No. 816,018. PATENTED MAR. 27, 1906.

H. KRAEMER.

SINGEING MACHINE.

APPLICATION FILED MAR. 26, 1904.

4 SHEETS—SHEET 1.

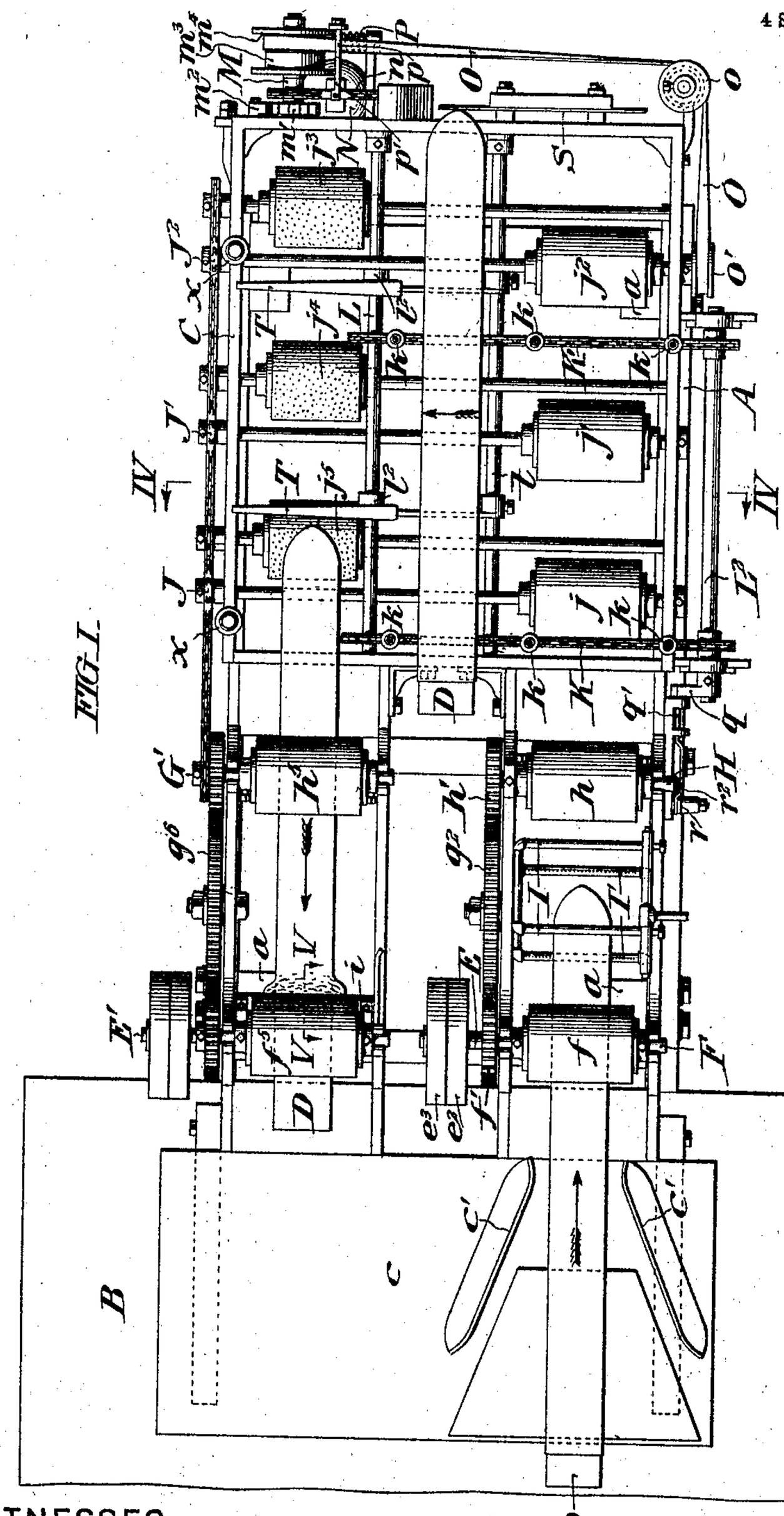

FIG. I.

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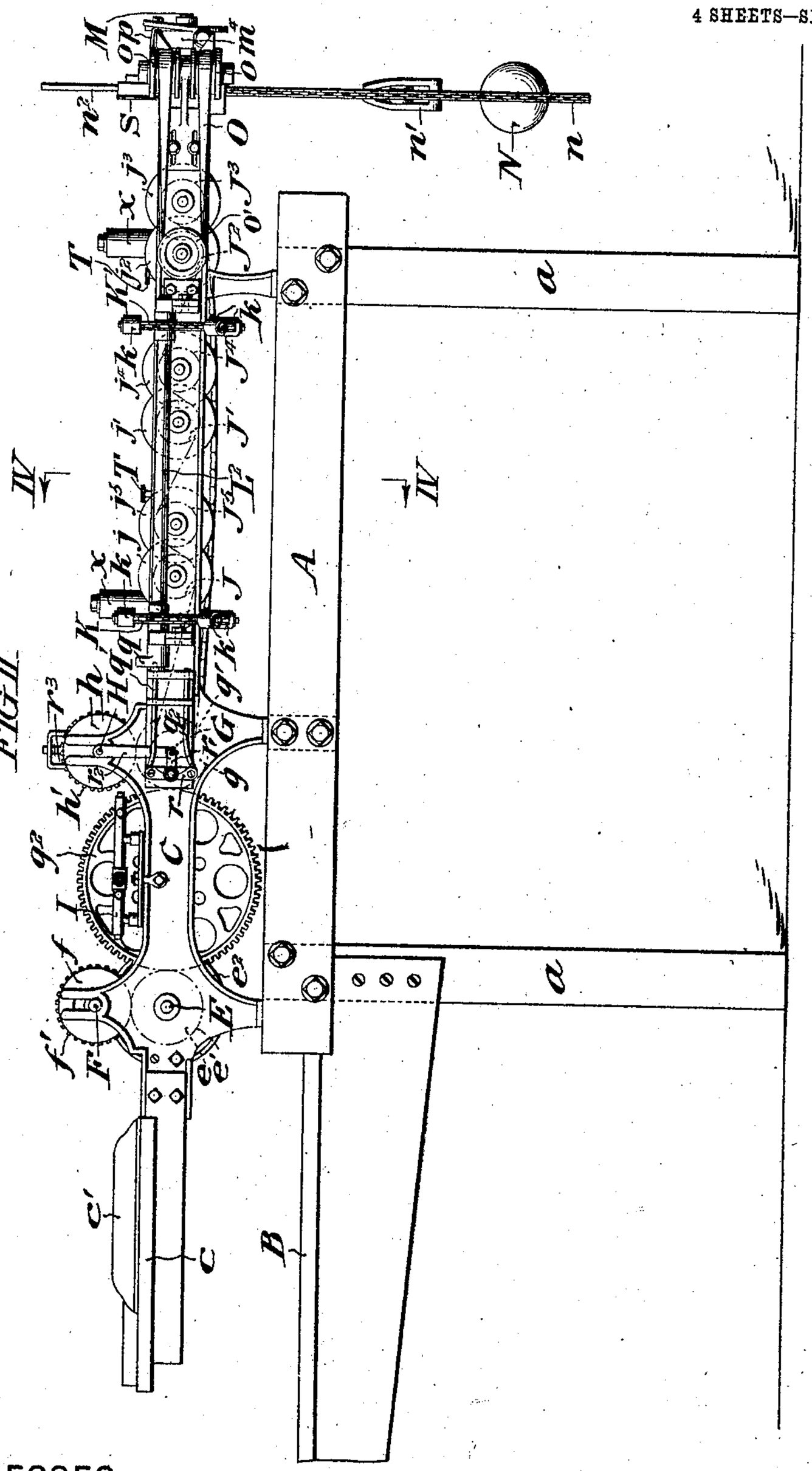

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4 SHEETS—SHEET 3.

FIG. III.

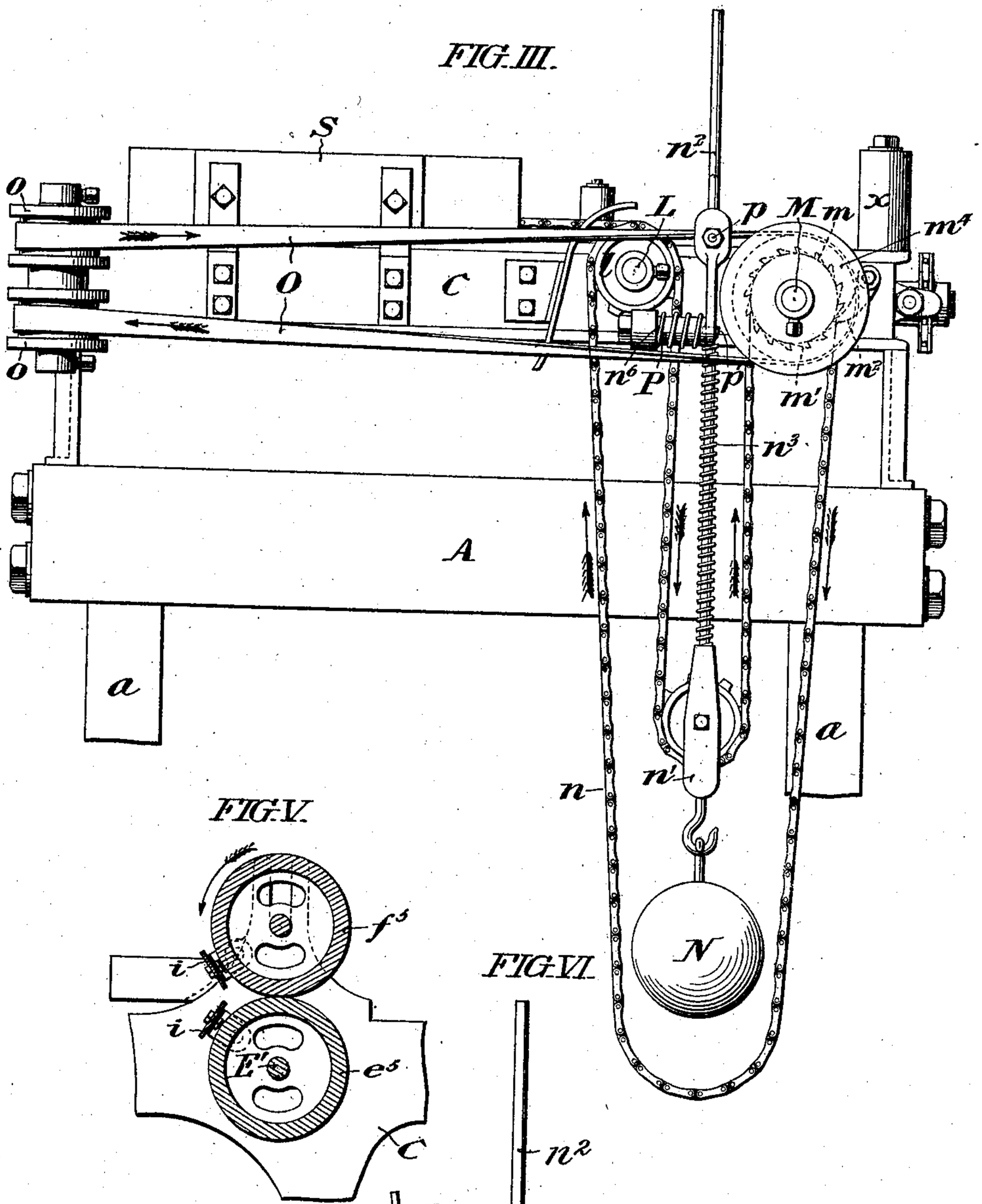
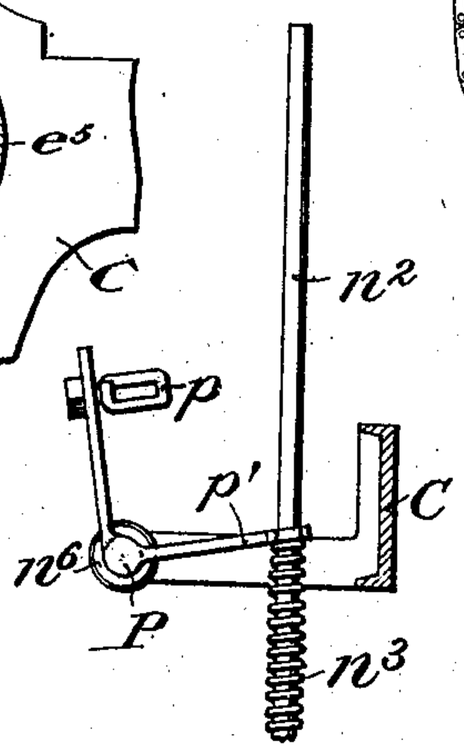


FIG. V.

FIG. VI.



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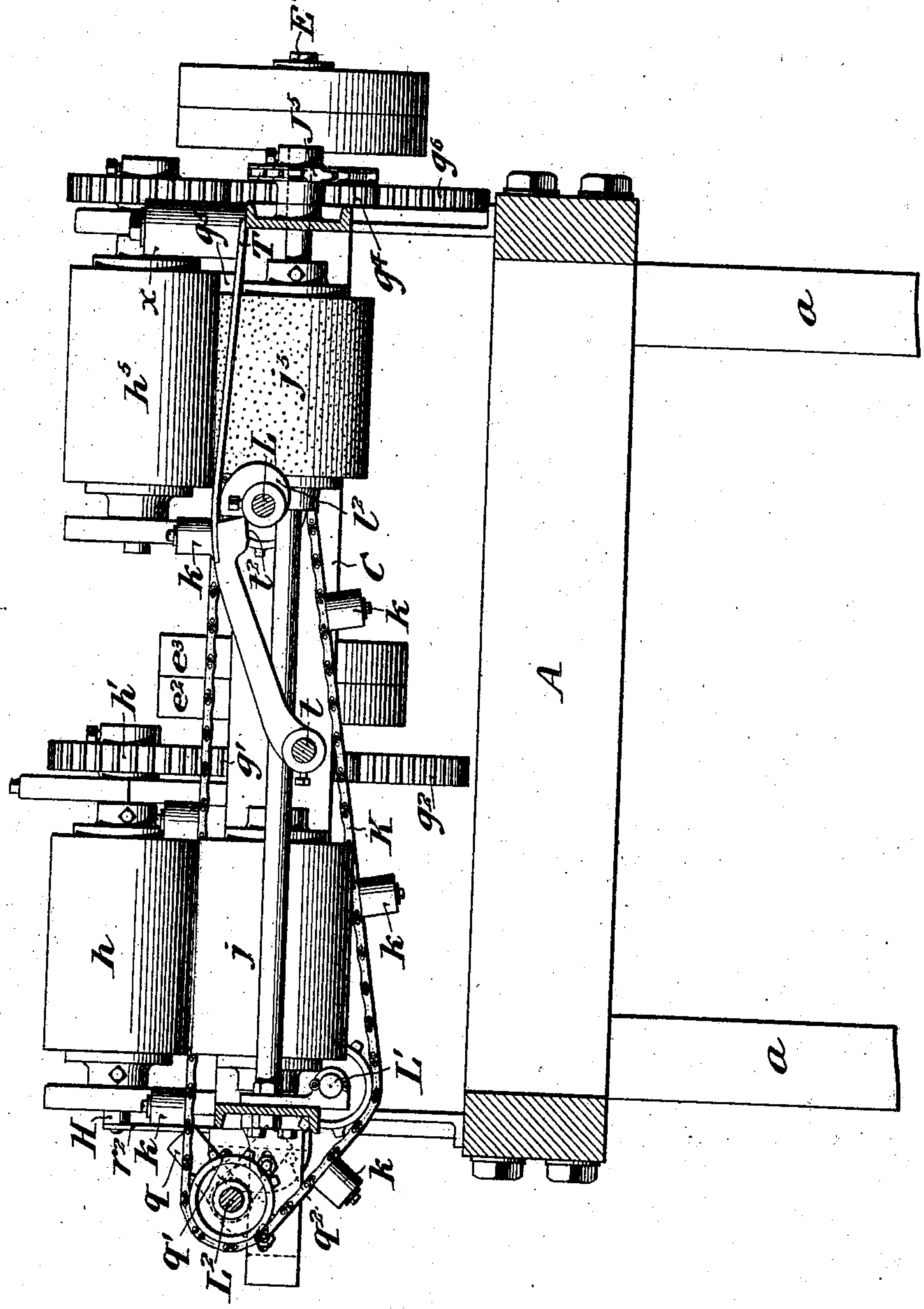
4 SHEETS—SHEET 4.

FIG. IV



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UNITED STATES PATENT OFFICE.

HENRY KRAEMER, OF NAZARETH, PENNSYLVANIA.

SINGEING-MACHINE.

No. 816,018. Specification of Letters Patent. Patented March 27, 1906.

Application filed March 26, 1904. Serial No. 200,186.

To all whom it may concern:

Be it known that I, HENRY KRAEMER, a citizen of the United States, residing at Nazareth, in the county of Northampton and State of Pennsylvania, have invented a new and useful Singeing-Machine, whereof the following is a specification, reference being had to the accompanying drawings.

My invention relates to a machine designed primarily for subjecting shaped textile products to a singeing operation.

The machine which I have shown and will describe is especially adapted to the singeing of stockings; but the invention is not thus limited, as it may be adapted for use in connection with other similar textile products.

In order to perform the singeing operation to the best advantage, the stocking is placed upon a block or form, and it is while carried by the block that the singeing operation is performed. My invention includes the devices by means of which the block, with its stocking, is carried between the singeing-jets. It also includes a stripping device by means of which after the singeing operation is performed the singed stocking is stripped off its block and allowed to fall into a convenient receptacle. It also includes a reversing device comprising parallel sets of rolls running in opposite directions with a transfer device by means of which the block carrying the stocking after passing foot first through the singeing device is reversed in motion, so as to pass top first through the stripping device. By employing this it is possible to arrange the point of delivery of the blocks from the stripping device in immediate proximity to the point where they are to be again fed into the machine after having received another stocking, which is placed upon the block by an operator stationed at that end of the machine.

In the accompanying drawings, Figure I is a plan view of a singeing-machine embodying my invention. Fig. II is a side elevation of the same. Fig. III is an enlarged rear elevation. Fig. IV is an enlarged vertical section along the line IV IV, Figs. I and III. Fig. V is a partial section along the line V V, Fig. I. Fig. VI is a detail view of certain parts hereinafter more particularly described.

The machine is mounted upon a rectangular frame A, which may be of squared timber supported upon standards *a a*. At the front end of the frame there is provided a broad table B, projecting from and supported by the frame This table may conveniently be used to carry the stockings which are to be successively placed by an operator upon blocks in order that they may be passed through the singeing-machine. Supported upon the rectangular frame is a rectangular housing C, in which are provided all the necessary journals for the rollers and shafts which will be described. At the front end of the housing is formed a projecting shelf *c*, which is over the table B. At that side of this shelf from which the stockings are fed to the machine it is provided with a pair of guide-flanges *c' c'*, by means of which the block D, with a stocking pulled over it, is accurately fed between the rollers at the point where it is to commence its course through the machine.

The shaft E carries a roller *e*, a pinion *e'*, and a set of fast and loose pulleys e^2 e^3, from which it may be driven. The shaft F carries a companion roller *f* and a pinion *f'*, meshing with the pinion *e'*. It is carried in open bearings and is situated over the shaft E, so that roller *f* rests with its weight upon roller *e*. The shaft G carries a roller *g* and a pinion *g'*, by means of which it is driven from the pinion *e'* with interposition of the gear-wheel g^2. The shaft H has open bearings and carries a companion roller *h*, resting on roller *g*, and a pinion *h'*, which meshes with the pinion *g'*. Between the two pairs of rollers thus described are the burners, consisting of two rectangular sets of gas-piping, one above and the other below the path which the block D, with its stocking, takes as it passes from one pair of rollers to the other. The upper set I has jets projecting from its lower edges, and likewise the lower set I' has jets projecting from its upper edges, so that as the stocking passes between them both top and bottom surfaces are simultaneously effectually subjected to the singeing operation.

The parts which I have thus far described constitute the singeing apparatus proper. Immediately alongside of this is the stripping apparatus, which in some respects is a counterpart of the singeing apparatus and which I will therefore next describe.

The shaft E' carries in addition to the fast and loose pulleys by which it is driven a pinion and the roller e^5. (See Fig. V.) Over the latter roller rests in open bearings the companion roller f^5. The shaft G' carries the pinion g^4 and the roller g^5. It derives its motion from the pinion on the shaft E' by means of the interposition of the large gear-

wheel g^6. It has a companion roller h^5, resting in open bearings immediately above the roller g^5. The rollers which constitute the stripping apparatus are located in the direction opposite to those which constitute the singeing apparatus, the blocks, with their stockings, which have passed through the former being passed in the reverse direction through the latter.

i i are a pair of stripping-blades (see Fig. V) which are adjustably mounted in such position that as the block passes between the rollers it is drawn between the blades, the interval at which they are adjusted being such as to allow the block to pass freely through, while the edges of the blades draw the stocking from the block, the block passing back upon the shelf c ready to be received by the operator and to have another stocking placed upon it, while the stocking which has been stripped from it falls into a receptacle provided for the purpose. It will be noted that the blades i i are inclined so that their opposing edges are directed forward in the direction in which the block moves between them. This serves to prevent the possibility of any tearing of the object to be stripped from the block.

I will now describe the transferring and reversing device by which the block which has passed through the singeing apparatus is transferred laterally from the line of motion of said singeing apparatus to the line of motion of the stripping apparatus with an accompanying reversal of the direction in which the block travels.

j j' j^2 j^3 j^4 j^5 are a series of feed-rollers, the shafts of which carry the corresponding sprocket-wheels J J′ J² J³ J⁴ J⁵, all of which are upon the same side of the machine as that occupied by the stripping apparatus. This series of sprocket-wheels is driven by a sprocket-chain from a sprocket-wheel mounted upon the shaft G′. The upper portion of this sprocket-chain passes alternately above and below the sprocket-wheels of the series, so that while it drives the rollers j, j', and j^2 forward the rollers j^3, j^4, and j^5 are driven backward. The rollers may preferably be clothed with any rough material, as sandpaper.

K and K′ are parallel and similar endless carrying-chains each provided at similar intervals with projecting studs or rollers k. Both of these endless chains are carried by and pass around sprocket-wheels mounted, respectively, upon the longitudinal shafts L L′ L². The chains are driven by the rotation of the shaft L, the motion of which is derived as follows: At the rear end of shaft L is a sprocket-wheel l. Parallel to shaft L is a short longitudinal shaft M, which carries a sprocket-wheel m and a ratchet-wheel m', both of which are fast upon shaft M. The ratchet-wheel is controlled by a detent m^2. The shaft M also carries a pair of fast and loose pulleys m^3 m^4. An endless chain n passes around sprocket-wheels l m, hanging loosely, so as to form both an internal and an external fold. Within the internal fold this chain carries a pulley-block n', from which depends a weight N. The fast and loose pulleys m^3 m^4 are driven by a belt O, which turns at right angles around the rollers o o and passes around the pulley o' upon the shaft which carries the sprocket J², from which it derives constant motion. When the belt is on the fast pulley, sprocket m is driven so as to move the chain in the direction to lift the weight N. When the belt O is on the idle pulley, sprocket m is kept from reverse rotation by the engagement of the spring-pressed detent m^2 with the ratchet-wheel m'. The pulley-block n', upon which the weight N is hung, carries on top a vertical rod n^2, around which is set a coiled spring n^3. A belt-shifter p is mounted upon an arm upon a rock-shaft P, encircled by a coiled spring n^6, which normally tends to rotate the shaft P to shift the belt O from the idle to the fast pulley. The rock-shaft P carries a horizontal arm p' through a hole in which the rod n^2 freely passes. The descent of this rod is permitted by an intermittent motion of the sprocket-wheel l, as will shortly be described. The coiled spring n^3 is freely interposed between the top of the pulley-block n' and the arm p', and as the lifting of the weight proceeds this spring is gradually compressed between the two until its tension, overcoming the tension of the spring n^6, is sufficient to rotate the rock-shaft P to shift the belt upon the idle pulley; but when the rod n^2 again descends the spring n^3 gradually ceases to press against the arm p' and allows the spring n^6 to rotate the shaft P, moving the shifter p to shift the belt 6 from the idle to the fast pulley, whereupon the weight is again raised. This intermittent motion of the sprocket l is part of an intermittent rotation of the paired carrying-chains K K′. The weight N tends constantly to effect this rotation; but an intermittent check is placed upon it by reason of an escapement-arm q, set upon the shaft L². As this arm rotates, it contacts successively with the projecting ends of a pair of slide-rods q' q^2. The ends of these slide-rods are pivoted to the opposite ends of a centrally-pivoted lever r. This lever has a third arm r', which is connected by a link r^2 to the projecting end of the shaft H, which carries the roller h, the other end of shaft H being counter-depressed in its open bearing by a spring r^3. When this roller is in contact with its fellow roller g, the lever r is in the position shown in Fig. II, where the slide-rod q' projects at its end so as to interfere with the further downward rotation of the arm q, holding it in the position seen in Fig. IV. When, however, a block, with its

stocking, is fed under the roller h, it is raised, and by its elevation the lever r is rocked so as to withdraw the rod q' sufficiently to allow downward rotation of the arm q, at the same time, however, projecting the end of the slide-rod q^2, so as to cause it to check the rotation of the arm q as soon as it has reached the dotted position shown in Fig. IV. Here it remains until the block has passed completely through the pair of rollers g h. As soon as this occurs the roller h descends, again rocking the lever r back to the position of Fig. II, in which while the end of slide-rod q' is again projected into the path of the arm q the end of the slide-rod q^2 is withdrawn from its path, so that the arm q is allowed to make nearly a complete revolution, (as the weight N constantly tends to cause it to do,) until it comes into the position shown in Fig. IV, and the operation repeats itself.

It will be evident that by the operation of the parts thus described the intermittent feeding of the blocks through the rollers of the singeing apparatus causes the endless chains K K′ to have an intermittent motion, one complete revolution of the arm q occasioning a movement of the chains equaling in extent the distance between the studs k k. Each such intermittent feed permits the weight N to descend a corresponding distance, and as a result after a number of such successive intermittent feedings have occurred it is necessary to have the weight reraised. This is accomplished by the intermittent operation of the sprocket-wheel m, which has been described. As a block emerges from the singeing apparatus it is carried backward by the rollers j j' j^2 until its point comes into contact with a fixed stop S. As soon as the end of the block leaves the rollers g h the chains K K′ commence their motion, and the studs k k, engaging the block, carry it sidewise to about the middle line of the machine, as shown in Fig. I. Here it remains until the entrance of another block under the roller h permits a further slight motion of the carrying-chains. The next movement of the chains consequent upon the issuance of the end of this second block from between rollers g and h carries the first-mentioned block as far over as the line of rollers j^3 j^4 j^5, which are rotating backwardly. In order to prevent the gradual movement of the block onto these rollers, a pair of lifting-fingers T T are set upon the longitudinal shaft t. The shaft L carries cams l^2 l^2, running against cam-surfaces t^2 t^2 on the under side of the fingers. As the motion of the chains K K′ occurs which is to carry a block over to the rollers j^3 j^4 j^5 the fingers are slightly elevated by the cams, lifting the block as it moves sidewise a little above the rollers. This position is maintained until the full extent of the sidewise movement has carried the block directly over the line of the rollers. Too great sidewise motion is prevented by the stop-rollers x x. At the proper moment the cams allow the fingers to fall, thereby placing the block suddenly upon the rollers, which immediately carry it to the stripping apparatus.

Having thus described my invention, I claim—

1. In a singeing-machine the combination of singeing means; feed-rollers by which a block carrying the article to be singed is progressed; and a pair of stripping-blades, one on either side of the path pursued by the block as it is fed by the rollers, by which the article which has been singed is stripped from the block.

2. In a singeing-machine the combination of singeing means; feed-rollers by which a block carrying the article to be singed is progressed; said feed-rollers including two positively-driven rollers, and companion rollers resting on the same and carried in open bearings; and a pair of stripping-blades, one on either side of the path pursued by the block as it passes between the positively-driven rollers and the companion rollers, whereby the article which has been singed is stripped from the block.

3. In a singeing-machine the combination of singeing means; feed-rollers by which a block carrying the article to be singed is progressed; and a pair of stripping-blades, independently adjustable in relation to each other, whereby the article which has been singed is stripped from the block.

4. In a singeing-machine the combination of singeing means; feed-rollers by which a block carrying the article to be singed is progressed; and a pair of stripping-blades inclined with their opposing edges directed forward in the direction in which the block moves between them, whereby the article to be singed is stripped from the block.

5. In a singeing-machine, the combination of the feed-rollers; singeing-jets interposed near the path pursued by the object to be singed as it is fed by the rollers; other feed-rollers alongside the first but rotating in the reverse direction; stripping-blades interposed near the path pursued by the object which has been singed as it is fed by the reversed feed-rollers; and a transferring device, whereby the object which has been fed through the singeing-jets is transferred to the line of the stripping device and its motion reversed whereby it is fed therein and delivered alongside the entrance to the singeing device.

6. In a machine for singeing textile products the combination of two parallel series of rollers each moving in opposite directions; singeing-jets in proximity to the path pursued by the object advanced by the first series of rollers; a stop limiting the advance of said object; transferring devices whereby said object when thus stopped is transferred from the first series to the parallel reverse series;

and a stripping device situated in the path pursued by an object advanced by the latter series of rollers, whereby the object which has been singed is stripped from the block upon which it has been stretched, and the block returned to a point near its starting-point.

7. In a machine for singeing textile products, the combination of two parallel series of rollers each moving in opposite directions; singeing-jets in proximity to the path pursued by an object advanced by the first series of rollers; transferring devices whereby the object is transferred from the first series to the parallel reverse series; and a stripping device situated in the path pursued by an object advanced by the latter series of rollers, whereby the object which has been singed is stripped from the block upon which it has been stretched and the block returned to a point near its starting-point.

8. In a machine for singeing textile products, the combination of two parallel series of rollers moving in opposite directions; singeing-jets interposed in proximity to the path pursued by an object advanced by the first series of rollers; and a transfer device for moving an object from one series to the other consisting of endless chains, with means for intermittently progressing said endless chains.

9. A stripping device for removing a textile product from the block on which it is stretched consisting of positively-rotated rollers; and stripping-blades fixed upon either side of the path pursued by a block resting upon said rollers, the interval between the stripping-blades being slightly larger than the block which is to pass between them.

10. In a singeing-machine, the combination of the singeing-jets; companion feed-rolls by which the object to be singed is passed near the jets; reversing-rolls parallel to said feed-rolls; an endless transfer-chain running from one set of rolls to the other; and means for effecting the intermittent motion of said transfer-chain consisting of an escapement device controlled by the movement of the companion feed-rolls, whereby the passage of an object between said companion rolls effects a corresponding motion of the endless chain.

11. In a singeing-machine the combination of singeing-jets; companion feed-rolls by which the object to be singed is passed near the jets; reversing-rolls parallel to said feed-rolls; an endless transfer-chain running from one set of rolls to the other; shafts by which said transfer-chain is carried; a weight constantly tending to advance said endless transfer-chain; and means for rendering said advancement intermittent, consisting of an escapement-arm set on one of the shafts of the transfer-chain, alternately-reciprocating slide-rods interrupting the movement of the escapement-arm, and mechanism whereby the motion of the companion feed-rolls toward or away from each other occasioned by the passage of an object between them imparts a motion of alternate reciprocation to said slide-rods.

12. A reversing device, consisting of two parallel series of rolls moving in opposite directions; endless chains passing from the path of one series of rolls to that of the other; and means for intermittently advancing said endless chains.

13. A reversing device, consisting of two parallel series of rolls moving in opposite directions; endless chains passing from the path of one series of rolls to that of the other; studs on said endless chains; and means for intermittently advancing said endless chains.

14. A reversing device consisting of two parallel series of rolls, moving in opposite directions; endless chains which carry the object to be reversed from one series of rolls to a point over the other series; fingers upon which the object to be reversed is received from the endless chains; and means for depressing said fingers at intervals to drop the object to be transferred upon the latter series of rolls.

15. A reversing device, consisting of two parallel series of rolls moving continually in opposite directions; an endless chain running between the series carried by shafts parallel thereto; and means for intermittently advancing said endless chain consisting of a weighted chain which tends to rotate one of the shafts of the endless chain; and an escapement device whereby at intervals the rotation of one of said shafts is stopped.

16. A reversing device consisting of an advancing series of rolls and a parallel returning series; an endless transfer-chain passing from one series to the other; an escapement device by which the motion of the endless chain is rendered intermittent; a weighted chain tending at all times to progress said endless chain; and a winding-up device for said weighted chain consisting of fast and loose pulleys, a driving-belt and belt-shifter connection by which motion of the fast pulley winds up the weighted chain, and connections by which when the weight is up the belt is thrown to the loose pulley, while when it is down it is thrown to the fast pulley.

In witness whereof I have signed my name to this specification, this 16th day of March, 1904, in the presence of two subscribing witnesses.

HENRY KRAEMER.

Witnesses:
JOHN J. ROTH,
A. G. SCHMIDT.