(No Model.) 5 Sheets—Sheet 1.

A. H. MORTON.

FIBER FEEDING MACHINE.

No. 518,419. Patented Apr. 17, 1894.

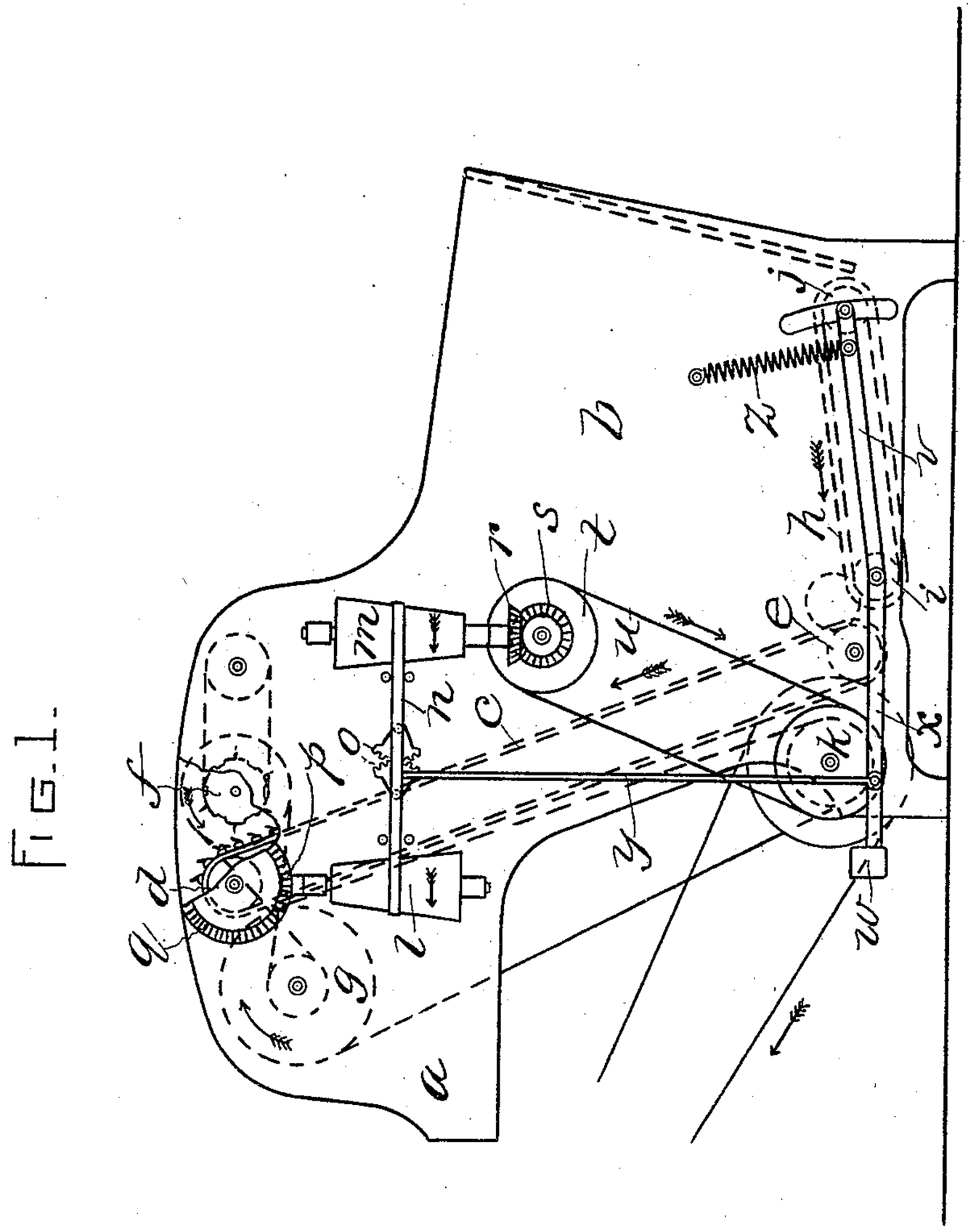

FIG. 1.

WITNESSES:

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(No Model.) 5 Sheets—Sheet 2.

A. H. MORTON.

FIBER FEEDING MACHINE.

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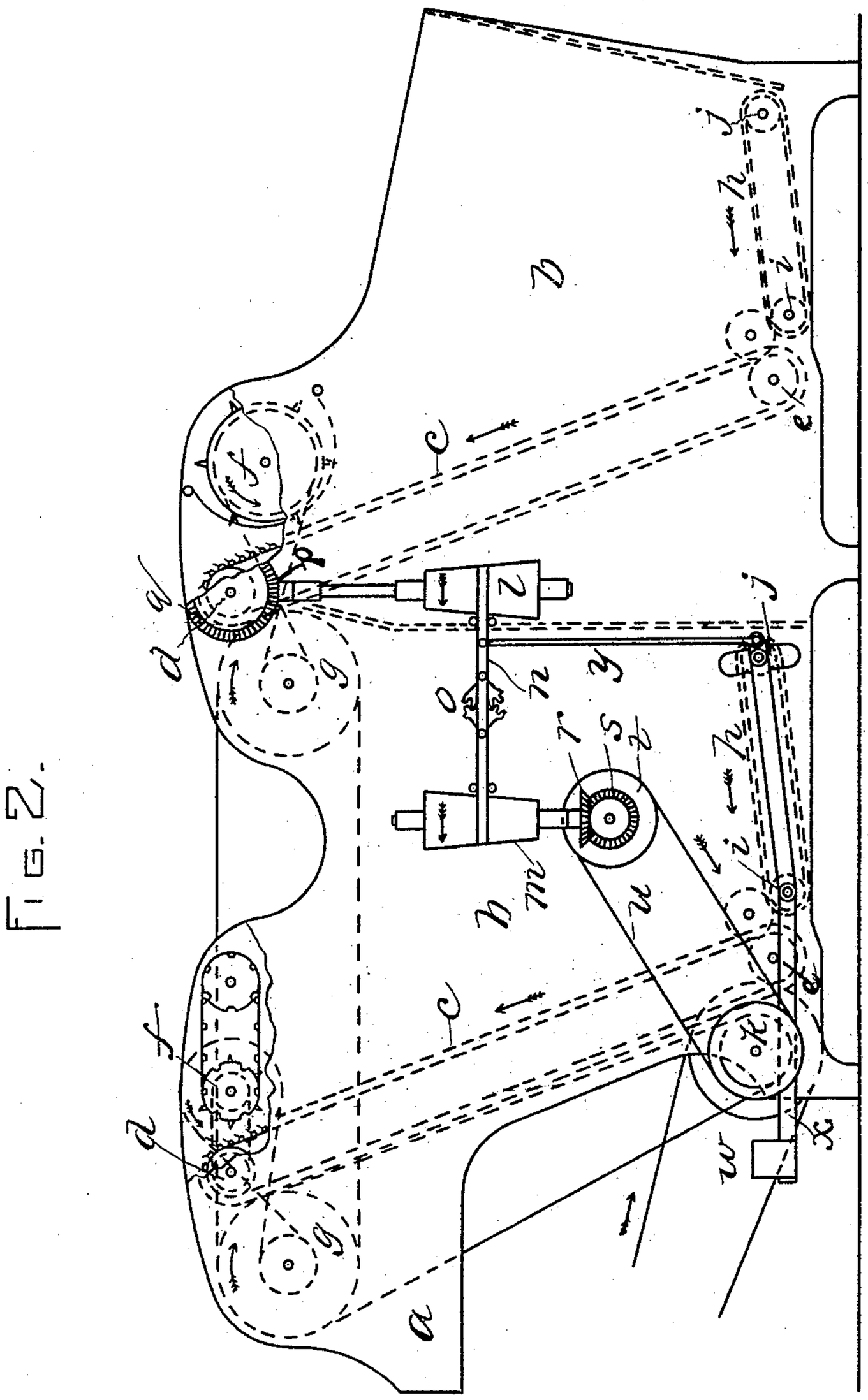

FIG. 2.

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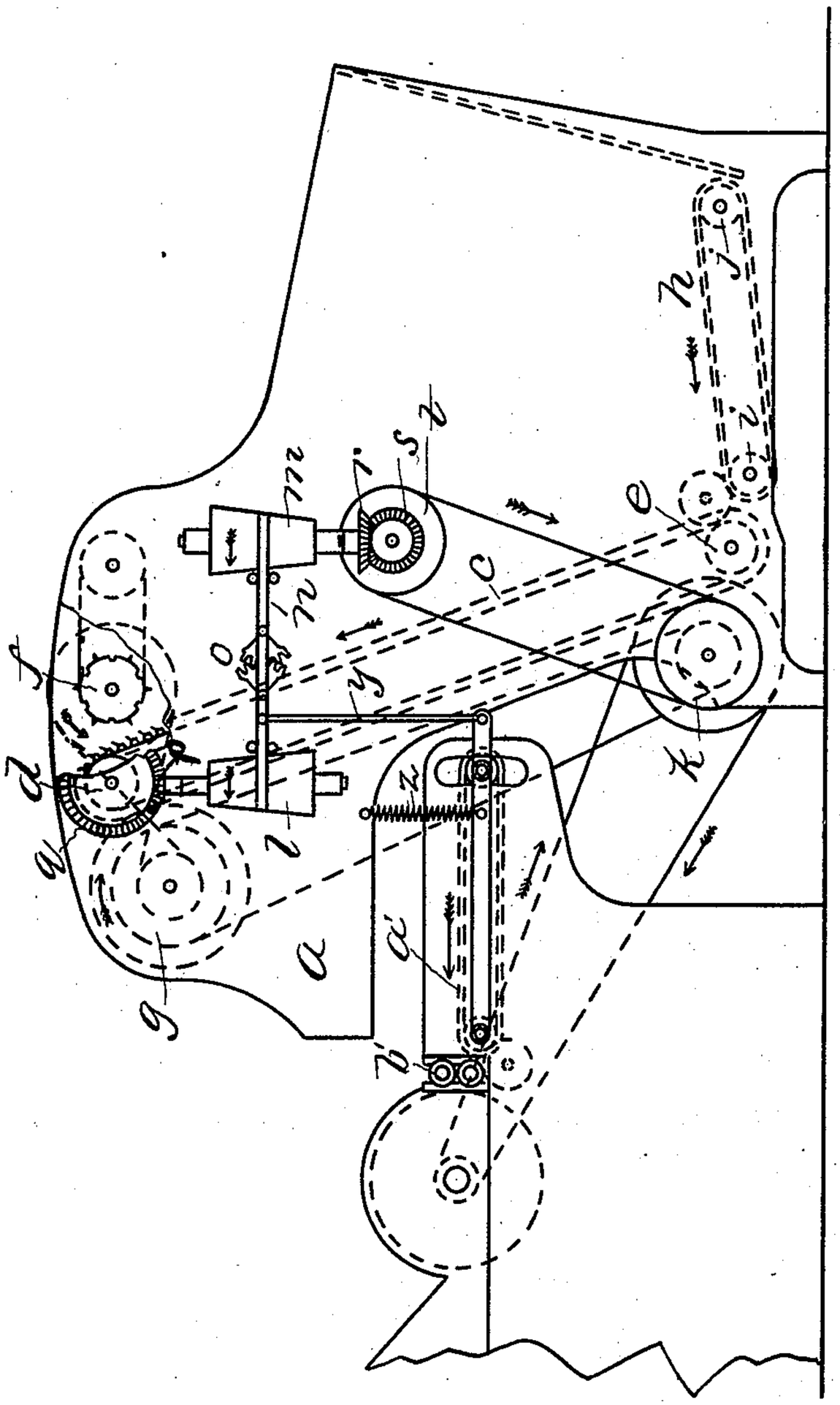
(No Model.) 5 Sheets—Sheet 3.

A. H. MORTON.

FIBER FEEDING MACHINE.

No. 518,419. Patented Apr. 17, 1894.

FIG. 3.



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(No Model.) 5 Sheets—Sheet 4.

A. H. MORTON.

FIBER FEEDING MACHINE.

No. 518,419. Patented Apr. 17, 1894.

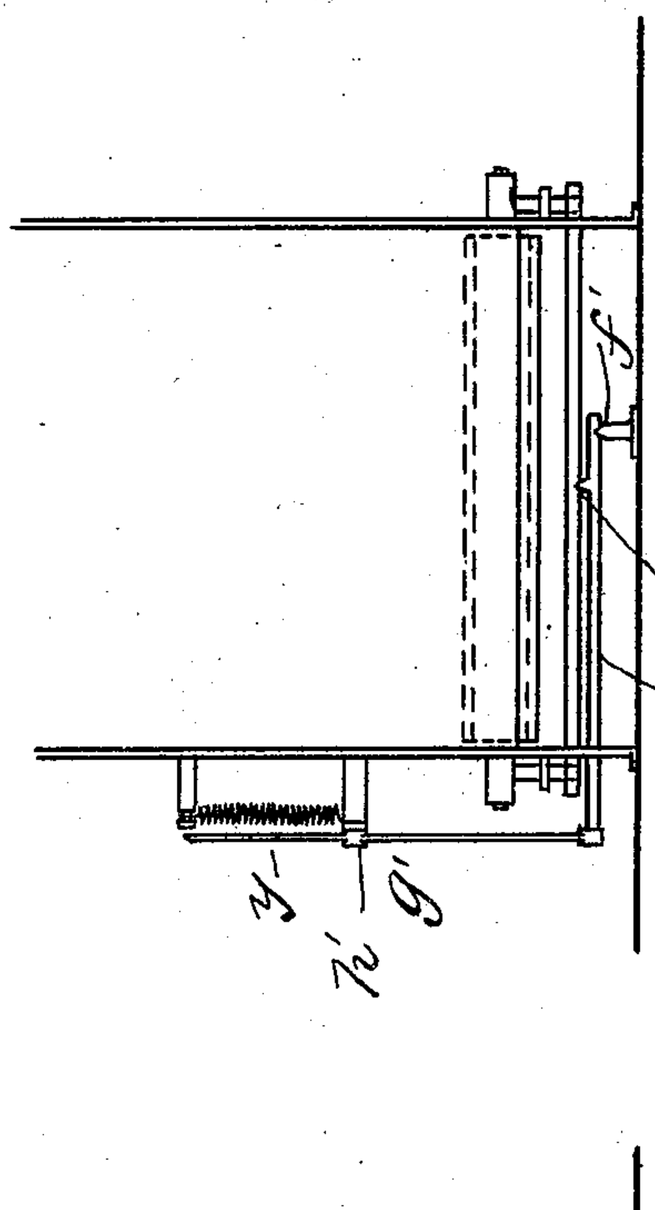
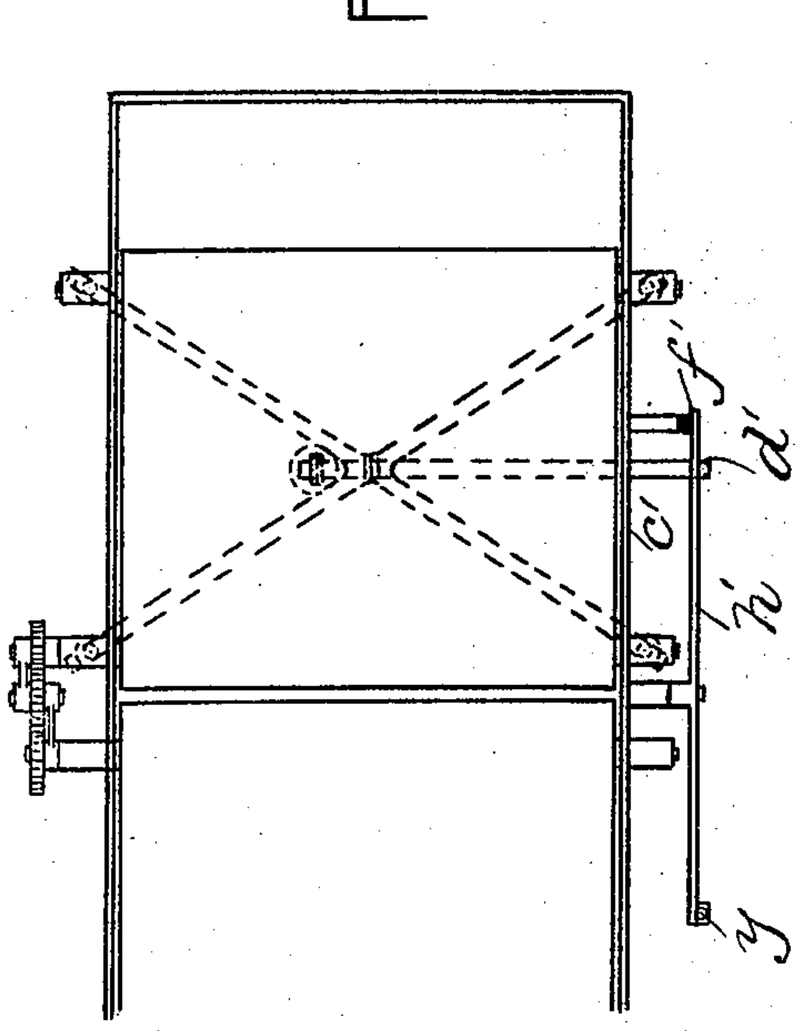


FIG. 6.

FIG. 4.



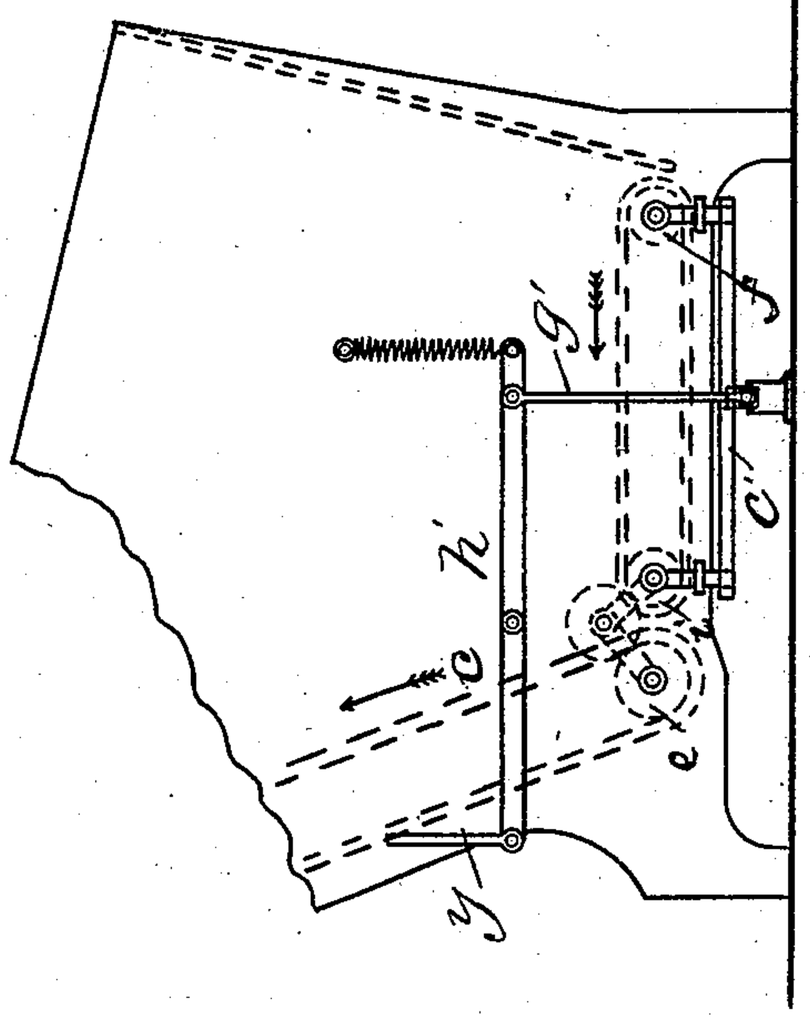


FIG. 5.

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(No Model.) 5 Sheets—Sheet 5.

A. H. MORTON.

FIBER FEEDING MACHINE.

No. 518,419. Patented Apr. 17, 1894.

FIG. 7.

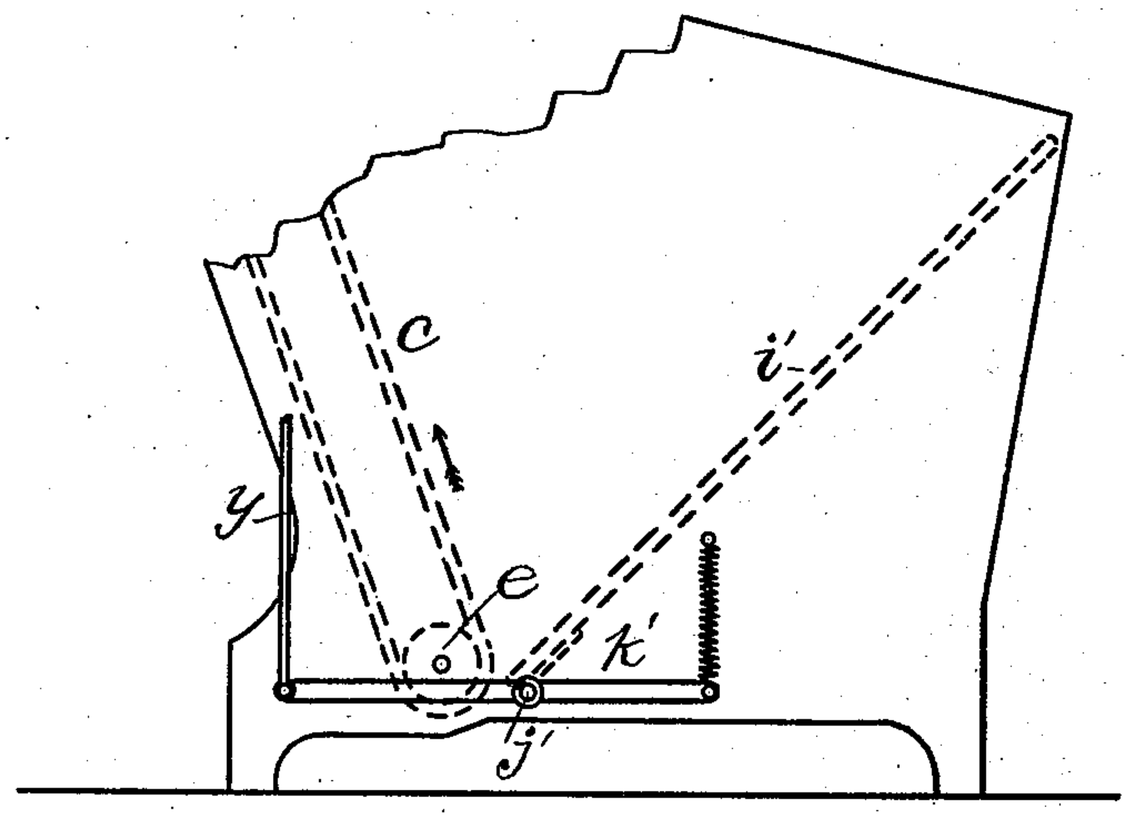
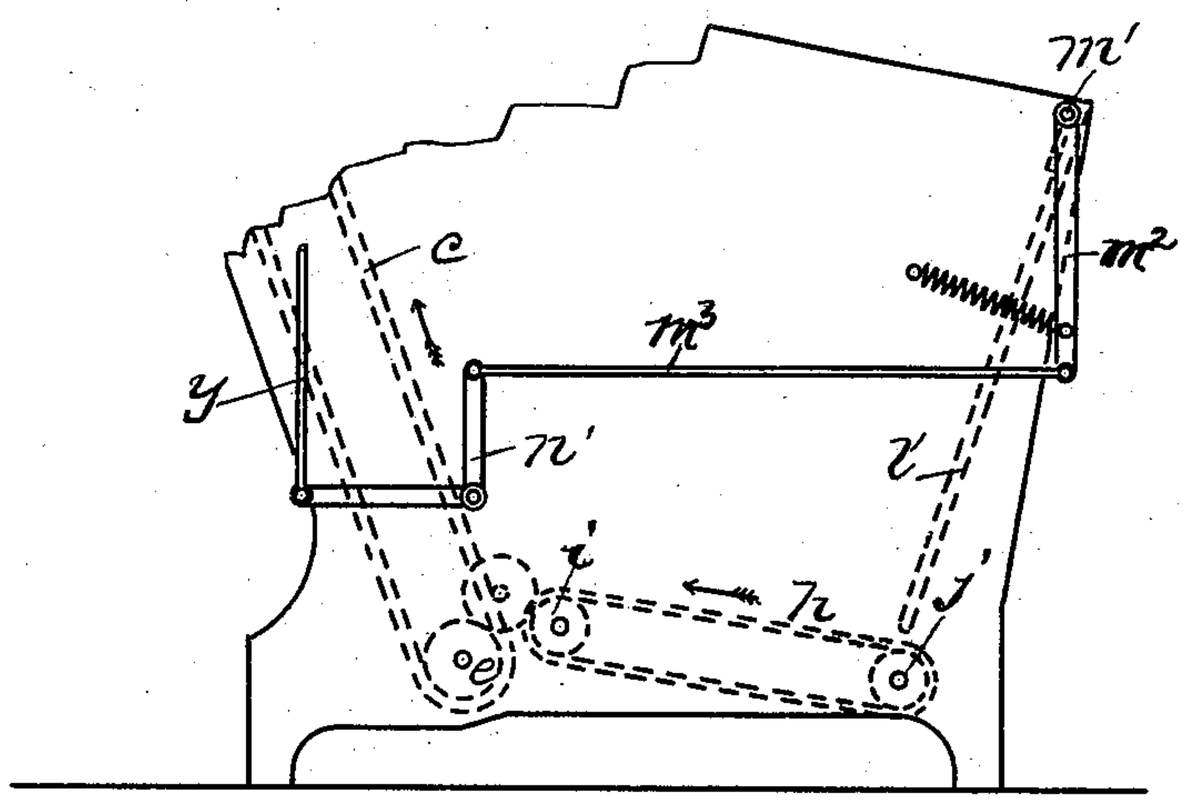


FIG. 8.



WITNESSES:
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ATTORNEYS.

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UNITED STATES PATENT OFFICE.

ALBERT HAYES MORTON, OF LOWELL, MASSACHUSETTS, ASSIGNOR TO THE KITSON MACHINE COMPANY, OF SAME PLACE.

FIBER-FEEDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 518,419, dated April 17, 1894.

Application filed November 7, 1893. Serial No. 490,296. (No model.)

To all whom it may concern:

Be it known that I, ALBERT HAYES MORTON, of Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Fiber-Feeding Machines, of which the following is a specification.

This invention has relation to fiber-feeding machines, and it has for its object the provision of such improvements as will secure the supply of the material in unvarying quantity from the feeding machine to the machine or machines in which it is to be treated.

One of the chief difficulties in the way of effecting an even feed in machines of the kind mentioned has resided in the fact that as the amount of stock in the hopper varied, with a consequent variation in the degree of pressure of the same against the lifting or spike apron, the amount of material engaged and carried up by the latter varied accordingly. In other words, when the hopper was full the pressure of the stock against the lifting apron would be greatest and the latter would engage and carry up the greatest amount of material, and as the amount of stock in the hopper decreased, and the pressure against the lifting apron was diminished the said apron would engage and carry up a correspondingly less amount of material.

By the present invention the difficulty mentioned is overcome, the said invention consisting in so utilizing the amount of stock in the hopper as to regulate the rate of speed at which the lifting apron is driven, the means provided for carrying out the invention comprising a yielding support for the material, which support may be either vertical, inclined, or lateral, a speed-changing mechanism which controls the speed of the lifting-apron and connections between the same and said speed-changing mechanism, so that as the weight or pressure of the material on the support varies the speed of the lifting apron may be varied. Either the quantity of the material delivered to or by the machine may be utilized in carrying out my invention.

Reference is to be had to the annexed drawings and to the letters marked thereon forming a part of this specification, the same letters designating the same parts or features as the case may be, wherever they occur.

Of the drawings—Figure 1 is a side elevation of a one-section fiber-feeding machine provided with my improvements a part of the frame being represented as broken away. Fig. 2 is a similar side elevation of a two section machine, the improvements being shown as applied so as to regulate the speed of the lifting apron of the first section according to the amount of stock on the feed apron of the second section. Fig. 3 is a similar view of a one-section machine showing the manner of applying the improvements so as to regulate the speed of the lifting apron by the amount of stock on the feed apron of a lapping or similar machine. Figs. 4, 5 and 6 are diagrams showing, respectively, in plan and side and rear elevation, a modified vertical yielding support for the material. Figs. 7 and 8 are diagrams showing different forms of lateral supports which may be employed in my invention.

In the drawings *a* designates the frame of the machine.

b is the hopper or supply box to receive the stock.

c is the lifting or spike apron which is supported on and travels around the parallel rolls *d e*.

f designates the rotary comb or knock-off, which removes the surplus stock from the lifting apron. Any suitable form of means may, however, be employed for this purpose.

g designates the doffer which removes the stock delivered by the lifting apron.

h designates the feed apron which travels around the parallel rolls *i j*.

The lifting apron is operated by the roll *d* which is driven from the driving band pulley *k* through the medium of suitable speed-changing mechanism, said speed-changing mechanism consisting in the present case of two reversed cones *l m*, connected by a belt *n* which is adapted to be shifted on the cones by belt-shipping levers *o* of ordinary construction. The driven cone *l* has its shaft provided with a bevel pinion *p* which engages and drives a bevel gear *q* on the shaft of the upper lifting-apron roll *d*. The driving cone *m*

has a bevel gear *r* on its shaft which is engaged by a like gear *s* connected with a band pulley *t* driven from the band pulley *k* by means of a belt *u*.

As has been stated the chief purpose of this invention is to change or vary the speed of the lifting apron as the amount of stock engaged by the latter varies, and this is accomplished by providing yielding supports for the stock so connected with the speed-changing mechanism as that the latter may be operated by the varying positions of the former one to the weight or pressure thereon of the stock.

In Fig. 1 the feed apron *h* is made to serve as the yielding support for the regulation of the speed of the lifting apron. The rolls *i j* of the said feed apron are journaled in a skeleton lever *v*, fulcrumed at its forward end and counterbalanced by a weight *w* on an arm *x* which arm is connected with the belt shipping levers *o* through the medium of a rod *y*. A spring *z* tends to raise the free end of the lever *v* and consequently the rear end of the apron when there is no weight thereon or the weight thereon is light, according to the adjustment of the spring or counterbalancing weight or both.

In the operation of the invention as thus far described it will be seen that as the box is filled with stock the feed apron forming a yielding support will be depressed, the free end of the arm *x* will be raised, and the shipping levers of the speed-changing mechanism operated to run the lifting apron at a comparatively slow speed. As the material in the hopper becomes exhausted and the lifting apron catches less stock or tends to carry up less stock the free end of the lifting apron will be raised, moving the arm *x* and operating the speed-changing mechanism so as to run the said lifting apron at a higher rate of speed, the speed being increased in accordance with the degree to which the free end of the feed apron is raised, the latter being governed by the weight of the stock thereon, as will be readily understood.

Instead of employing a feed apron as a support for the material, a plain board surface may be used.

In Fig. 2 substantially the same mechanism is employed for operating the speed of the lifting apron of the first section, as has been shown in the description of the construction and operation of parts illustrated in Fig. 1, the only difference in this construction being that the stock carried up by the lifting apron of the first section and delivered to the second section is made to control the speed of the lifting apron, the feed apron in the second section being employed in this illustration as the yielding support by which the speed-changing mechanism is controlled. In this instance the lever *y* connects directly between the yielding support and the belt-shifter instead of through the medium of a weighted lever, as in Fig. 1. If an unduly great amount of stock is delivered to the second section, the feed apron will be depressed and the speed of the lifting apron "slowed down." If there is a tendency to deliver less stock than is required for the second section, the reverse operation of the feeding apron will take place and the lifting apron will be "speeded up."

In Fig. 3 substantially the same construction and mode of operation are illustrated as in Fig. 2, the only difference being that instead of the stock being delivered to a second section, it is delivered upon the feed apron *a'* of a lapper or other similar machine, which feed apron delivers the stock to the feed rolls *b'*.

In all instances thus far cited the feed apron, which is made to constitute a yielding support, is pivoted at one end and allowed to be tipped up at the other. This construction is not however, essential, nor in most cases desirable, since the feed apron and its rolls may be supported in a frame *c'* which may be constructed as a scale platform and supported upon levers having scale or knife edge bearings, as shown in Figs. 4, 5 and 6, so that said feeding apron or yielding support (for it is understood that instead of a feed apron it may as well be a fixed surface), may be lowered and raised bodily.

It will be noted that in the modifications at present being described, the frame *c'* is supported upon a knife edge *d'* of a lever *e'*, the latter being at its its inner end supported upon a knife edge *f'*. The outer end of the lever *e'* is connected by means of a rod *g'* with an arm or lever *h'* extending to the arm *x* hereinbefore described.

In Fig. 7 the yielding support *i'* is shown as inclined when in normal position and fulcrumed on a rod *j'* near the lower roll of the lifting apron. The fulcrum rod *j'* is connected to an arm or lever *k'* similar to arm *x* and said arm *k'* is adapted to be connected with the speed-changing mechanism so that as the position of the support *i'* varies by the varying weight or pressure of the stock thereon the speed of the lifting apron will be changed accordingly.

In Fig. 8 the yielding support *l'* is shown to be laterally arranged when in normal position, and to be fulcrumed at its upper edge on a rod *m'*, which rod is connected through an arm or lever m^2 and a link rod m^3 with a bell-crank-lever *n'* similar in function to arm *x* and hence adapted to actuate the speed-changing mechanism in a similar manner.

It is to be noted that while the invention of necessity has a yielding support upon which the material may operate by gravity or pressure the character of such support and the manner of its arrangement in the machine are not essential, nor is the location of the yielding support essential to the invention excepting that it shall be so that the stock being fed as

described may act thereon by gravity or pressure in order to act on the speed-changing mechanism for the purpose described.

Having thus explained the nature of the invention and described a way of constructing and using the same, though without attempting to set forth all of the forms in which it may be made or all of the modes of its use, it is declared that what is claimed is—

1. The combination of a yielding support for the material, a lifting-apron, means for operating the same a speed-changing mechanism for controlling the speed at which the lifting-apron is driven, and mechanism intermediate of the yielding support and speed-changing mechanism and connecting the same, whereby as the weight or pressure of the material on the yielding support varies, the speed at which the lifting-apron is run may be varied as required.

2. The combination of a yielding support for the material, a lifting-apron, means for operating the same a speed-changing mechanism for controlling the speed of the lifting-apron, and levers and rods intermediate of the yielding support and the speed-changing mechanism and connecting the same, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 25th day of October, A. D. 1893.

ALBERT HAYES MORTON.

Witnesses:

ARTHUR W. CROSSLEY,

A. D. HARRISON.