

No. 626,675.

Patented June 13, 1899.

L. C. CROWELL.  
FEEDING MECHANISM.

(Application filed June 2, 1898.)

3 Sheets—Sheet 1.

(No Model.)

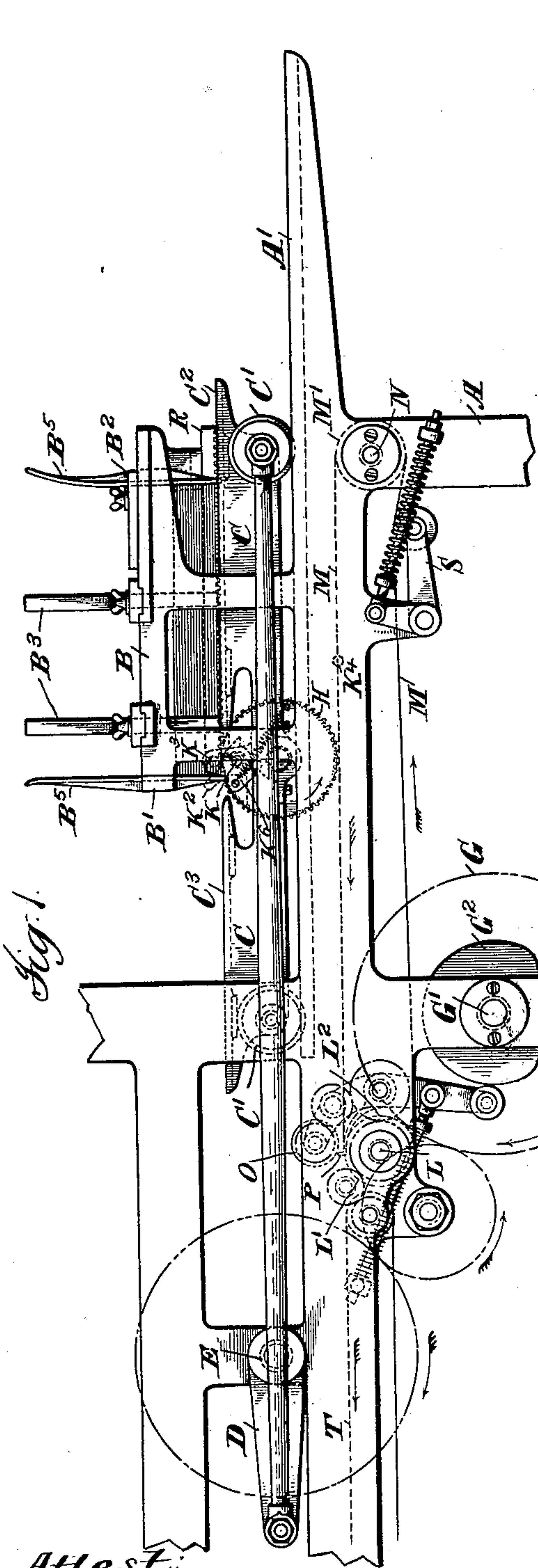


Fig. 1.

Attest:  
J. P. Kellogg,  
Inventor

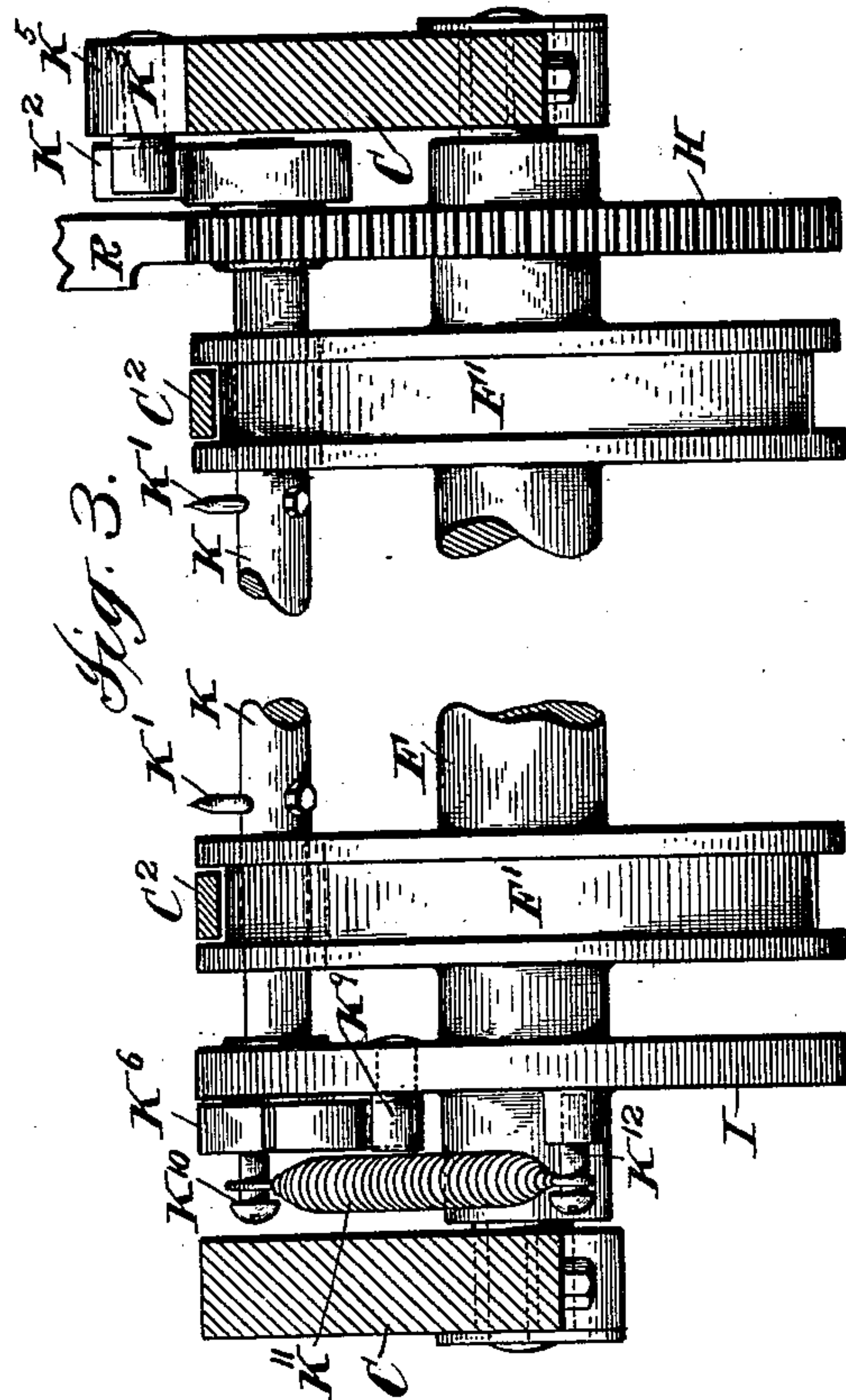


Fig. 3.

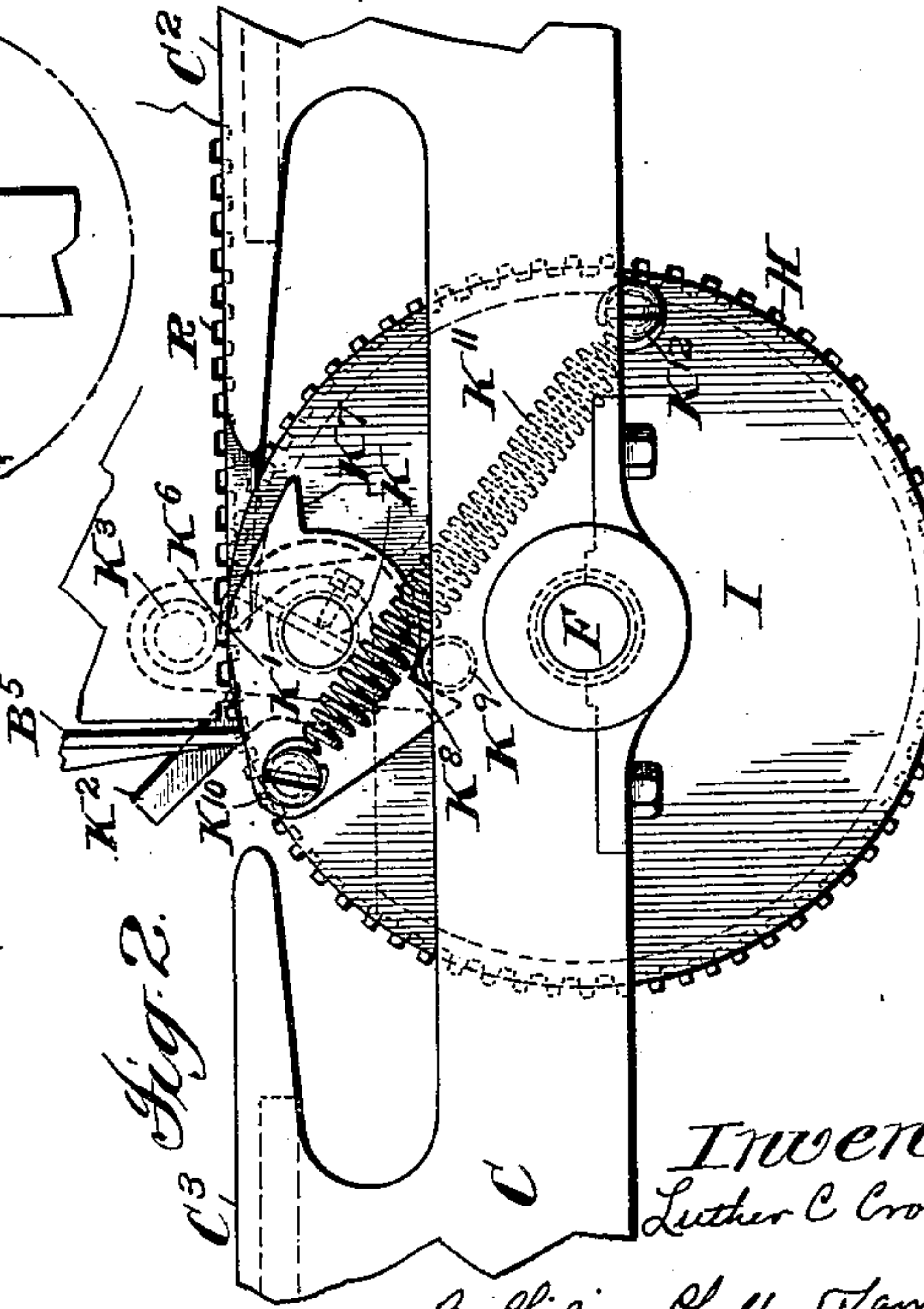


Fig. 2.

Inventor  
Luther C. Crowell  
By Philip Phelps Sawyer  
Attys

No. 626,675.

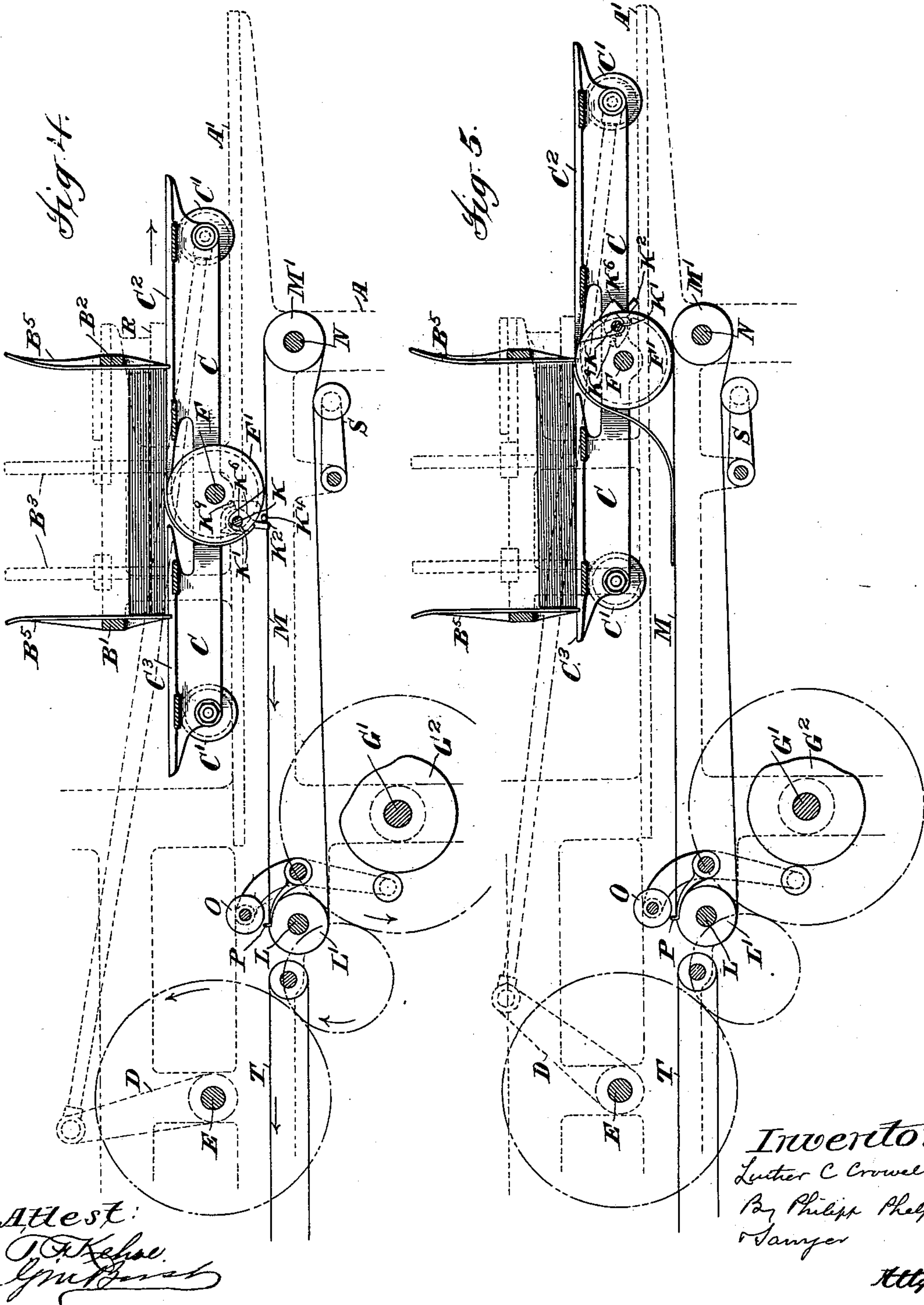
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(No Model.)

3 Sheets—Sheet 2.





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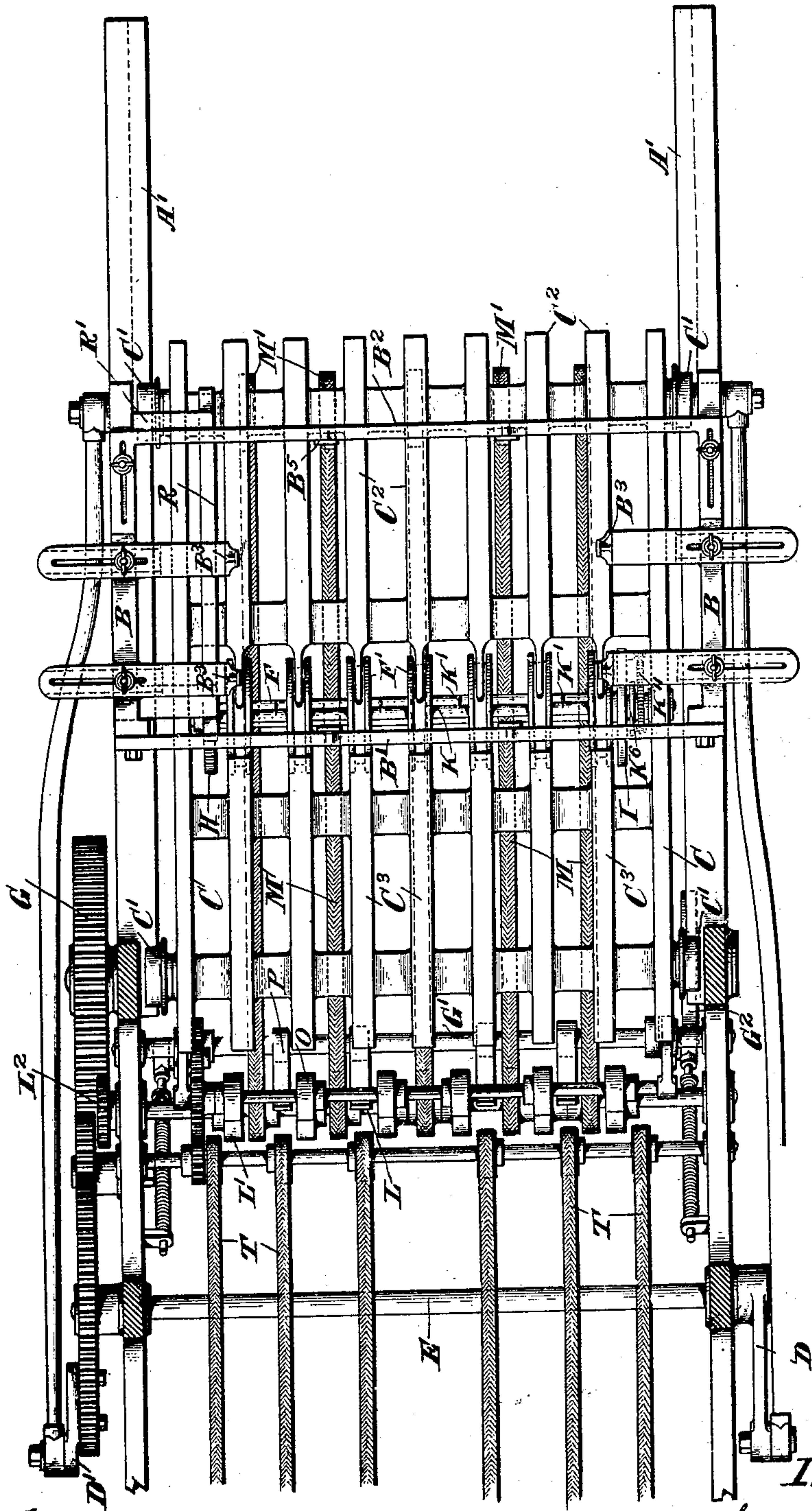
L. C. CROWELL.  
FEEDING MECHANISM.

(Application filed June 2, 1898.)

3 Sheets—Sheet 3.

(No Model.)

Fig. 6.



Attest:  
T. F. Kehoe.  
G. M. Bush

Inventor  
Luther C. Crowell  
By Philip Phelps Sawyer  
Attys



# UNITED STATES PATENT OFFICE.

LUTHER C. CROWELL, OF NEW YORK, N. Y., ASSIGNOR TO ROBERT HOE,  
THEODORE H. MEAD, AND CHARLES W. CARPENTER, OF SAME PLACE.

## FEEDING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 626,675, dated June 13, 1899.

Application filed June 2, 1898. Serial No. 682,319. (No model.)

*To all whom it may concern:*

Be it known that I, LUTHER C. CROWELL, a citizen of the United States, residing at New York, county of Kings, and State of New York, have invented certain new and useful Improvements in Feeding Mechanism, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

10 This invention relates to an improvement in feeding mechanisms.

In feeding papers, pamphlets, magazines, sheets, and other similar articles to wrapping-machines it is desirable to insure the perfect  
15 action of the wrapping devices that the articles to be wrapped be automatically fed thereto and fed with rapidity and precision. The feeding devices must operate rapidly in order that the wrapping machinery may not be limited in its output. They must also act to  
20 feed the articles singly and in proper time, as a failure to feed or to feed properly or to feed more than one article interferes with the action and disarranges the operation of the wrapping machinery. It is also very desirable that the wrapping-machines be fed from a pile or stack which can be readily renewed or replenished from time to time without  
25 stopping either the feeding or the wrapping machinery or in any way interfering with its operation. It is apparent that when the articles to be thus fed are taken from the bottom of a pile or stack the supply can be more readily renewed and with much less interference with the operation of the mechanism  
35 than when the feeding is from the top of the pile or stack, as feeding from the top of a pile or stack usually requires somewhat-complicated pile-raising mechanisms. When, however, the feeding is from the bottom, much greater difficulty is experienced in detaching single articles or papers, since from the weight of the pile and other causes the liability of two or more articles to adhere is  
45 greatly increased.

It is the object of this invention to produce a feeding mechanism which shall be simple and therefore economical to construct and maintain, which may, if desired, be used to  
50 feed from the bottom of the pile or stack of

papers or articles to be fed, so that the same may be replenished whenever desired without stopping the action of either the feeding machinery or the wrapping machinery and which shall be certain in its operation, so that  
55 only a single paper or article shall be taken from the pile at a time and properly fed to the machine.

With these and other objects in view the invention consists in certain constructions, parts, improvements, and combinations, as  
60 will be hereinafter described, and fully pointed out in the claims hereunto appended.

In the accompanying drawings, which form a part of this specification and in which like  
65 reference characters indicate the same parts, Figure 1 is a side view of the feeding mechanism, parts of the frame being broken away. Figs. 2 and 3 are detail views. Figs. 4 and 5  
70 are diagrammatic views of the feeding mechanism, showing the parts in two positions. Fig. 6 is a plan view.

In the machine shown in the accompanying drawings, which represent a preferred embodiment of my invention, A indicates the  
75 frame, which is formed to provide suitable ways A'. Rising from the frame A are suitable standards B, connected by cross-bars B' B<sup>2</sup>. The cross-bar B<sup>2</sup> is adjustable on the standards B by means of slots and set-screws  
80 in an obvious manner. Mounted on the standards B are supports B<sup>3</sup>, these supports being also adjustable on the standards by means of slots and set-screws. The cross-bars B' B<sup>2</sup>  
85 carry upright pieces B<sup>5</sup>, which in the machine shown extend above and below the bars, and similar uprights B<sup>5</sup> are also carried by the supports. It will be seen that these supports, with their uprights, and the cross-bars, with  
90 their uprights, constitute a frame adjustable in size for retaining in proper condition to be acted upon by the feeding devices hereinafter to be described a pile or stack of sheets, papers, pamphlets, magazines, or similar articles.

Reciprocating on the ways A', before referred to, is a carriage C. This carriage is preferably provided with rollers C' and bears upon its top two sets of pile-supports C<sup>2</sup> C<sup>3</sup>, which in this embodiment of the invention consist of slats, these slats being arranged  
100



with an opening or space between their abutting ends, as will clearly appear from Fig. 6. The carriage may be reciprocated in any convenient manner, but preferably is operated  
 5 from a pair of cranks D D', operated from a shaft E, which is suitably journaled in the frame of the machine and rotated by a gear-wheel G on a shaft G' through suitable intermediates. Power is transmitted to the gear-  
 10 wheel G in any suitable manner. It is obvious that as the carriage is reciprocated beneath a pile or stack of sheets, papers, pamphlets, magazines, &c., held in the adjustable frame, before referred to, the said pile will  
 15 always be sustained in position either by one or the other or both of the sets of slats C<sup>2</sup> C<sup>3</sup>.

The carriage C has suitably mounted in it a shaft F. This shaft carries a series of grooved rollers F', which are fast upon it, and  
 20 also has fast upon it a gear-wheel H and a disk I. Passing through the grooved rollers, before referred to, and also through the gear-wheel H and the disk I is a shaft K. This shaft K is provided with a series of hooks or  
 25 pins K', which are at proper times, by mechanism hereinafter described, thrust into or caused to impale the lower article of the pile, after which they act in connection with the  
 30 grooved rollers to detach the said article, as will be described. One end of the shaft K, preferably the end near the gear-wheel G, carries an operating-arm K<sup>2</sup>, which at proper  
 35 times engages with suitably-arranged projections K<sup>3</sup> K<sup>4</sup>, the projection K<sup>3</sup> being mounted in a projection or boss K<sup>5</sup> on the carriage C and the projection K<sup>4</sup> being mounted in the  
 40 frame A. The shaft K also carries, preferably at the opposite end, a stop-plate K<sup>6</sup>, provided with a pair of stops K<sup>7</sup> K<sup>8</sup>, which alternately engage with a stop-pin K<sup>9</sup>, mounted  
 45 in the disk I. The stop-plate K<sup>6</sup> also carries a pin K<sup>10</sup>. To this pin is connected one end of a spring K<sup>11</sup>, the other end being connected to a pin K<sup>12</sup>, which is also mounted in a disk  
 50 I. The spring is arranged in a well-known way, so that when the shaft K is rocked and the stop-plate moved thereby until the pin K<sup>10</sup> passes the center the spring assists and  
 continues the movement until one or the other  
 55 of the stops K<sup>7</sup> K<sup>8</sup> engages the stop-pin K<sup>9</sup>, when the plate and the shaft will be reliably held in position by it.

Suitably mounted in the frame is a shaft L, which supports a series of tape-rolls L'.  
 55 This shaft preferably carries a gear-wheel L<sup>2</sup>, which meshes with the gear G, by which the shaft and the tape-rolls are revolved. Tapes M pass around and are driven by the rolls L', before referred to, the tapes being supported  
 60 at the other end by tape-rolls M', suitably mounted on a shaft N. The tapes are preferably arranged so that their upper stretch or run is substantially tangential to the circumference of the grooved rollers F'.

65 Mounted on the shaft G' of the gear-wheel G is an operating-cam G<sup>2</sup>. This operating-cam G<sup>2</sup>, through the medium of suitable arms,

operates a series of suitably-mounted drop-rolls O, the construction being common and well understood by those skilled in the art to  
 70 which this invention appertains.

The gear H engages and is operated by a stationary rack R, which is preferably mounted on arms projecting inwardly from one of  
 75 the standards B of the pile-retaining frame, before referred to. As the carriage C reciprocates, it will be obvious that the shaft F not only reciprocates therewith, but it also  
 80 rotates around its own axis by reason of the engagement of the gear H with the rack R, before referred to.

S indicates a belt-tightener of an ordinary type, the parts of which need not be specifically described.

The construction being as above stated and  
 85 the parts being in the position shown in Fig. 1, it will be understood that the operating-arm K<sup>2</sup> has struck the projection K<sup>5</sup>, and the shaft K has consequently been rocked so that  
 90 the stop K<sup>8</sup> on the stop-plate K<sup>6</sup> has been brought into contact with the stop K<sup>9</sup> on the disk I. When the shaft K is in this position, the pins K' have been thrust into or impaled  
 95 a sheet, paper, pamphlet, or magazine, as the case may be, and the mechanism is ready to withdraw the same from the pile or stack. In  
 100 the continued operation of the machine the cranks D D' revolve in the direction indicated by the arrow in Fig. 1, causing the carriage to move to the right of the observer. As the  
 105 carriage starts to move, the gear-wheel H, under the influence of the rack R, is caused to rotate in the direction of the arrow in Fig. 1, causing the shaft F to rotate and to carry  
 110 with it the grooved rolls F' and the shaft K with its pins K'. The pins K' hold the forward edge of the sheet, paper, or other article into which they have been thrust down upon  
 115 the circumference of the grooved rolls F', and as the edge is held by the pins and the rolls the paper will, by the rotation of these parts about the axis of the shaft F, be bent down  
 120 through the opening between the series of slats C<sup>2</sup> and the series of slats C<sup>3</sup>. In the further action of the machine as the carriage continues its movement the sheet is peeled or  
 125 stripped from the under side of the pile by the action of the rolls, the rear pile-support or set of slats C<sup>2</sup> being carried out from under the pile and the ends of the slats C<sup>3</sup> being  
 130 carried under the forward edges of the sheets in the pile. The slats C<sup>3</sup> as they advance not only act to progressively support the pile, but also, in case the sheet which is held between the rolls and the pins has any tendency  
 125 to adhere to the sheet of the pile which is next above it, to peel it off therefrom. As the carriage continues to move to the right the supporting-slats C<sup>2</sup> will pass wholly out from under the pile and the slats C<sup>3</sup> will come into  
 130 position to entirely support the pile. As the gear-wheel H continues its rotation the operating-arm K<sup>2</sup> on the shaft K will strike the projection K<sup>4</sup> on the frame of the machine.



This rocks the shaft K on its axis, causing the pins K' to be withdrawn from the sheet or paper, the shaft being held in its second position by the contact of the stop K<sup>7</sup> with the pin K<sup>9</sup>. The sheet or paper is now fed or drawn out entirely by the action of the rolls F'. The leading end of the sheet as or after it has been released by the pins is by the rotation of the rolls F' brought into contact with the tapes M and is carried forward by them, being thus caused to assume the position shown in Fig. 5. When the carriage has completed its movement to the right, the sheet or paper will have been detached from the pile and laid upon the tapes M, by which it will be carried forward and into contact with the stops P, which form part of the drop-roll mechanism before referred to, and in case there is any tendency on the part of the sheet to adhere to the surface of the rolls the tapes, being, as before described, arranged substantially tangential to the circumference of the grooved rolls F', will, as the head of the sheet meets them, act to sweep it off or detach it from the rolls. At the proper time the drop-roll mechanism will be actuated by the cam G<sup>2</sup> to rock the stops P out of the way and, through the medium of the drop-rolls and their coacting parts, feed the sheets forward under the tapes T, by which they are fed to the wrapping mechanism. After having completed its movement to the right the carriage begins its return reciprocation, the movement of the shaft F and the parts carried thereby being reversed by reason of the engagement of the gear H with the rack. Just as the carriage is about to complete its movement to the left the operating-arm K<sup>2</sup> of the shaft K strikes the projection K<sup>3</sup>, which is mounted on the carriage. The shaft K is rocked thereby, and the pins K' are thus forced into the lower sheet, paper, or article of the pile. This operation is completed just as the carriage completes its return movement.

It will be noted that the slats C<sup>2</sup> (see Fig. 6) have their ends reduced or pointed and projecting into the grooves in the rolls F'. This engagement of the slats with the rolls prevents the edges of any of the sheets from dropping down between the rolls as the slats in the reciprocation of the carriage to the right come under and begin to support the sheets in the pile.

It will be noticed that the reciprocation of the carriage and the pile-supporting devices not only act to detach the sheet or paper from the pile, but the constant movement to and fro under the pile acts to shake up or agitate the pile, and thus tends to overcome the tendency of the individual sheets or papers to adhere to one another, which action, of course, materially assists in the sheet-detaching operation.

While this invention has been described in connection with and is primarily intended to be used for feeding folded papers, magazines, pamphlets, and similar articles to wrapping-

machines, it has, of course, a far wider application and is capable of use in many other relations. It is not, therefore, to be restricted to the described use, and it is to be understood that the term "sheet" which is used in the appended claims is not to be given a restricted signification, but is intended to cover generically any article capable of being acted upon by the detaching devices.

It is also to be understood that the invention is not to be restricted to the particular mechanisms or devices employed to effect the several operations, as many modifications are possible. For instance, while the pins which hold the papers or other articles to be fed by the detaching-rolls form an effective means for this purpose, many other devices may be used. So, too, the pile-supporting devices may be varied within wide limits and the same is true of the other parts of the apparatus. While, also, it is desirable in many cases to feed from the bottom of a pile of papers, sheets, &c., it is also obvious that with slight changes the apparatus is capable of taking sheets from the top of a pile, in which case, of course, the pile would be supported otherwise than by the pile-supports, which in that case would operate only to assist the detaching devices in their action. It is to be understood, therefore, that the invention is not to be limited to the details described, but is generic in its nature and scope.

What I claim is—

1. In a feeding mechanism, the combination with a pile-retaining device, of a sheet-detaching device reciprocating with respect to the pile, and means for acting on the pile on each side of the sheet-detaching device, said means being progressively withdrawn from in front of the detaching device and progressively advanced behind it, substantially as described.

2. In a feeding mechanism, the combination with a pile-retaining device, of a sheet-detaching device, means for giving the sheet-detaching device both rotary and reciprocating movements, and means for acting on the pile on each side of the sheet-detaching device, said means being progressively withdrawn from in front of and progressively advanced behind the sheet-detaching device, substantially as described.

3. In a feeding mechanism, the combination with a pile-retaining device, of a carriage reciprocating with respect to the pile-retaining device, a rotating sheet-detaching device carried by the carriage, and means for acting on the pile also carried by the carriage and located on each side of the sheet-detaching device, whereby as the detaching device acts to withdraw the sheet the said means for acting on the pile will be progressively advanced behind the detaching device and withdrawn from in front of it, substantially as described.

4. The combination with a pile-retaining device of a sheet-detaching device moving



with respect to the pile of sheets and means moving with the detaching device and acting to agitate or move the pile with respect to the pile-retaining device.

5 5. The combination with a pile-retaining device of a sheet-detaching device moving beneath the pile of sheets and a pile-support also moving beneath the pile and acting by its movement to shake or agitate the pile of  
10 sheets in the retaining device.

6. The combination with a pile-retaining device, of supports reciprocating beneath the pile-retaining device, and means for taking hold of a sheet at or near its edge and bend-  
15 ing it down beneath one of the supports, substantially as described.

7. The combination with a pile-retaining device, of a pair of pile-supports reciprocating beneath the pile-retaining device, said  
20 supports being spaced apart, and means for taking hold of a sheet at or near its edge and bending it down between said supports, substantially as described.

8. The combination with a pile-retaining device, of pile-supports reciprocating beneath the pile-retaining device, said supports being spaced apart, and a rotating sheet-detaching device acting to take hold of a sheet near its edge and bend it down between said  
30 supports, substantially as described.

9. In a feeding mechanism, the combination with a carriage, of pile-supports mounted on the carriage and spaced apart, and a sheet-detaching device also mounted upon the car-  
35 riage, substantially as described.

10. In a feeding mechanism, the combination with a pile-retaining device, of a carriage reciprocating thereunder, pile-supports mounted upon said carriage and spaced apart,  
40 and a rotary sheet-detaching device mounted between the pile-supports, substantially as described.

11. The combination with a pile-retaining device, of a carriage reciprocating thereunder, pile-supports mounted on said carriage, said pile-supports consisting of slats arranged so as to leave a space between their abutting ends, a shaft mounted on the carriage, a sheet-detaching device carried by the shaft, and  
50 means for rotating the shaft, substantially as described.

12. The combination with a pile-retaining device, of a sheet-detaching device reciprocating beneath the pile-retaining device, and  
55 means for supporting the pile as the sheet-detaching device withdraws a sheet therefrom, said means being progressively withdrawn from in front of the sheet-detaching device as the sheet is withdrawn and progressively  
60 advanced in the rear of it, substantially as described.

13. The combination with a pile-retaining device, of a rotary sheet-detaching device reciprocating beneath the pile-retaining device, and means for supporting the pile as the sheet-detaching device withdraws a sheet there-  
65 from, said means being progressively with-

drawn from in front of the sheet-detaching device as the sheet is withdrawn and progressively advanced in the rear of it, substantially  
70 as described.

14. The combination with an adjustable pile-retaining device, of a sheet-detaching device reciprocating beneath the pile-retaining device, and means for supporting the pile as  
75 the sheet-detaching device withdraws a sheet therefrom, said means being progressively withdrawn from in front of the sheet-detaching device as the sheet is withdrawn and progressively advanced in the rear of it, sub-  
80 stantially as described.

15. The combination with an adjustable pile-retaining device, of a rotary sheet-detaching device reciprocating beneath the pile-retaining device, and means for supporting the  
85 pile as the rotary sheet-detaching device withdraws a sheet therefrom, said means being progressively withdrawn from in front of the rotary sheet-detaching device as the sheet is withdrawn and progressively advanced in the  
90 rear of it, substantially as described.

16. The combination with a pile-retaining device, of a carriage reciprocating thereunder, pile-supports carried by the carriage and spaced apart, a rotary sheet-detacher carried  
95 by the carriage, and suitable forwarding devices receiving the sheet from the sheet-detacher, substantially as described.

17. In a sheet-detaching device, the combination with a reciprocating carriage provided  
100 with sheet-supports spaced apart, a shaft mounted in the carriage, means for giving the shaft a rotary movement, sheet-detaching rolls carried by the shaft, a second shaft carrying devices which cooperate with the  
105 rolls for holding the sheet, and means for causing said devices to lay hold of and release a sheet, substantially as described.

18. The combination with a reciprocating carriage carrying sheet-supports spaced apart,  
110 of a shaft mounted in said carriage, means for causing the shaft to rotate therein, sheet-detaching rolls mounted on the shaft, a second shaft mounted in the rolls and carrying devices cooperating with the rolls for holding  
115 a sheet, and means for periodically causing the cooperating devices to lay hold of and release a sheet, substantially as described.

19. The combination with a reciprocating carriage carrying sheet-supports spaced apart,  
120 of a shaft mounted in said carriage, means for causing the shaft to rotate therein, sheet-detaching rolls mounted on the shaft, a second shaft mounted in the rolls, devices mounted on the second shaft and cooperating with  
125 the rolls for holding a sheet, means for periodically causing the devices to lay hold of and release a sheet, and suitable sheet-forwarding devices, substantially as described.

20. The combination with a carriage, of a  
130 shaft mounted therein, sheet-detaching rolls mounted on the shaft, a gear also mounted on the shaft, a second shaft mounted in the rolls and carrying devices which cooperate



with the rolls for laying hold of a sheet, an arm on the shaft, suitably-mounted projections for actuating the arm to cause the sheet-detaching devices on the shaft to lay hold of and release the sheet at proper times, and means for causing the shaft to remain in the position in which it is thrown by either projection until it is thrown into the second position by the other projection, substantially as described.

21. The combination with a pile-retaining device, of a carriage reciprocating thereunder and provided with sheet-supports spaced apart, a shaft mounted in said carriage, a gear on the shaft, a stationary rack with which the gear engages as the carriage reciprocates, a second shaft, devices carried by the second shaft for laying hold of a sheet, means for causing the second shaft to revolve with the first shaft, and means for giving it a movement about its own axis to cause the devices to lay hold of and release the sheet, substantially as described.

22. The combination with a pile-retaining device, of a carriage, sheet-supporting devices carried by the carriage, said supporting devices consisting of slats arranged with a space between their abutting ends, the slats of one set being reduced in size at the end, a shaft mounted in the carriage and located beneath the opening between the sheet-supports, grooved sheet-detaching rolls carried by the shaft, the grooves of the rolls being engaged by the reduced ends of the slats, and

means for laying hold of a sheet and bending it down upon the surface of the sheet-detaching rolls, substantially as described.

23. In a feeding mechanism, the combination with a pile-retaining device, of a rotary sheet-detaching device, pile-supporting devices located on each side of the detaching device, means for reciprocating the pile-supporting and sheet-detaching devices, means for causing the sheet-detaching device to lay hold of and release a sheet, and a traveling sheet-carrier arranged tangentially to the detaching device and acting to take the sheet therefrom, substantially as described.

24. In a feeding mechanism, the combination with a frame formed to provide suitable ways, a pile-retaining frame having a fixed location with respect to the frame, a carriage reciprocating on the frame, pile-supports carried by the carriage and spaced apart, a rotary sheet-detaching device mounted in the carriage and located at the opening between the pile-supports, and tapes running upon rolls mounted in the frame and acting to receive the sheets from the sheet-detaching device, substantially as described.

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

LUTHER C. CROWELL.

Witnesses:

JAMES Q. RICE,  
A. L. KENT.