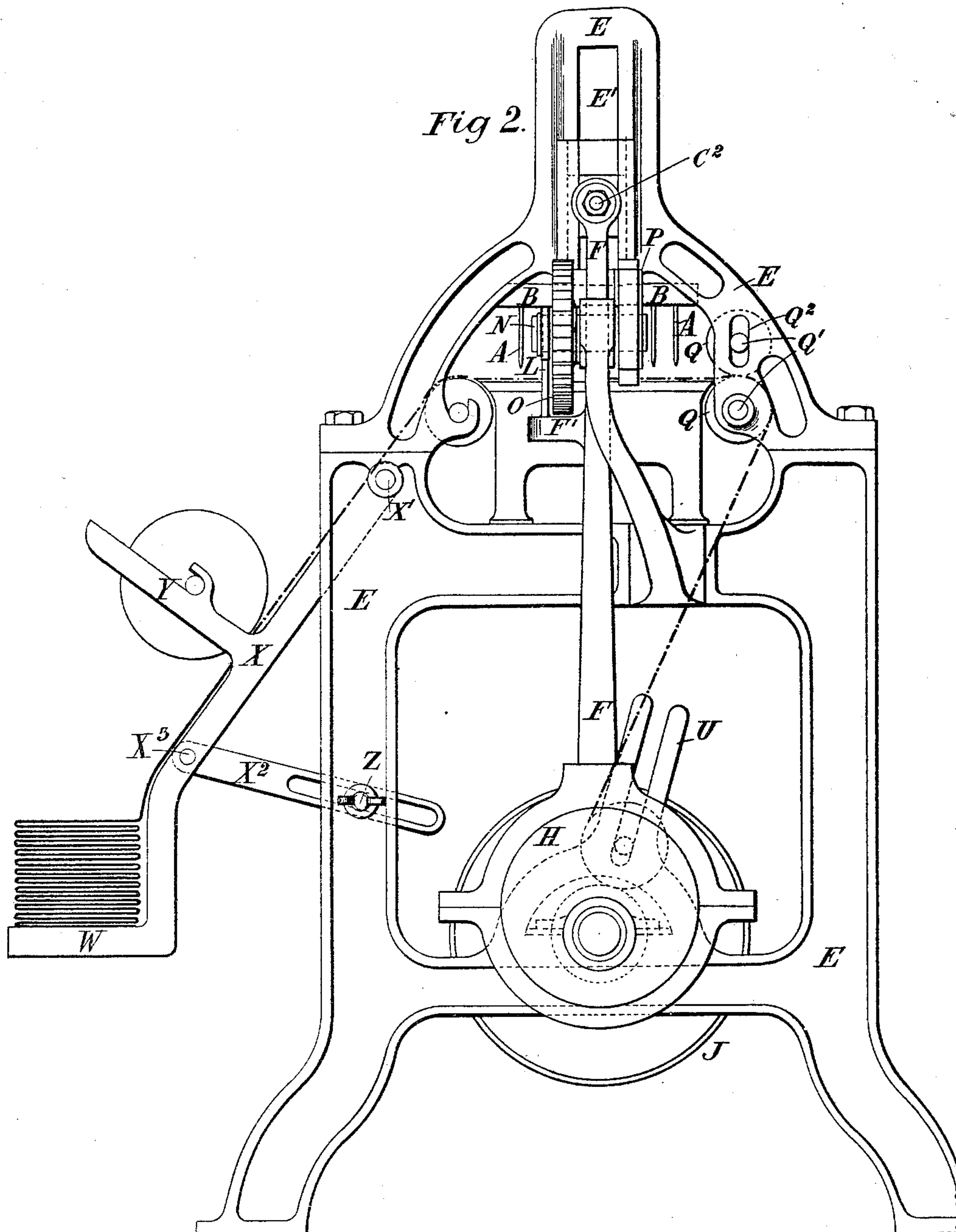
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Witnesses:

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UNITED STATES PATENT OFFICE.

CAROLINE AUGUSTA WHIPPLE, OF LONDON, ENGLAND.

FELTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 460,805, dated October 6, 1891.

Application filed February 27, 1891. Serial No. 383,321. (No model.)

To all whom it may concern:

Be it known that I, CAROLINE AUGUSTA WHIPPLE, a subject of the Queen of England, residing at London, England, have invented certain new and useful Improvements in Felting-Machines, of which the following is a specification.

This invention relates to those machines used in the manufacture of woolen, felted, textile, and similar fabrics in which the fibers of one material or substance are interlaced with the fibers of another material for the purpose of felting them together and strengthening the fabric and making the texture closer and stronger, and by which means a common fabric may be faced with a superior material. The interlacing of the fibers is effected by causing barbed or roughened needles to be passed backward and forward through the materials to be treated.

Generally the machine consists of a suitable frame-work having a bed over which the material to be operated upon is carried, the needles passing through it and into interstices in the bed as the material travels. Usually a foundation of common material is provided, and over this is a layer of the better material or substance to be incorporated with the foundation. This better material may be itself a fabric or may be a perfectly loose lap, like cotton-wool, or whatever material may be desired. The materials are drawn by suitable means through the machine under the needles, which, rapidly reciprocating vertically, pass and repass through the materials, the barbs or projections of the needles intercalating the fibers, so as to form a single fabric as it leaves the machine.

In the accompanying drawings, Figure 1 is a side elevation of the machine; Fig. 2, an end elevation, and Figs. 3, 4, and 5 details of parts of the mechanism. Fig. 2 is drawn to a larger scale than Figs. 1, 3, 4, and 5.

Like letters represent like parts throughout the drawings.

The needles A are carried in a plate or frame B, connected with the vertically-reciprocating bar C, in such a manner that, while compelled to reciprocate vertically with the said bar C, the needle-plate may travel independently of the bar C in a horizontal direction, this connection being shown in detail in

Fig. 3, from which it will be seen that the plate B has a jaw or bracket B', within which the bar C is placed. The bolt D passes through the jaw B' and the slot C' in the bar C. In the drawings three of these jaws or connections are shown, and, as will readily appear, the arrangement is such that the bolts D are caused to rise and fall with the bar C, thus taking the needle-plate B with them, but are free to travel in a horizontal direction backward and forward within the slots C'.

The bar C is carried at each end in the upper portion of the standards E in suitable guides or slots E', in which the ends of the bar are retained. A cross-section on line 4-4 of Fig. 1 of this portion of the apparatus is shown in Fig. 4, where E is the standard, C the bar, and C² a bolt carried in a V-groove C³ in the end of the bar C.

C⁴ is a sleeve upon the bolt C², so that when the nut C⁵ is screwed up tight the head of the bolt is jammed firmly in the end of the bar C, while if the nut is slackened the position of the bolt in the slot can be altered as circumstances require. This accommodation is for the purpose of adjusting the height of the needle-plate B according to the thickness of the work or the length of the needles.

F is an eccentric-rod bored to fit over the sleeve C⁴, so that while the bolt may be jammed tight the end of the eccentric-rod is free to turn upon the sleeve C⁴. The eccentric-rod F carries at its lower end straps G, surrounding the eccentric H, and the whole of this arrangement is in duplicate, one portion of it at each end of the machine. The eccentrics H are carried upon the shaft I, which is the main driving-shaft of the machine and carries the usual fast and loose pulleys J. As this shaft revolves the eccentrics H revolve with it, and their motion being transferred to the bar C by means of the eccentric-rods F the bar C, and with it the needle-plate B, is reciprocated vertically.

The horizontal reciprocation of the needle-plate B and needles A is effected in the following manner: It is not necessary or desirable that one complete horizontal reciprocation should take place for each vertical reciprocation, and it is preferred that the horizontal traverse should be slowly effected. For this purpose one of the eccentric-rods F

(that shown on the right hand of Fig. 1 of the drawings) carries a slotted bracket F' , through which passes a bolt to secure one portion of a ball-and-socket joint K , the slot being for the purpose of fixing the said ball-and-socket joint nearer to or farther from the eccentric-rod. The object of the ball-and-socket joint is to accommodate the various motions involved in the movement in different planes of the eccentric-rod F and rocking arm M , presently to be described; but it will be seen that other forms of joint accommodating these movements may be employed instead of the particular joint herein described and illustrated. A link L carries the other portion of the ball-and-socket joint and is pivoted to a small bracket L' , adapted to be fixed in any required position in a slot M' of rocking arm M . This rocking arm M is provided with a hole at the end farthest from the slot, which passes over a short shaft N , which carries a ratchet-wheel O and an eccentric P , the latter shown in dotted lines in Fig. 1. Upon the arm M is pivoted a pawl M^2 , adapted to engage with the teeth of the ratchet-wheel O , and the eccentric P is connected by an eccentric-rod P' with one end of the needle-plate B . The action of this portion of the mechanism is as follows: As the eccentric-rod F reciprocates, the link L , connected with it through the ball-and-socket joint K , conveys this motion to the rocking arm M , which, by the pawl M^2 , moves the ratchet-wheel O at every stroke of the eccentric-rod F . The number of teeth compassed by the pawl M^2 at each stroke may be varied by the position in the slot M' of the bracket L' . When the bracket is nearer the center of the shaft N , the pawl has a longer traverse, and when farther from it a shorter traverse. The slotted bracket F' enables the bottom end of the link L to be suitably placed, according to the position of the bracket L' in the rocking arm M .

It is desirable that the fabric should be drawn away from the needles as it is completed. This may be effected in a variety of ways; but I prefer to adopt the following simple mechanism: I provide at a convenient distance behind the needles one or a pair of horizontal rollers Q , carried upon shafts or equivalents Q' ; or a series of rollers may be arranged upon one or more shafts. Between this pair of rollers or around the series of rollers passes the completed fabric, and is from there carried to a beam, upon which it is rolled as made. At least one of the rollers Q may be positively driven, and, if necessary, all of them may be so driven, and it is desirable that one of the upper rollers should be capable of pressing, either by its own weight or under the influence of other weights or springs, upon one or more of the other rollers, so as to securely grip the fabric between them. In Fig. 2 the shaft Q' of the top roller Q is shown carried in a vertical slot Q^2 in the framing E . A means of driving the shaft Q' of one of the rollers Q is illustrated in Fig. 1.

The eccentric-rod F at the end of the machine remote from that which carries the horizontal reciprocating mechanism for the needle-plate carries a spur or pawl R , fixed in the required position by means of the bolt R' . This pawl R has a hooked end, which engages with the teeth of a ratchet-wheel S , carried upon the shaft Q' of the roller Q , and the action is that as the eccentric-rod F rises the pawl R engages with a tooth of the ratchet-wheel S , thus pulling that wheel round to a certain extent. If necessary, the pawl R may be pivoted and provided with a spring or weight attachment to cause it to engage with the teeth of the wheel S ; but as the angle of the pawl R can be altered by slackening the bolt R' and its position upon the eccentric-rod F may be altered by moving the bolt R' in the slot F^2 of the eccentric-rod, and as, moreover, the motion of the shaft I is so arranged that the eccentric-rod F is nearest to the wheel S as it rises and farthest from it as it descends, such a provision would be scarcely necessary. Any suitable means—such as a pawl—may be provided to prevent the wheel S from returning after it has been pulled round by the pawl R .

If desired, there may be one of the ratchet-wheels S at each end of the shaft Q' , and a spur or pawl R may be provided upon each of the eccentric-rods F .

The beam T , upon which the fabric is wound, may be carried in a fork U at each end of the machine, the beam resting upon a roller V , carried upon the shaft I , in such a manner that the said beam is caused to revolve, and thus wind the cloth upon it; or the beam T may rest directly upon the shaft I , or other intermediate rollers or gearing may be employed, so as to secure the correct rate of revolution to the beam T necessary to wind the fabric upon it. The object of the forks U is to allow the shaft of the beam to rise within them as the roll of fabric increases in diameter, and as this beam or roll of fabric is driven from the periphery and not from the center the speed at which the fabric is rolled up would not increase with the diameter of the roll.

By reference to Fig. 2 it will be seen that the foundation of the fabric is carried upon the shelf or platform W of an adjustable bracket X , while the superior or facing material is carried on a roll in arms Y , projecting from the said bracket X . The bracket X is pivoted at its upper end at X' and carries slotted arms X^2 , pivoted to X at X^3 , and adapted to be fixed in the frame-work by the thumb-screw Z . By this means the position of X can be varied as required.

I wish it to be understood that I am aware that machines for the manufacture of fabrics of this nature have before now been made embracing most of the general functions of this machine, and that consequently no claim is made to anything beyond the particular structural details of this machine.

I claim—

1. The combination, with the needle-plate, of the eccentric-rod connected to vertically reciprocate said plate, an eccentric-rod connected to horizontally reciprocate said plate, and connections between the vertically-reciprocating eccentric-rod and the horizontally-reciprocating eccentric-rod, whereby the latter is operated by the former, substantially as described.

2. The combination, with the needle-plate and eccentric-rod connected to vertically reciprocate the same, of an eccentric-rod connected to horizontally reciprocate the same, a shaft, an eccentric for said latter rod mounted on the shaft, a rocking arm also mounted on the shaft, a pawl on the rocker, a ratchet-wheel engaged by the pawl, and a link connecting the rocking arm with the vertically-reciprocating eccentric-rod, substantially as described.

3. The combination, with the needle-frame,

the shaft N, and connections between the needle frame and shaft, of a rocking arm on the shaft, a vertically-reciprocating eccentric-rod, and a link provided with a ball-and-socket joint connecting the eccentric-rod and the rocking arm, substantially as described.

4. In a machine such as described, the combination, with the bar C, having longitudinal slots C', of the needle-plate B, carrying jaws or brackets B', lightly grasping the bar C, and bolts D, passing through the brackets B' and the slots C', substantially as and for the purpose described, and illustrated in the accompanying drawings.

In testimony whereof I have hereto set my hand in the presence of the two subscribing witnesses.

CAROLINE AUGUSTA WHIPPLE.

Witnesses:

HARRY B. BRIDGE,

WILLIAM W. RICHARDSON.