No. 619,425. Patented Feb. 14, 1899.

T. R. MARSDEN.

MEANS FOR REGULATING FEED OF TEXTILE MATERIALS TO OPENERS.

(Application filed Sept. 28, 1897.)

(No Model.) 4 Sheets—Sheet 1.

FIG. 1

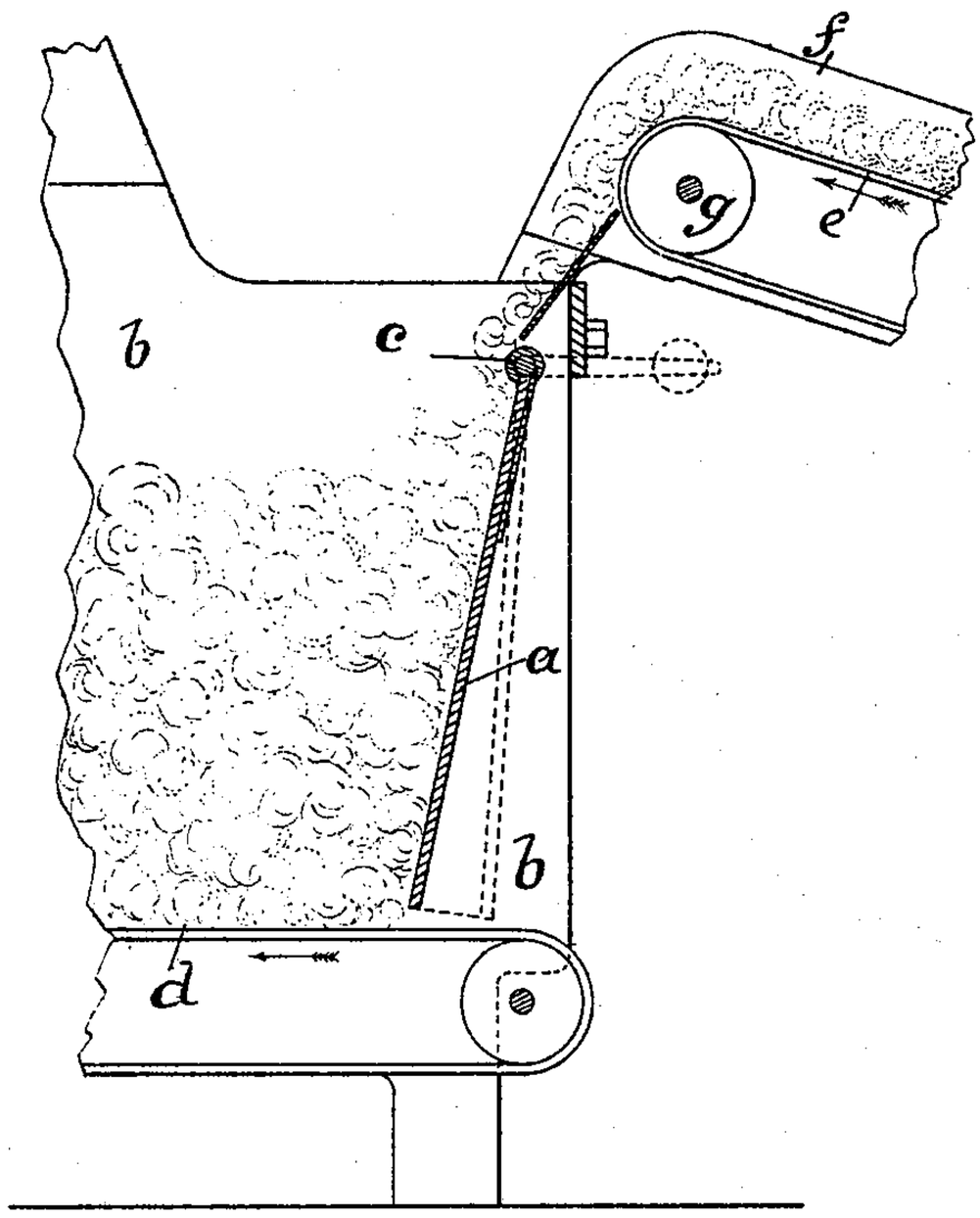
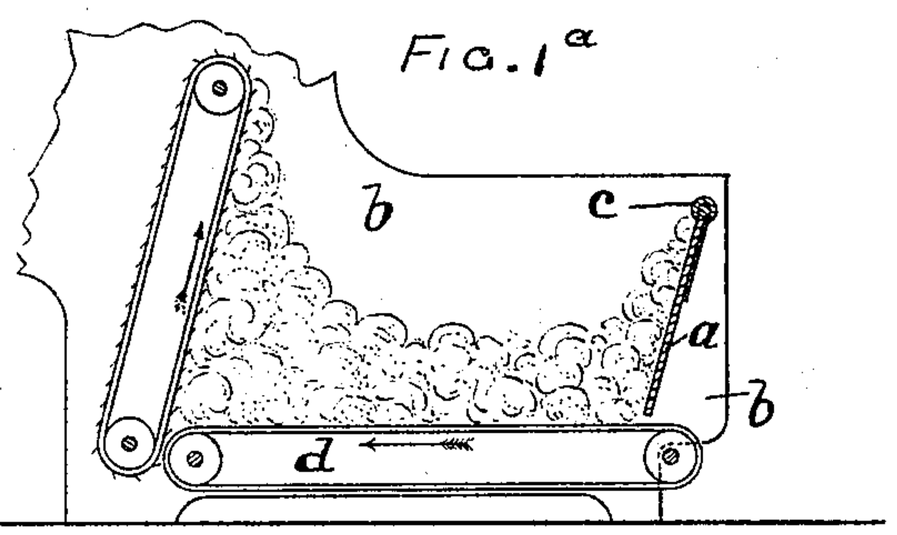


FIG. 1a



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(No Model.) 4 Sheets—Sheet 2.

FIG. 2.

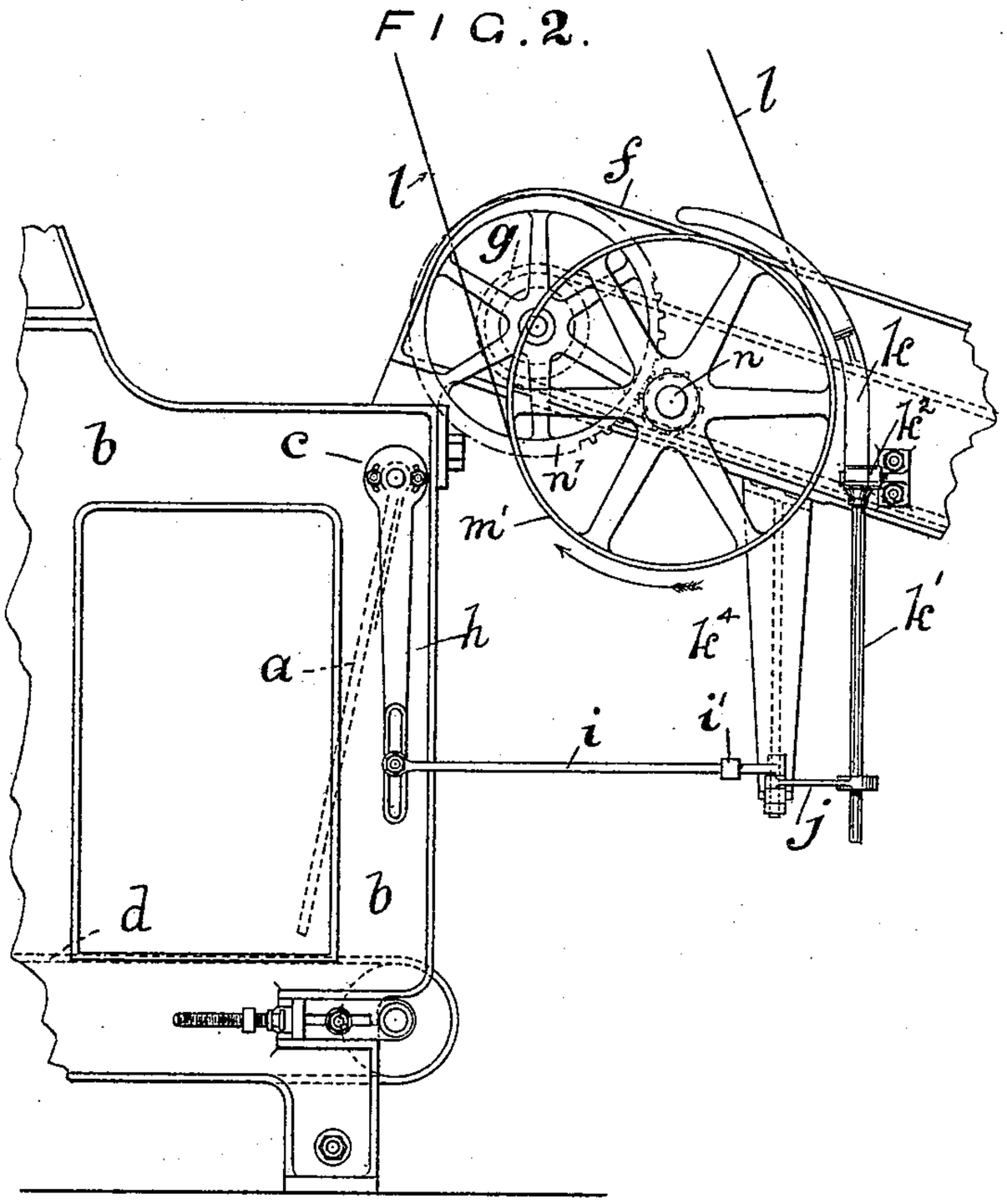


FIG. 3

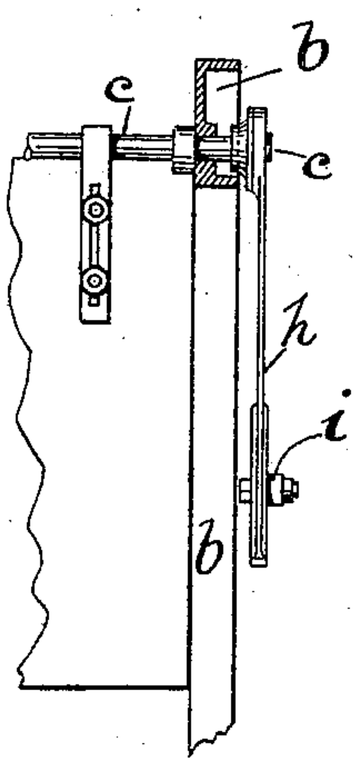
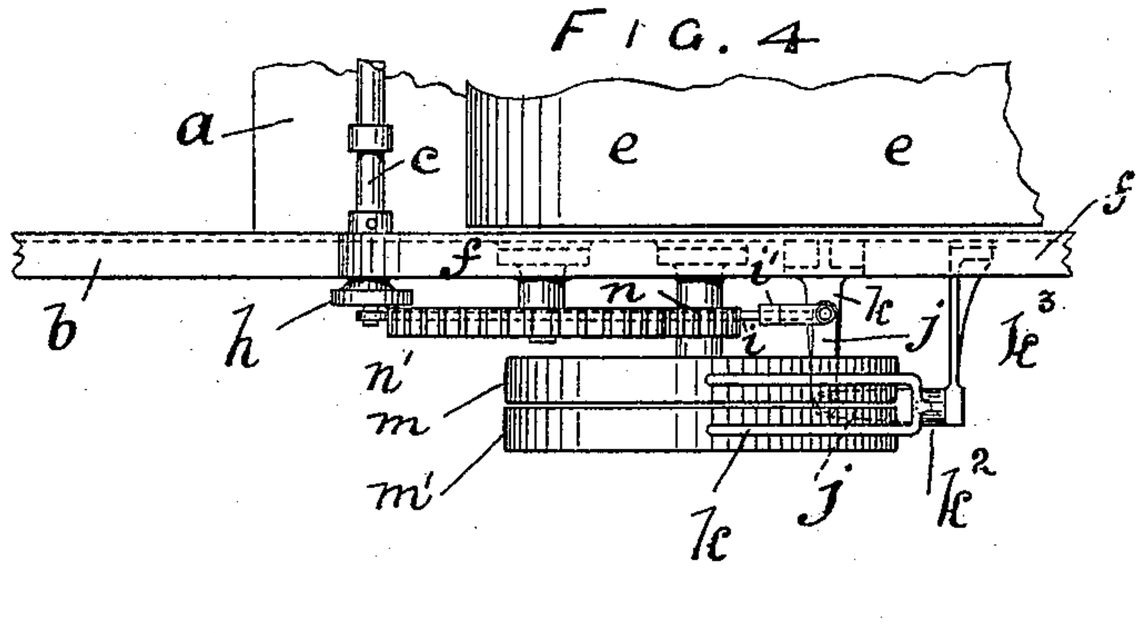


FIG. 4



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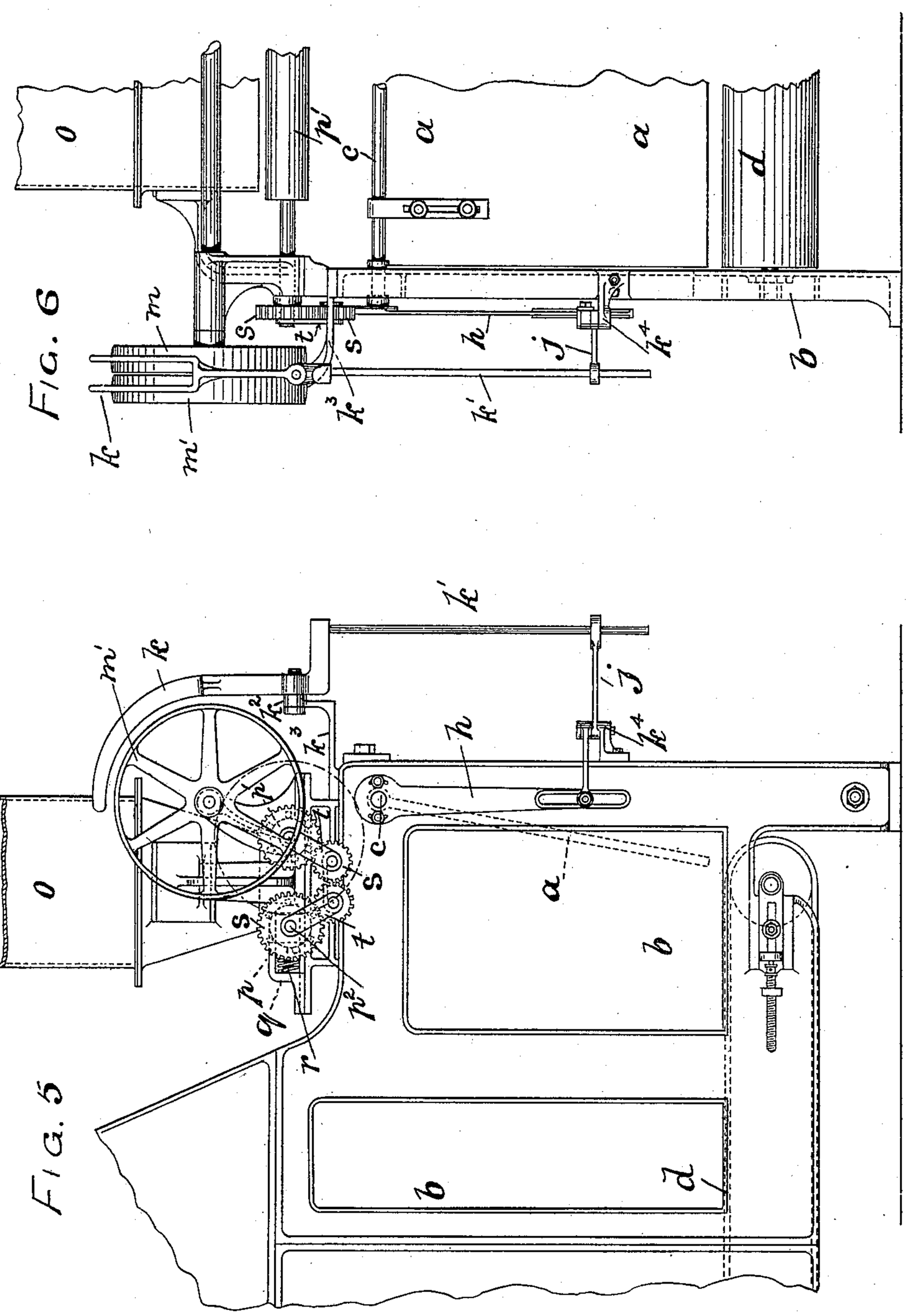
(No Model.) 4 Sheets—Sheet 3.



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(No Model.) 4 Sheets—Sheet 4.

FIG. 8.

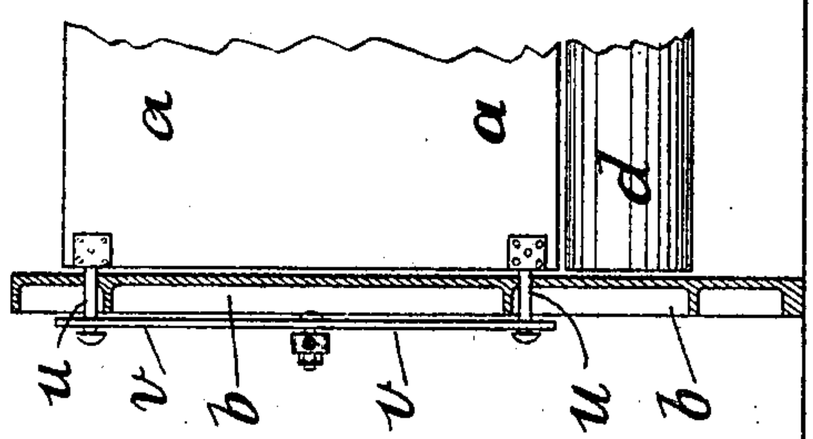
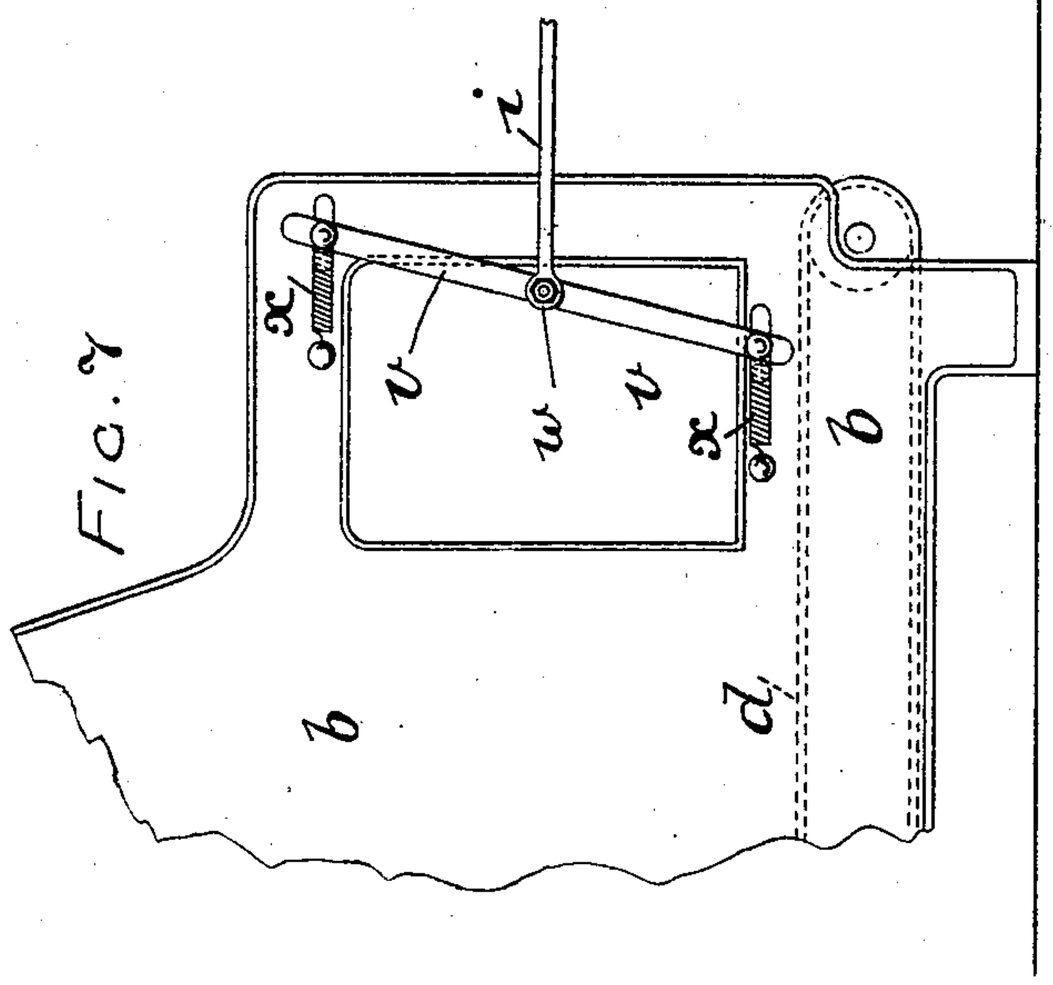


FIG. 7.



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UNITED STATES PATENT OFFICE.

THOMAS RODGERSON MARSDEN, OF OLDHAM, ENGLAND.

MEANS FOR REGULATING FEED OF TEXTILE MATERIALS TO OPENERS.

SPECIFICATION forming part of Letters Patent No. 619,425, dated February 14, 1899.

Application filed September 28, 1897. Serial No. 653,396. (No model.)

To all whom it may concern:

Be it known that I, THOMAS RODGERSON MARSDEN, a subject of the Queen of Great Britain, residing at Oldham, Lancaster county, England, have invented certain new and useful improvements in means for regulating and controlling the feed or supply of textile material to openers, scutchers, carding apparatus, and similar machinery, of which the following is a specification, the invention having been patented in Great Britain, No. 5,697, March 19, 1895.

My invention relates to improved means for regulating and controlling the feed or supply of textile fiber or material to the hoppers or feed-boxes of openers and scutchers, carding apparatus, and the like.

The improvement relates particularly to the feed-hoppers of apparatus of this class, in which a pivoted or suspended board, flap, series of fingers, float, or other object or arrangement is used to regulate the supply to the spiked sheet or other portion of the apparatus. Under my present improvement I propose to do away with the said auxiliary suspended or pivoted or otherwise-arranged boards, fingers, or other parts, and I pivot or loosely suspend or loosely mount the usual fixed front of the hopper, so that it will swing, move, or slide to and fro in obedience to the varying pressure or weight of cotton in the hopper. I connect the said loose hopper-front to the feeding means, whatever such feeding means may be. Thus if the hopper is fed by a traveling lattice I control the movements or speed of the feed-lattice from this moving hopper end. If the hopper is fed from a trunk or chute, I might in a similar manner control the feeding-rollers, or if no such rollers are used I might by the mere movement of the loose hopper end enlarge or diminish the opening through which the fibrous material is passed out of the trunk or into the hopper. In this latter case I might dispense with the connecting rods and levers necessary to control the lattice or trunk feed-rollers and by inclined or curved guides close or open the orifice through which the feed passes to the hopper. The mere mechanism for stopping or altering the speed of the lattice creeper or trunk feed-rollers or enlarging or diminishing or opening and closing the feed-orifice in the trunk or hopper, so as to govern the supply automatically in accordance with the demands of the machine, may be varied greatly in practice, the gist of my invention being the loose hopper end, operating to regulate the feed in the manner described. The same means might be used to control either the direct or the indirect feed to the hopper. For example, the improvement might be utilized to regulate the delivery of material from an auxiliary feed-hopper placed in front of or beside the usual hopper.

To render my invention fully understood, I have attached hereunto three sheets of illustrative drawings, to which I will refer in the course of the following detailed description.

On Sheet 1, Figure 1 is a sectional view of the front or feed end of the hopper of an ordinary opening-machine furnished with my improved movable front or regulating board *a*. On Sheet 2, Fig. 2 is a side elevation of the front end of the hopper, in which I illustrate the means for driving the lattice-feed and also the connections whereby the movement of the lattice-feed is regulated from the said regulating-board. Fig. 3 is an elevation of one end of the said loose front or regulating board *a*, looking from the spiked-sheet end of the hopper. Fig. 4 is a plan view of the same and of the regulating-front which appears in Fig. 3, together with the driving pulleys and gear which operate and regulate the lattice-feed. On Sheet 3, Fig. 5 is a side elevation of a hopper fitted with my improved loose front or regulating board connected to means for regulating the feeding-rollers of a trunk or chute or auxiliary feed-hopper. Fig. 6 is an end elevation of one side of the hopper and mechanism shown in side elevation in Fig. 5. On Sheet 4, Fig. 7 is a side elevation of a hopper in which the loose board, instead of being pivoted, is arranged to move or slide to and fro. Fig. 8 is an end view of the side of the hopper appearing in Fig. 7.

Referring in the first place to the figures on Sheets 1 and 2 of the drawings, the sides of the hopper are marked *b* and the moving floor-lattice *d*. As already said, hitherto the regulating means—such as prongs, shutters, and the like—have been situated in the hopper-space so as to be interposed more or less in the path of the moving fiber and acted

upon by the mass of fiber as it is advanced toward the spiked sheet. Under my present invention I dispense with such regulating means interposed in the hopper.

The front *a* is made loose, as indicated in Fig. 1, so that it will act as a regulating-board and move or recede if an excessive weight of cotton should be fed into the hopper and again resume its normal position when the weight has been relieved. These movements of the regulating-board are utilized to stop and start the feeding mechanism. The method of mounting or placing this board *in situ* may vary without departing from the spirit of my invention; but a convenient and obvious method is to suspend the board *a* from the pivot-shaft *c*, as shown in Sheet 1, the said pivot-shaft being supported in bearings on the sides *b* of the hopper. The regulating-front *a* is so balanced or hung that its normal position or angle is, for example, about as shown in Figs. 1 and 2.

The regulator *a* might be kept in this normal position by the mere weight of its connected parts or by a counterbalance-weight on a lever on the end of the pivot-shaft *c*—for example, as illustrated in dotted lines in Fig. 1—or by a spring or springs. However arranged, the board *a* is so hung that any increase of weight or pressure upon it caused by excessive feed or by the packing of the cotton in the hopper tends to move it toward the position indicated in dotted lines in Fig. 1. By any such movement of the board *a* the pivot-shaft *c* is correspondingly turned, and from this pivot-shaft may be derived the motions which control the feeding mechanism, whatever such mechanism may be. In the hopper represented on Sheets 1 and 2 the feeding of the fibrous material is effected by a very common and well-known means—viz., the lattice-feed. The feeding-lattice *e* runs between sides *f* and is carried on disks *g*, one of which appears in Fig. 1. This lattice *e* may extend to the mixing-room or to a suitable point at which the cotton may be manually laid or mechanically fed upon or thereto. In this case I therefore utilize the movements of the regulating-board *a* and pivot-shaft *c* to stop and start the lattice *e* automatically in accordance with the demands of the hopper *b*. This is effected by fixing on one end of the pivot-shaft *c* where it projects outside of the hopper a lever *h*, which lever is connected by a rod *i* with one arm of a bell-crank lever *j*, pivoted on a bracket k^4, bolted to the bottom of the feed-lattice casing *f*. The other arm of the bell-crank lever *j* engages with a tail *k'* from the belt-fork *k*, which is pivoted at k^2 to a bracket k^3, bolted to the side *f* of the lattice-casing, the said fork governing the driving-strap *l*, which runs around the fast and loose pulleys *m m'*. On the boss of the fast pulley *m* or keyed to its shaft is a pinion *n*, which gears with a spur-wheel *n'* on the shaft of the lattice-feed-carrying disks *g*. Thus the feed-lattice *e* is driven so as to carry forward and tumble the cotton or other fiber into the hopper *b*. If too much cotton is fed into the hopper, the increasing weight or pressure upon the board *a* pushes it outward, so as to slightly turn the pivot-shaft *c*, the lever *h* then transmitting the movement through the described parts to the belt-fork *k*, which is thus shifted from the fast pulley *m* to the loose pulley *m'*, with the result that the feeding-lattice *e* is stopped and the supply of cotton to the hopper interrupted. When the creeper or floor-lattice *d* and the spiked sheet have removed the superabundant fiber from the hopper, the weight or pressure upon the board *a* is relieved and it moves inward to its original position, this return being effected either by the weight of the lever *h* and parts or by a counterbalance-weight, as indicated. The return movement of the board *a* shifts the belt-fork *k* from the loose to the fast pulley and the feeding-lattice is thus restarted. In Fig. 4 the belt-fork *k* is represented in the act of being moved across the face of the pulleys *m m'* and appears midway between the two. The exact requisite amount of motion of the belt-fork is adjusted by slotting the lever *h* and securing the pivot-stud of the rod *i* at such a point as will give the requisite amount of motion. The adjusted angle of the regulating-board or the length of the rod *i* may also be altered by means of the screwed union-joint at *i'* between the rod *i* and the head which connects it to the bell-crank lever. I have been at pains to describe the foregoing connection between the regulating-board and the feeding-lattice not because I consider any such description to be essential, but merely for the purpose of helping the reader more easily to appreciate and trace the practical results of my invention.

Fig. 1[a] illustrates the effect of my invention upon the feed of the fiber and shows that the regulating-board is operated entirely by the weight of the fiber resting against the board without any increase of pressure owing to packing of the fiber between the spiked sheet of the board, such as takes place in some former arrangements, while the regulator not being interposed in the path of the feed between the feed and the spiked lattice in no way hampers the feed. In the foregoing and subsequent arrangements I have in all cases shown the front of the hopper loose and forming the regulator-board; but it will be obvious that, if desired, a fixed false front may be added without affecting the operation of the regulating-board. This, however, is quite unnecessary.

In preparing the foregoing figures I selected the lattice-feed as being the feeding mechanism which I have found the most general and useful; but my invention might also be applied to the controlling of the ordinary trunk-feed for example. This would or might be done in the manner shown by Figs. 5 and 6 on Sheet 3, Fig. 5 being a side elevation and Fig. 6 a front elevation of one side of the hop-

per and trunk-feed. In these figures the loose pivoted front *a* again appears precisely as in the foregoing sheet of drawings. The side lever *h*, connecting-rod *i*, bell-crank lever *j*, and belt-fork *k* all appear as in the former instance and working in a precisely similar manner. The trunk or chute through which the cotton is supplied to the hopper *b* is marked *o*, and the two feed-rollers which pass the cotton into the hopper are marked *p p'*. One of these feed-rollers, *p*, is carried in sliding bearings *q* on a shaft p^2, and springs *r* behind the bearings *q* tend to push the movable roller *p* toward the fixed roller *p'*. Thus the space between the rollers alters according to the passage of cotton. The feed-rollers *p p'* are driven from the fast and loose pulleys *m m'* by gearing *s* with loose bridle-link connections *t*, so as to keep the gearing engaged even when the roller *p* slides. All this trunk-roller and driving arrangement is, however, old and well known and is no part of my invention. I merely indicate it to show how my regulator *a* can be connected to this species of feeding mechanism. The movements of the loose front under the varying weight or pressure of cotton in the hopper correspondingly move the belt-fork *k*, so as to stop and start the feed-rollers *p p'* of the trunk or chute *o* in accordance with the demands of the hopper *b*, precisely as already set forth with reference to the figures on Sheets 1 and 2.

Although the suspending of the board *a* from a pivot-shaft or from pivots, as described, is no doubt the most obvious and easy way of mounting the said board, it is evident that other methods of mounting it might be adopted. For example, as shown in Figs. 7 and 8 on Sheet 4, the board or front *a*, instead of being pivoted, might be mounted to slide to and fro. In this case the front *a* is carried on top or bottom studs or slides *u* secured to the front and projecting through longitudinal slots in the sides *b* of the hopper. These studs or slides *u* carry a side bar *v*, upon which is a stud *w*, and on this stud *w* I may pivot a rod *i* similar to the connecting-rod *i* shown in the other figures, whereby the bar *v*, and therefore the movable board *a*, is connected with the knocking-off mechanism. When the feed or delivery of cotton or other fiber into the hopper *b* exceeds requirements, the front *a* yields to the weight or pressure and moves outward the studs or slides *u*, sliding in the slots and carrying with them the side bar *v*, whereby communication is established with the knocking-off apparatus and the feed is stopped.

The springs *x*, or it might be a weight or weights, bring back the regulating-board when the excess of material in the hopper has been removed, and this return of the board again sets the feed mechanism in motion.

For instance, my invention might be utilized to regulate the delivery of material from an auxiliary feed-hopper placed in front of or adjacent to the usual hopper, or I might from the movements of the loose front control the motion of a lattice-feeder in a separate or upper room—for example, in the mixing-room above—the said lattice-feeder discharging into a chute leading to the hopper proper. This might be done by utilizing the motion from the fast and loose pulley shaft by pinion-and-spur gearing and imparting the said motion to a band or rope pulley, from which a band or rope extends to the driving-pulley on the shaft carrying the disks of the lattice-feeder in the room above.

It will be evident that by arranging the regulating-board in the manner hereinbefore described I am enabled greatly to simplify the apparatus. Moreover, the fibrous material after falling over the regulating-board is free to be carried on by the creeper without impediment toward the spiked lattice, at the same time there is no tendency to pack it up against the lattice, the regulating-board being sloped so as to take the weight of the feed without any such packing action, and nothing is interposed between the feed and the spiked lattice which tends in any way to check the flow or to become choked, whereby it differs from former apparatus, in which the regulating parts in the hopper-space were apt to check the free passage of the fibrous material and tended to interfere with the working of the apparatus to the best advantage, all of which drawbacks are obviated under my invention.

I claim—

In combination, the hopper, a feed-lattice leading to the hopper for supplying the same, the driving means for the lattice comprising the belt, the fast and loose pulley, and the shifting fork, a feed-board forming a part of the wall of the hopper itself, a shaft therefor and connections from the shaft of the feed-board to the shifting fork, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

THOMAS RODGERSON MARSDEN.

Witnesses:
JOSHUA ENTWISLE,
RICHARD IBBERSON.