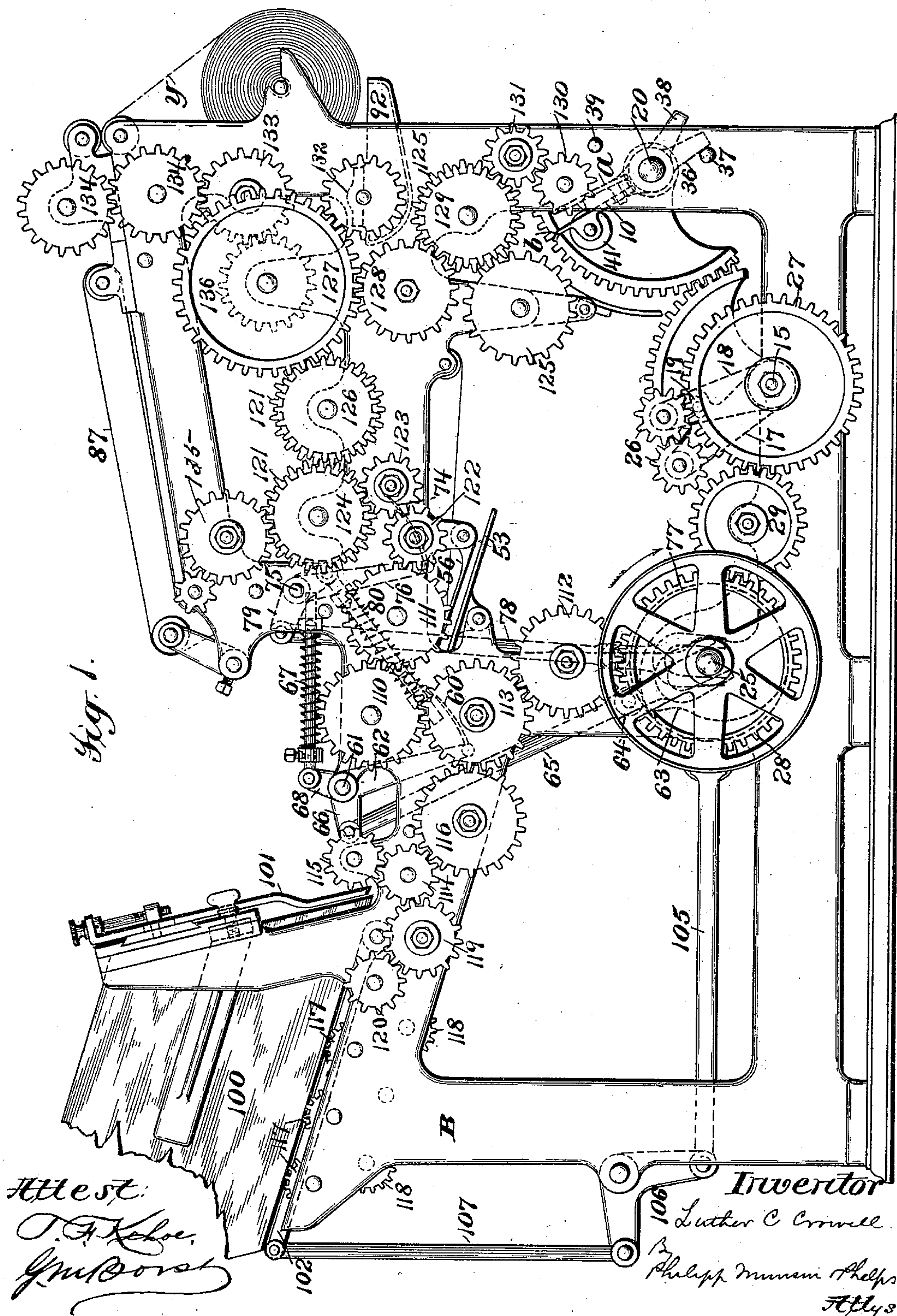


Patented Dec. 20, 1898.

(Application filed May 6, 1896.)

7 Sheets—Sheet 1.



No. 616,083.

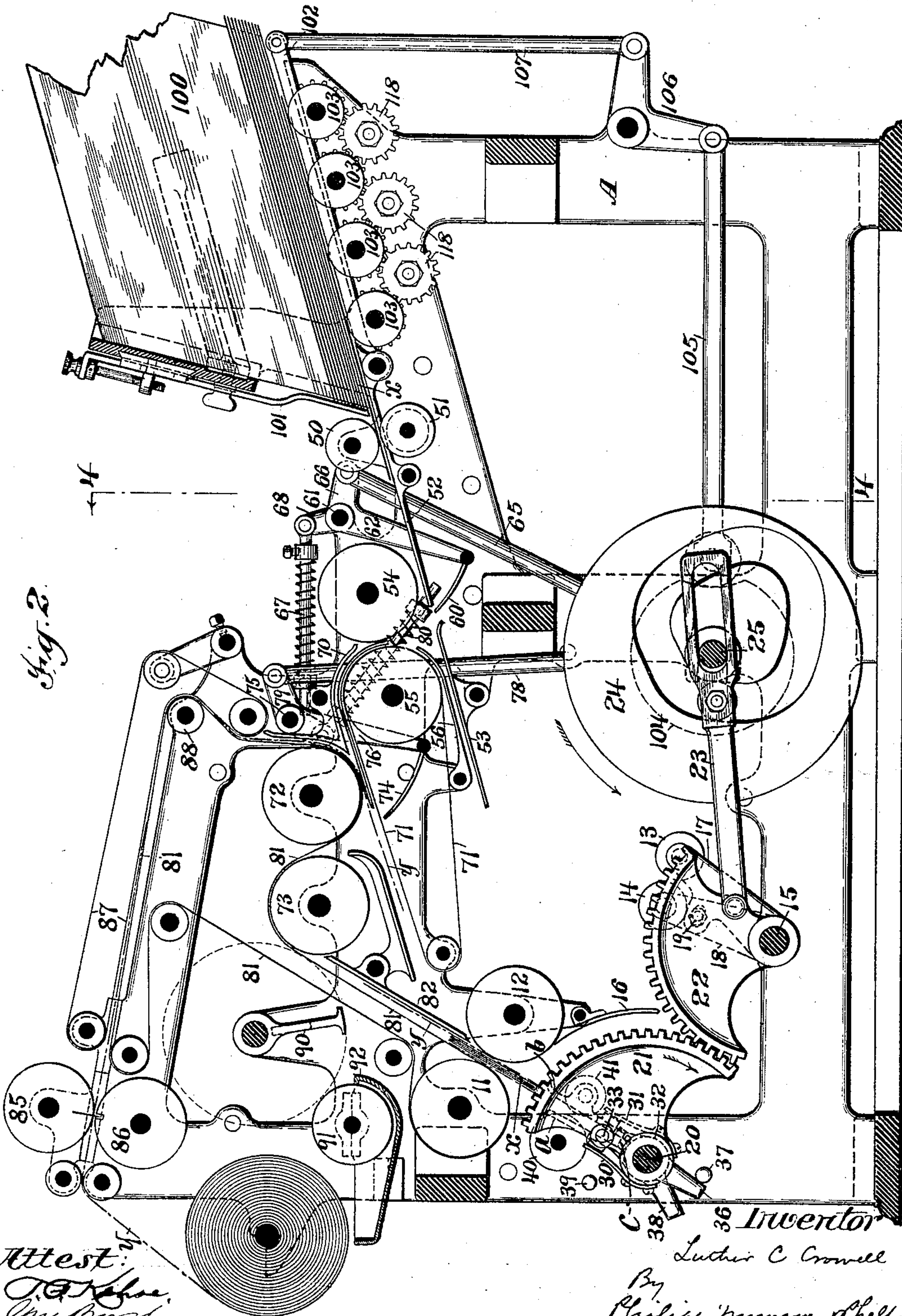
Patented Dec. 20, 1898.

L. C. CROWELL.
FOLDING AND WRAPPING MACHINE.

(Application filed May 6, 1896.)

(No Model.)

7 Sheets—Sheet 2.



Attest:
J. A. Kline,
J. M. Bush.

Inventor
Luther C. Crowell
By
Philip H. Munroe Phelps
Attys

No. 616,083.

Patented Dec. 20, 1898.

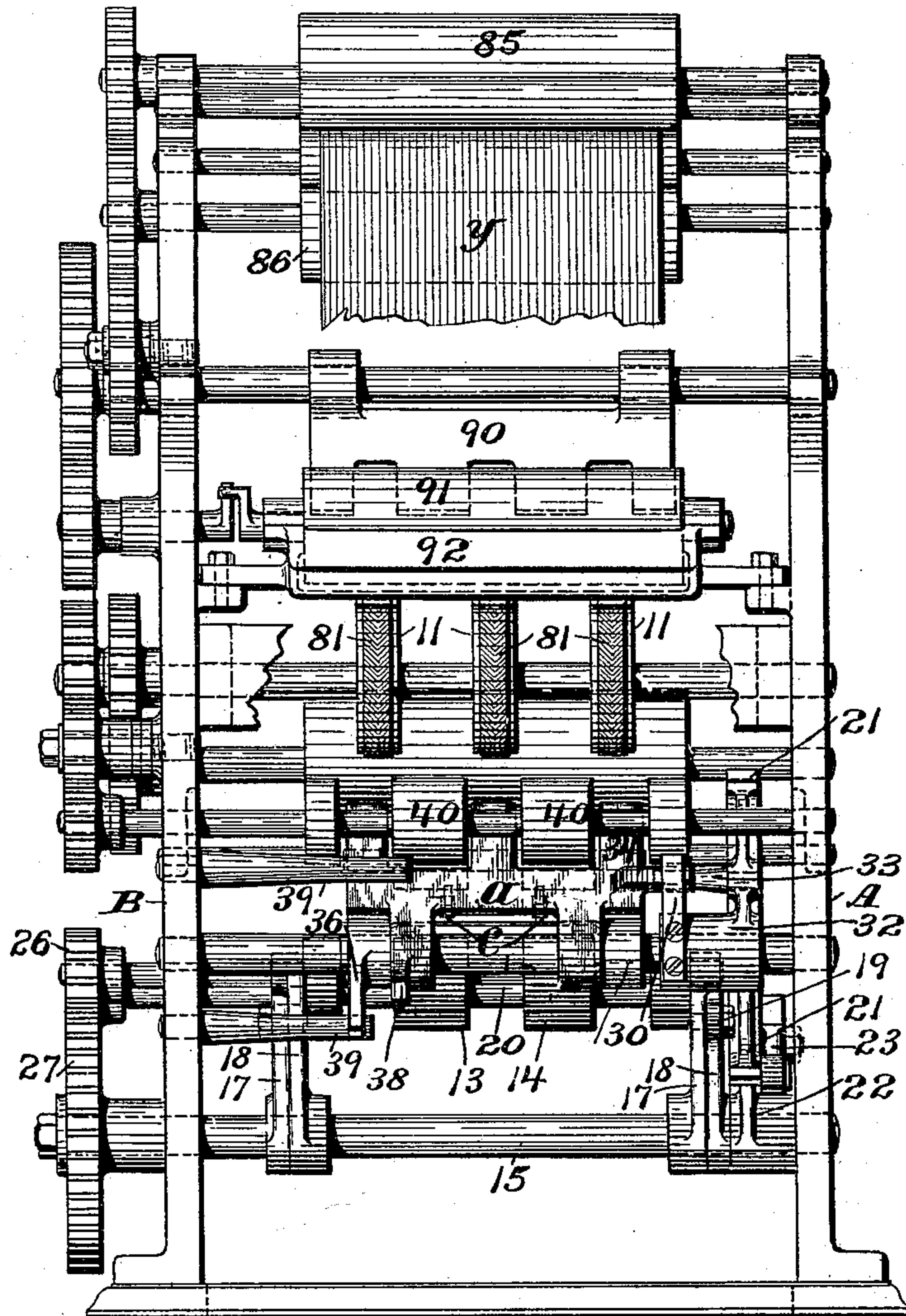
L. C. CROWELL.
FOLDING AND WRAPPING MACHINE.

(Application filed May 6, 1896.)

(No Model.)

7 Sheets—Sheet 3.

Fig. 3.



Attest:

T. F. Kehoe
John Borst

Inventor:

Luther C. Crowell
By
Philip Munn & Phelps
Attys

No. 616,083.

Patented Dec. 20, 1898.

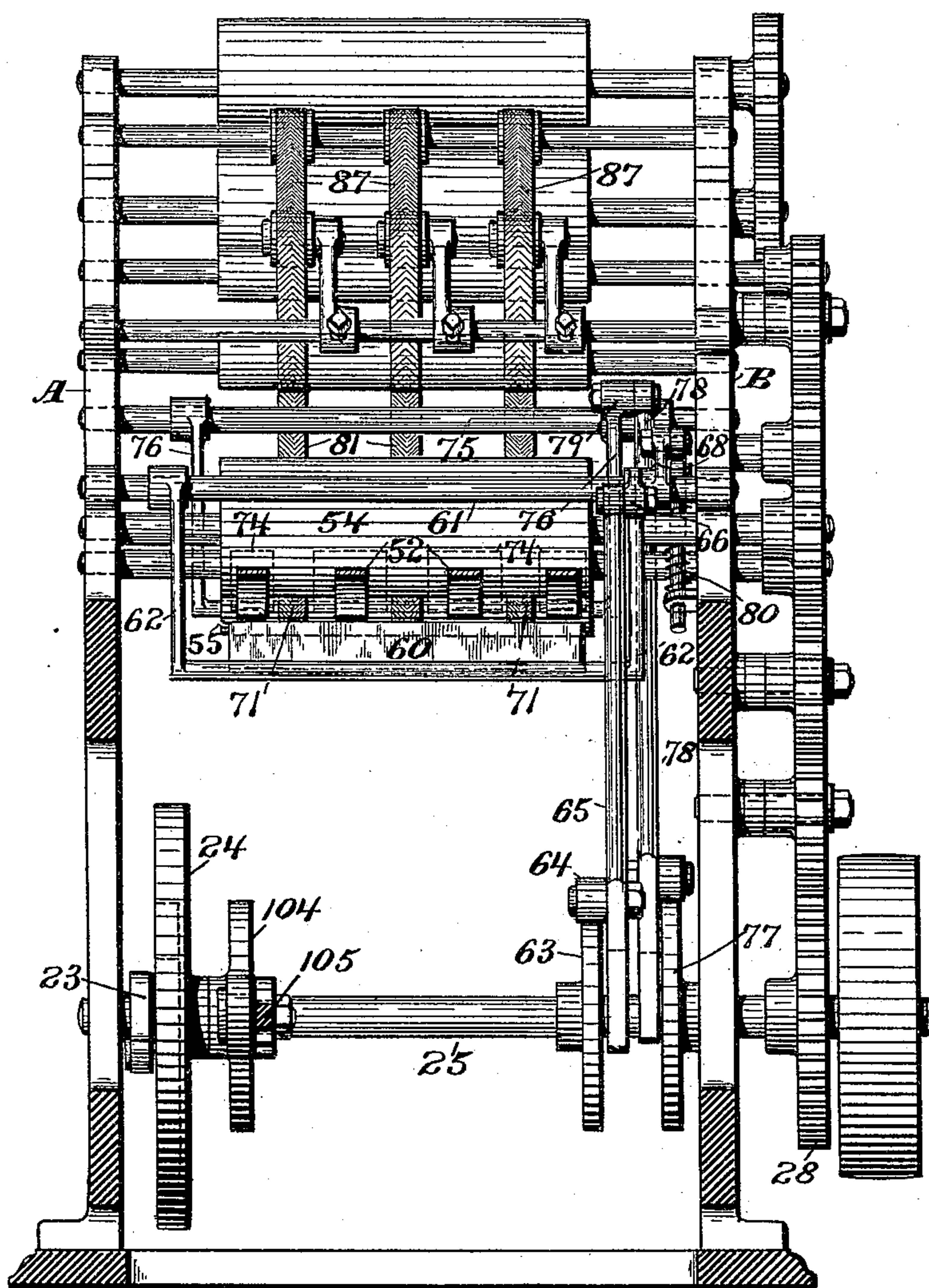
L. C. CROWELL.
FOLDING AND WRAPPING MACHINE.

(Application filed May 6, 1896.)

(No Model.)

7 Sheets—Sheet 4.

Fig. 4.



Attest:
T. F. Kehoe
J. M. Borch

Inventor:
Luther C. Crowell
By Philipp Munson Phelps
Attys

No. 616,083.

Patented Dec. 20, 1898.

L. C. CROWELL.
FOLDING AND WRAPPING MACHINE.

(Application filed May 6, 1896.)

(No Model.)

7 Sheets—Sheet 5.

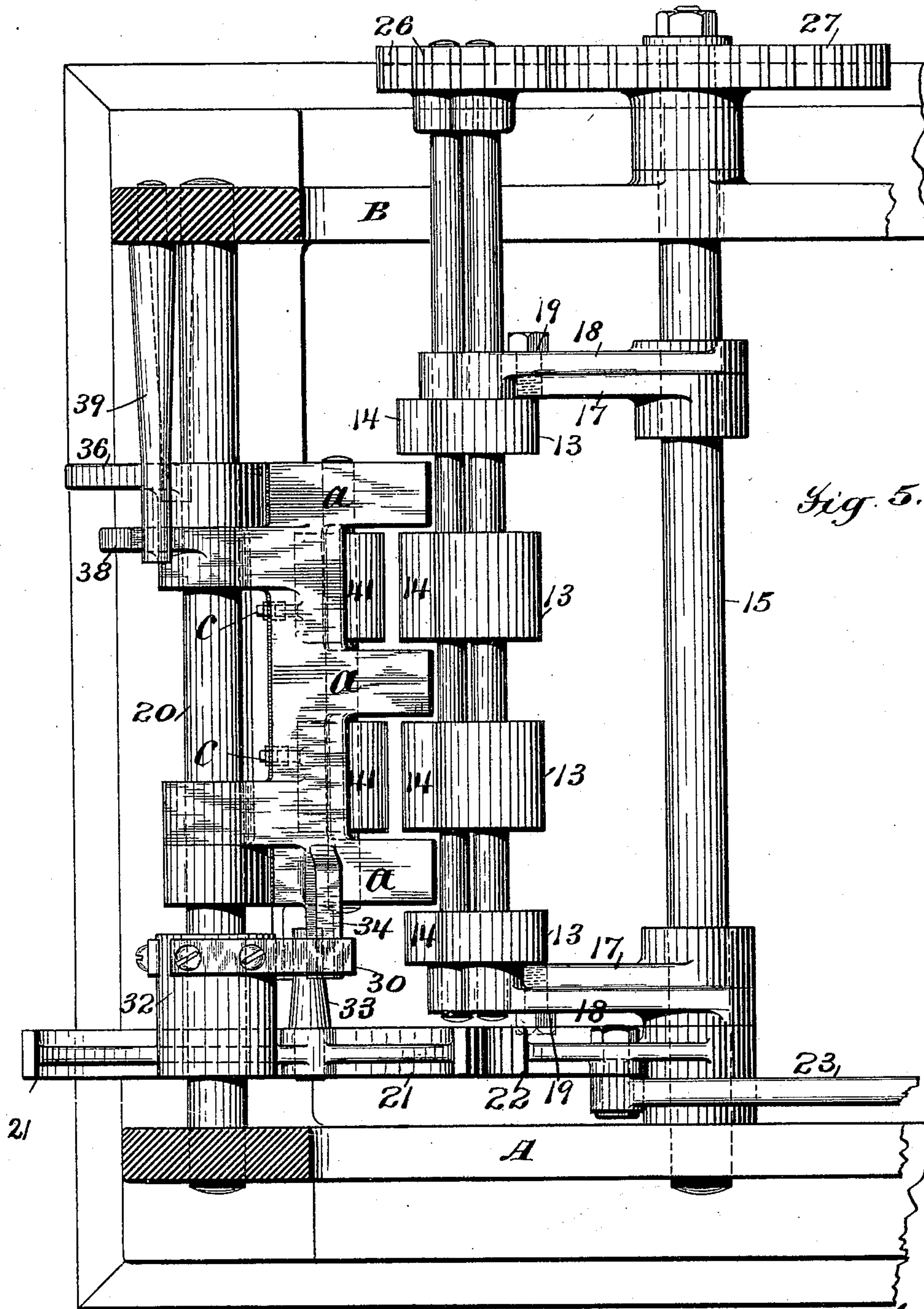


Fig. 5.

Attest:

T. F. Kehoe
J. M. Borch

Inventor
Luther C. Crowell
By Philipp Munson Phelps
Attys

No. 616,083.

Patented Dec. 20, 1898.

L. C. CROWELL.
FOLDING AND WRAPPING MACHINE.

(Application filed May 6, 1896.)

(No Model.)

7 Sheets—Sheet 6.

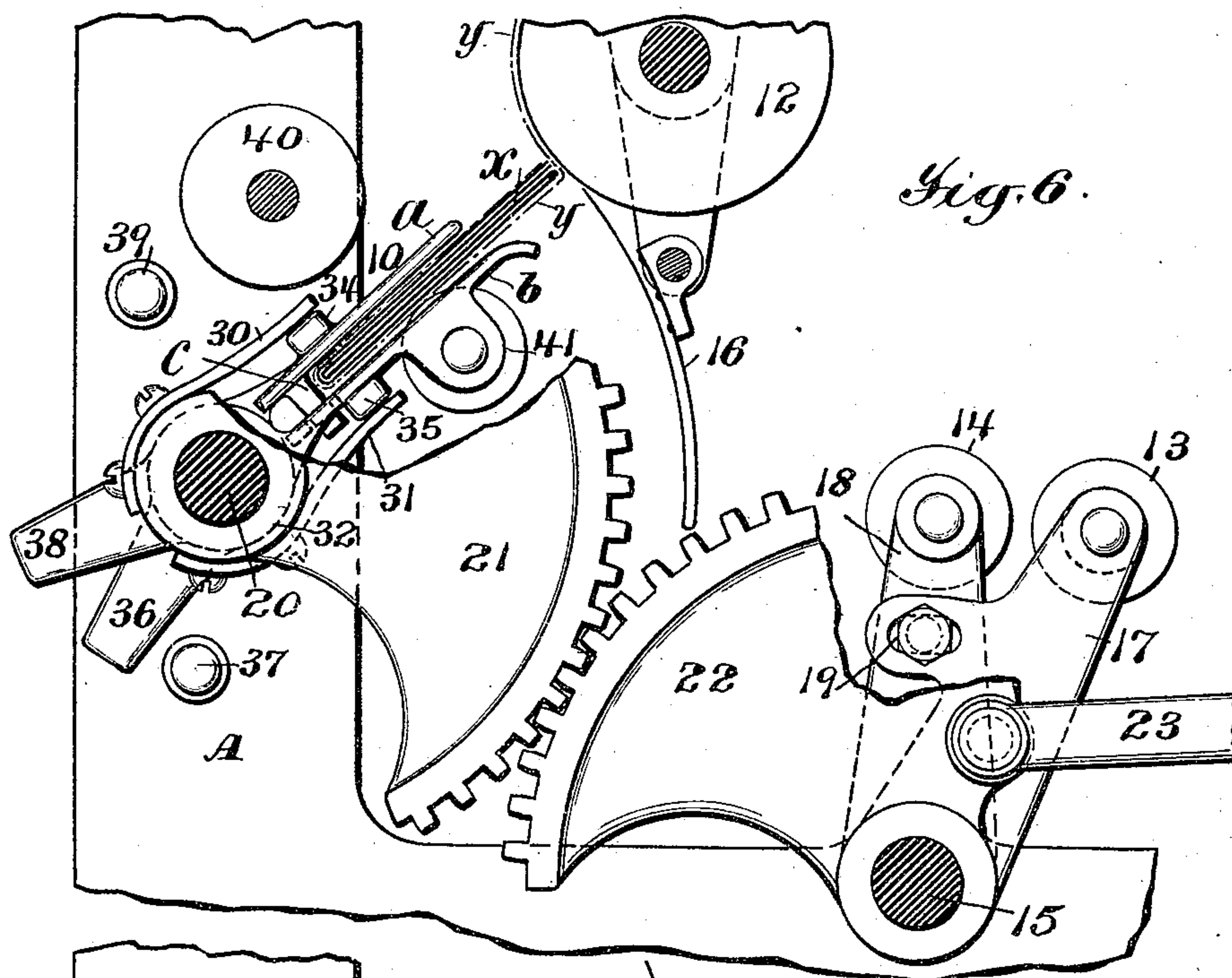


Fig. 6.

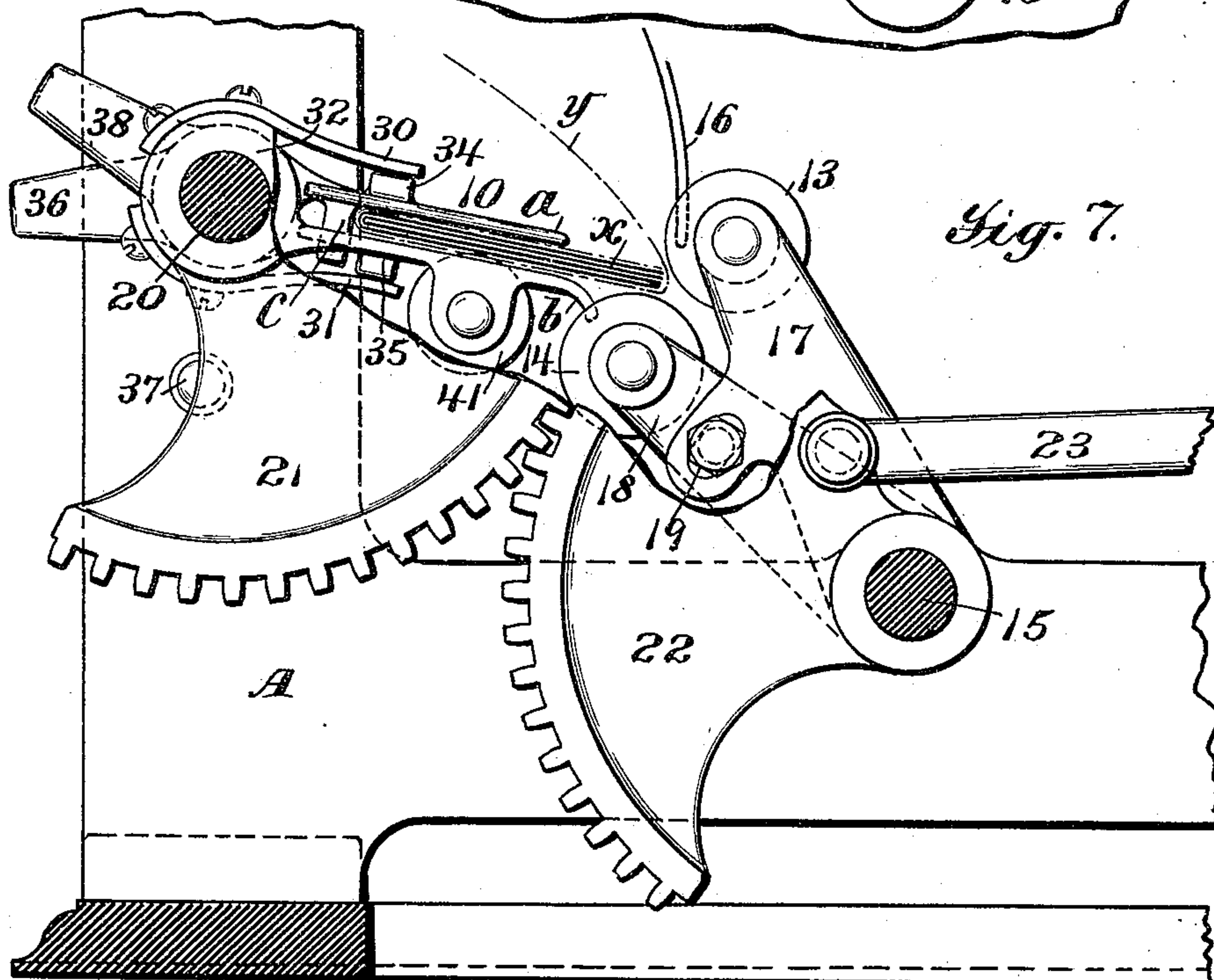


Fig. 7.

Attest:

J. F. Kline
J. M. Dorst

Inventor:

Luther C. Crowell
By *Philip M. Munn*
Attys

No. 616,083.

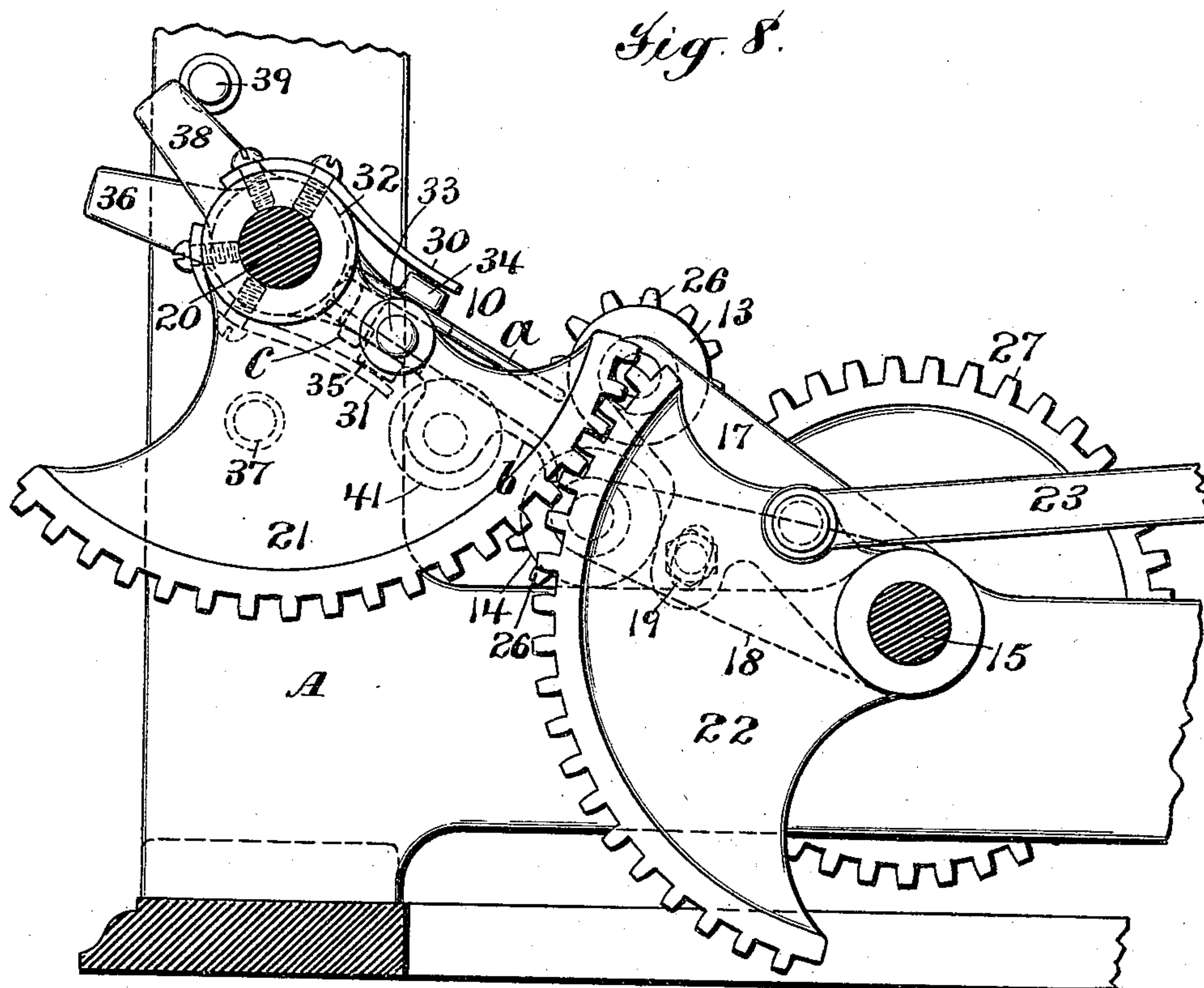
Patented Dec. 20, 1898.

L. C. CROWELL.
FOLDING AND WRAPPING MACHINE.

(Application filed May 6, 1896.)

(No Model.)

7 Sheets—Sheet 7.



Attest:

T. F. Lohoe
G. M. Dorset

Inventor:

Luther C Crowell

By
Philippe Munnem Schels

Allys

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.

FOLDING AND WRAPPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 616,083, dated December 20, 1898.

Application filed May 6, 1896. Serial No. 590,398. (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, (Brooklyn,) county of Kings, and State of New York, have invented certain new and useful Improvements in Folding and Wrapping Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The especial object of this invention is to provide an improved machine of that class used for wrapping newspapers and other publications for mailing; but the construction embodying the invention is applicable also in folding without wrapping.

More particularly, the machine of the present invention is of that class in which the paper or other article to be wrapped is advanced to a carrier with the wrapper lapped over the leading end or edge of the paper and the other end of the wrapper projecting behind the paper sufficiently to overlap upon the first layer of wrapper on the paper and then transferred by the carrier and its rear end with the flap of the wrapper turned about it delivered between pressing-surfaces, by which the flap is pressed down upon the layer of wrapper on the paper, and thus secured by paste previously applied.

According to the present invention the carrier and the pressing devices are caused to approach each other after the paper and wrapper have been fed into the carrier, so as to cause the paper to be positively entered between the pressing-surfaces, which are preferably provided by a pair of rolls forming pressing and delivery devices. The carrier and these rolls are preferably caused to approach each other by giving them a movement of rotation in opposite directions, and this is preferably an oscillatory movement—that is, a movement of partial rotation and back again—the centers about which they oscillate being so positioned and their movement being such that they simultaneously move toward a line extending between their centers of oscillation. To this end the carrier and the pair of pressing and delivery rolls are preferably mounted on shafts which carry intermeshing segmental gears, whereby

the required relative movements of the carrier and the pressing and delivery rolls are secured.

The invention consists, further, in various features contributing to the successful operation of wrapping, which will be hereinafter specifically pointed out in the claims after a detailed description of a construction embodying the various features of the invention.

This wrapping mechanism may be fed by hand, or any suitable devices may be provided for automatically feeding the papers and wrappers at the proper intervals. A machine embodying the invention may be designed to wrap papers which have been previously folded to the desired size for wrapping, or the papers may be folded by mechanism embodied in and forming part of the machine, or the wrapping mechanism may be combined with the delivery and folding mechanism of a printing-press, as is customary with other forms of wrapping mechanism now in use, suitable mechanism being provided for associating the wrappers with the papers, so that the papers shall be advanced to the wrapping mechanism with the wrapper turned about the leading end of the paper and projecting behind the paper sufficiently to overlap on the layer of wrapper on the paper when it is turned about the end of the paper in the further operation of wrapping.

For a full understanding of the invention a detailed description will now be given of a complete folding and wrapping machine embodying the various features of the invention in a preferred form, reference being had to the accompanying drawings, illustrating such a machine, and the features forming the invention will be afterward specifically pointed out in the claims.

In said drawings, Figure 1 is an elevation of the gear side of the machine. Fig. 2 is a sectional view taken just inside of the frame from the other side of the machine. Fig. 3 is an elevation of the front end of the machine, taken from the left of Fig. 2, the roll of wrapper-web being removed. Fig. 4 is a section on line 4 of Fig. 2. Fig. 5 is a plan view of the wrapping mechanism in the position shown in Fig. 8, and Figs. 6, 7, and 8 are views showing the wrapping mechanism

in successive positions during the operation of wrapping.

Referring to said drawings, the various parts of the machine are supported by side frames A B and are arranged so that the papers being fed from a paper-feeding mechanism at the rear end of the machine are advanced through the folding devices to the wrapping mechanism located at the forward end of the machine, wrapper-feeding mechanism being located in the upper forward part of the machine and arranged to feed the wrappers to be associated with the papers during the last fold of the paper and suitable pasting mechanism being provided.

The machine, as shown, is intended to be supplied with newspapers partially folded, as by the delivery mechanism of a printing-press or other folding-machine for delivery to carriers or for street or counter sale, or with other periodicals or pamphlets, and is designed to fold such papers or other publications twice and to apply and secure the wrapper thereto.

The wrapping mechanism proper will be first described, and afterward a general description of the complete machine shown will be given by following in a general way the course of the papers through the machine. With regard, first, then, to the wrapping mechanism proper, a carrier 10 receives the paper as it is advanced from the feeding devices, consisting, preferably, of rolls 11 and 12, as shown, with the wrapper turned about the leading end of the paper and projecting behind the paper sufficiently to overlap on the layer of wrapper on the paper, and transfers its rear end to pressing and delivery devices, formed, preferably, by a pair of rolls 13 and 14, simultaneously folding the rearwardly-extending flap of the wrapper over the end of the paper. The rolls 13 and 14 are preferably mounted to oscillate, so as to approach the carrier for receipt of the paper, and are preferably adjustable toward and away from each other to accommodate papers of different thickness. For this purpose they are mounted to rotate in arms 17 and 18, carried by a rock-shaft 15, the arms carrying one of the rolls being fast on the shaft and the other pair of arms being adjustably secured to the first pair of arms, as by a pin-and-slot connection, as shown at 19.

The carrier is preferably formed of side plates *a* and *b*, mounted on a shaft 20, so that the carrier may be oscillated back and forth between its receiving and delivery positions. (Shown in Figs. 2 and 8, respectively.) After the papers have been advanced by the rolls 11 and 12 into the carrier the carrier is oscillated toward a line extending between the shaft 20 and the rock-shaft 15, and the shaft 15 is rocked, so as to carry the pressing and delivery rolls 13 and 14 toward said line simultaneously with the movement of the carrier, whereby the carrier and the pressing and delivery rolls are caused to approach each

other as they move toward the position in which the pressing and delivery rolls receive the paper from the carrier. As the paper is transferred by the carrier after leaving the rolls 11 and 12 the rearwardly-extending flap of the wrapper is turned over the end of the paper by means of an abutment suitably positioned for this purpose. Preferably the carrier is, as shown, so positioned with relation to the rolls 11 and 12 that one of said rolls 12 acts as an abutment to turn the flap of the wrapper over the end of the paper as it is moved past it by the carrier, and the wrapper is held in this position during the further movement of the carrier by means of a guard 16, extending concentrically with the shaft 20 from the roll 12 toward the point at which the paper is delivered to the pressing and delivery rolls.

For the purpose of securing the proper relative movements of the carrier and the pressing and delivery rolls they are preferably moved through intermeshing segmental gears 21 22, mounted on the shafts 20 and 15, respectively, which gears are oscillated by a pitman 23, connected to one of the gears, as 22, and carrying a bowl which runs in a cam-groove in a cam-disk 24 on the main driving-shaft 25.

The pressing and delivery rolls 13 and 14 are provided with intermeshing gears 26 on their respective shafts and are preferably driven by a gear 27, free to turn on the shaft 15 and meshing with the gear 26 on the shaft of the roll 14, and which gear 27 is driven by a gear 28 on the main driving-shaft 25 through an intermediate 29.

It is desirable that the papers may be easily fed into the carrier 10 and easily drawn out therefrom when engaged by the pressing and delivery rolls and that the carrier shall hold the paper securely while transferring it from the feeding devices to the pressing and delivery devices. For this purpose the carrier is constructed substantially as follows: Its two side plates *a* and *b* are each independently mounted on the shaft 20 by means of sleeves free to turn on said shaft and are pressed toward each other by means of springs 30 and 31, carried by a sleeve 32, which carries the segmental gear 21, said springs engaging, respectively, a lug 34, extending from the plate *a*, and a lug 35, extending from the plate *b*, the plates being prevented from moving toward each other beyond a certain point by means of a stop 33, carried by the sleeve 32 and extending between the lugs 34 and 35, carried by the side plates *a* and *b*. The side plates *a* and *b* of the carrier will thus be oscillated through the stop 33 and the springs 30 and 31 when the sleeve 32 is oscillated through the segmental gear 21, as will be readily understood. One of the sleeves carrying the side *b* of the carrier is provided with a backwardly-extending lug 36, which as the carrier approaches its receiving position, as shown in Fig. 2, is engaged by an abutment or stud 37 on the frame of the machine, where-

by the side *b* of the carrier is moved against the tension of the spring 31, whereby the carrier is opened to receive the paper, the other side *a* of the carrier being held by the stop 33. Similarly the sleeve carrying the side *a* of the carrier is provided with a backwardly-extending lug 38, which as the carrier approaches its delivery position, as shown in Fig. 8, is engaged by an abutment or stud 39 on the frame of the machine, whereby this side of the carrier is moved against the tension of the spring 30 to open the carrier for delivery of the paper. The stop 33 is of such a thickness as to allow the two plates of the carrier to approach each other under the tension of the springs, so as to securely hold the thinnest papers on which it may have to operate. It will be seen that a carrier thus formed will accommodate itself to papers of different thicknesses without adjustment.

In order that the paper may be positively fed into the carrier, I provide a feeding roll or rolls 40, which, acting through openings in the side plate *a* of the carrier when the carrier is in its receiving position, as shown in Fig. 2, engage the paper as it is advanced into the carrier from the rolls 11 and 12 and feed it positively into the carrier against a stop *c*, carried by one of the sides, as *a*. A roll or rolls 41 are preferably carried by the other side plate of the carrier to coact with the rolls 40.

The pressing and delivery rolls 13 and 14 are preferably sectional or grooved rolls to accommodate the ends of the side plate *b* of the carrier and of the curved guards 16, which are preferably of such a length as to extend slightly within the periphery of these rolls in certain positions of the parts, as shown in the various figures.

When the carrier is in its receiving position, as shown in Fig. 2, a paper is advanced by the feeding-rolls 11 and 12 with the wrapper turned about the leading end of the paper and projecting behind the paper sufficiently to overlap on the layer of wrapper on the paper and enters the carrier and is engaged and further advanced by the feeding-rolls 40 41 against the stop *c*.

The cam 24, by which the wrapping mechanism is operated, is formed with a concentric portion or dwell, whereby the carrier is held stationary in its receiving position long enough to receive the paper. Then by the further revolution of the cam the carrier is moved about the shaft 20 in the direction of the arrow in Fig. 2, whereby as the paper is carried past the periphery of the roll 12 the wrapper is folded over the end of the paper, as shown in Fig. 6. As the carrier is further advanced about the shaft 20 the wrapper is held turned over the end of the paper by the guard 16 until the parts approach the position shown in Fig. 7, where the pressing and delivery devices have come into position to receive the rear end of the paper with the wrapper turned about it. Then by the fur-

ther movements of the parts, the carrier and the pressing and delivery rolls approaching each other as they approach the line extending between the centers of the shafts 20 and 15, the paper is positively entered between the pressing and delivery rolls, the flap of the wrapper being further turned back against the side of the paper by the roll 13, and the wrapped paper is drawn out of the carrier by the pressing and delivery rolls, the carrier being opened by the stud 39 engaging the lug 38 as the parts reach the position shown in Fig. 8. Then by the further movement of the cam 24 the pitman 23 is drawn back and the carrier and the pressing and delivery rolls are returned to their former positions, as shown in Fig. 2, and the same movements are repeated for the wrapping of each paper.

The papers may be delivered from the rolls 13 and 14 into a suitable receptacle or onto a carrier-belt or in any suitable manner.

A general description of the complete machine illustrated in the drawings will now be given.

The paper *x* is advanced from the paper-feeding mechanism by feeding-rolls 50 and 51 over supporting-guides 52 and 53 beneath a pair of folding-rolls 54 and 55, a guard 56 being provided beneath the roll 55 to prevent the paper coming in contact therewith as it is fed forward beneath it. A folding-blade 60 is arranged to be advanced between the guides 52 and 53 from beneath to engage the paper on the fold-line as it is advanced beneath the rolls 54 and 55 to carry the folded edge upward between said rolls. The folding-blade is carried by a rock-shaft 61 by means of arms 62, and its movement is controlled by a cam 63 on the main driving-shaft 25, which engages a bowl 64 on a pitman 65, which is connected to an arm 66 on the rock-shaft 61, the cam being formed to rock the shaft 61 to draw the blade back after its folding movement and so as to allow the shaft to be rocked by means of a spring-rod 67, connected to an arm 68 on the shaft for the folding movement of the blade. As the paper is advanced by the rolls 54 and 55 its forward end is engaged by a curved guide 70 and deflected around the roll 55, from which it is advanced on feeding-tapes 71 beneath another pair of folding-rolls 72 and 73, the roll 72 and the tapes coacting to feed the paper. As the paper is advanced along the tapes 71 a wrapper *y* is fed down around the roll 72, so as to be advanced over the tapes 71 above the paper and with its leading end in advance of the paper. When the paper and wrapper have reached the proper position beneath the rolls 72 and 73, the paper is engaged from beneath by a sectional folding-blade 74, which, advancing between the tapes 71, engages the paper on the fold-line and carries the paper and wrapper between the rolls 72 and 73.

The folding-blade 74 is mounted and actuated similarly to the blade 60, being carried

by a rock-shaft 75 by means of arms 76 and its movement being controlled by means of a cam 77 on the main driving-shaft 25 through a pitman 78, connected to an arm 79, carried by the shaft 75 and carrying a bowl which is engaged by the cam. The cam 77 is formed so as to rock the shaft 75 to withdraw the folding-blade after its forward movement and to allow the shaft to be rocked by means of a spring-rod 80, pivotally connected to an arm carried by the shaft for the folding movement of the folding-blade.

The paper after being entered between the rolls 72 and 73 by the folding-blade 74 is turned about the roll 73 by means of tapes 81, passing beneath the roll 72 and up over the roll 73, with the wrapper turned about its leading end and projecting behind the paper sufficiently to overlap on the layer of wrapper on the paper when it is turned over the end of the paper in the further operation of wrapping, as heretofore explained. The paper is then advanced between the tapes 81 and a guide 82 to the feeding-rolls 11 and 12, by which it is fed to the carrier, as heretofore described.

The wrapper *y* is fed from a web supported in the upper forward part of the machine between feeding and perforating rollers 85 and 86, from which it is advanced between the tapes 81 and other tapes 87, which tapes move at a greater speed than the rolls 85 and 86 and turn downward about a roll 88, where they grip the wrappers and separate them on the lines on which they have been perforated. The wrappers are then carried down around the roll 72 to be associated at the proper time with the papers as they are advanced between the roll 72 and the tapes 71.

Paste is applied to the rearwardly-extending flap of the wrapper as the paper and wrapper are being advanced to the rolls 11 and 12 by a rotating paster 90, which receives the paste from a fountain-roll 91, mounted to rotate in a fountain 92. The paster is made sectional to accommodate the tapes 81 and is timed to make one revolution for each paper passing through the machine.

The paper-feeding mechanism shown consists of a holder having sidewise-adjustable sides 100 and a front piece 101, which is adjustable vertically to allow papers of different thickness to be fed forward beneath it over the guide 52. The papers *x* are supported in the box thus formed by means of a bottom 102, formed of slats and which is pivoted near the forward or delivery end of the holder and is lowered at intervals to allow the bottom paper to come in contact with a series of sectional feeding-rolls 103, by which the bottom paper is fed forward to be engaged by the feeding-rolls 50 and 51. The pivoted bottom of the box is raised and lowered by means of a cam 104, carried by the main driving-shaft 25 and which engages a bowl on a pitman 105, connected to one arm of a bell-crank lever 106, the other arm of

which lever is pivotally connected to one end of a connecting-rod 107, which at its other end is pivoted to the bottom 102. Such a paper-feeding mechanism is shown and fully described in my Patent No. 549,111, dated November 5, 1895.

The various feeding-rolls and the paster 90 and fountain-roll 91 are driven in the construction shown from the main driving-shaft 25, as follows: The folding-rolls 54 and 55 are geared together by gears 110 and 111 and are driven from gear 28 on the shaft 25 through intermediates 112 and 113. The feeding-rolls 50 and 51 are geared together by gears 114 and 115 and are driven by an intermediate 116 from the intermediate 113. The rolls 103 of the paper-feeding mechanism are geared together by gears 117 and intermediates 118, so as to rotate all in the same direction, and are driven from the gear 114 through an intermediate 119, meshing with a gear 120 on the first of the rolls 103. The folding-rolls 72 and 73 are geared together by gears 121 and are driven from the gear 111 through an intermediate 122 and a second intermediate 123, meshing with a gear 124 on the shaft of the roll 72. The feeding-rolls 11 and 12 are geared together by gears 125 and are driven from a gear 126 on the shaft of the roll 73 through intermediates 127 and 128, the intermediate 128 meshing with a gear 129 on the shaft of the roll 11. The feeding-roll 40 carries a gear 130 and is driven from the gear 129 through an intermediate 131. The intermediate gear 127 is mounted on the shaft of the paster 90 and is of such a relative size as to cause the paster to rotate once for each rotation of the main driving-shaft 25. The fountain-roll 91 carries a gear 132, meshing with the gear 127. The paster-shaft also carries another gear 136, smaller than the gear 127, from which the wrapper feeding and perforating rolls 85 and 86 are driven through an intermediate 133 at the rate of one revolution for each revolution of the driving-shaft 25, said rolls 85 and 86 being geared together by gears 134, with one of which the intermediate 133 meshes. An intermediate 135, meshing with the gear 124, drives the roll 88.

The gearing is properly timed, so that the various feeding-rolls and belts will bring the successive papers into proper positions to be acted upon by the folding-blades as they are advanced under control of the cams on the shaft 25 to properly associate the wrappers with the papers and to advance the paper and wrapper to the carrier at the proper time.

The operation of the machine as a whole will be readily understood from the foregoing description and need not be further set forth.

It will be understood that the features of the invention, as hereinafter set forth in the claims, may be embodied in machines differing widely from that shown and described for the purpose of illustrating the invention as embodied in a complete folding and wrapping machine and that the construction of the wrap-

ping mechanism may be varied without departing from the invention as claimed. It will be understood, also, that the devices described herein as employed for folding over the flap of the wrapper may be used also for folding a paper or other article not associated with a wrapper, and such use is within the invention.

While the invention has been described as especially applicable to wrapping newspapers and other publications, it will be understood that machines embodying the invention may be used for wrapping other articles for which it may be found applicable, and that such machines are within the claims, the term "paper" being used herein to include all articles and materials on which the machine is adapted to operate.

What is claimed is—

1. The combination of feeding devices, pressing and delivery devices, a carrier moving between the feeding devices and the pressing and delivery devices, and means for causing the carrier and the pressing and delivery devices to approach each other to carry the paper to and into the grasp of the pressing and delivery devices, substantially as described.

2. The combination of feeding devices, pressing and delivery devices, and a carrier moving between the feeding devices and the pressing and delivery devices, said carrier and said pressing and delivery devices having a movement of rotation whereby they are caused to approach each other to carry the paper to and into the grasp of the pressing and delivery devices, substantially as described.

3. The combination of feeding devices, pressing and delivery devices, a carrier moving between the feeding devices and the pressing and delivery devices, and means for causing the carrier and the pressing and delivery devices to approach each other as the carrier moves toward its delivery position to carry the paper to and into the grasp of the pressing and delivery devices, substantially as described.

4. The combination of feeding devices, pressing and delivery devices, and a carrier moving between the feeding devices and the pressing and delivery devices, said carrier and said pressing and delivery devices having simultaneous movements of rotation whereby they are caused to approach each other to carry the paper to and into the grasp of the pressing and delivery devices, substantially as described.

5. The combination of feeding devices, pressing and delivery devices, a pivoted carrier, means for oscillating the carrier between the feeding devices and the pressing and delivery devices, and means for moving the pressing and delivery devices simultaneously with the movement of the carrier in a line converging with the line of movement of the carrier, whereby the carrier and the pressing and delivery devices are caused to approach

each other to carry the paper to and into the grasp of the pressing and delivery devices, substantially as described.

6. The combination of feeding devices, pressing and delivery devices pivotally mounted, a pivoted carrier, and means for oscillating the carrier and the pressing and delivery devices to move them simultaneously toward a line extending between their centers of oscillation, substantially as described.

7. The combination of feeding devices, pressing and delivery rolls, and a carrier moving between the feeding devices and the pressing and delivery rolls, said carrier and said pressing and delivery rolls being mounted on shafts which carry intermeshing segmental gears whereby the carrier and the pressing and delivery rolls are oscillated to simultaneously move toward a line extending between said shafts, substantially as described.

8. The combination of a pair of feeding-rolls 11, 12, a pair of pressing and delivery rolls pivotally mounted, a pivoted carrier moving between the feeding-rolls and the pressing and delivery rolls and coacting with roll 12 to fold a sheet, means for oscillating the carrier and the pressing and delivery rolls to move them simultaneously toward a line extending between their centers of oscillation, and a guard extending from the roll 12 toward the point at which the paper is entered between the pressing and delivery rolls, substantially as described.

9. The combination with feeding devices and pressing and delivery devices, of a carrier formed of two sides *a*, *b* independently pivoted on a shaft 20, springs 30, 31 mounted on said shaft and bearing on the sides *a*, *b* respectively to move said sides toward each other, a stop 33 mounted on said shaft and extending between said sides, means for oscillating the stop 33 and the springs 30, 31 to cause the carrier to oscillate between the feeding devices and the pressing and delivery devices, backwardly-extending lugs 36, 38 on the sides *a*, *b*, and stationary abutments engaging one or the other of said lugs as the carrier approaches its receiving and delivery positions respectively, substantially as described.

10. The combination with feeding devices and pressing and delivery devices, of a carrier formed of two sides *a*, *b* independently pivoted on a shaft 20 and under yielding tension to move toward each other, a stop extending between said sides, means for moving the stop to cause the carrier to oscillate between the feeding devices and the pressing and delivery devices, backwardly-extending lugs 36, 38 on the sides *a*, *b*, and stationary abutments engaging one or the other of said lugs as the carrier approaches its receiving and delivery positions respectively, substantially as described.

11. The combination with feeding devices

and pressing and delivery devices, of a carrier formed of two sides *a*, *b* independently pivoted on a shaft 20 and under yielding tension to move toward each other, a stop extending between said sides, means for moving the stop to cause the carrier to oscillate between the feeding devices and the pressing and delivery devices, and stationary abutments acting to stop the movement of one or the other of said sides *a*, *b* as the carrier approaches its receiving and delivery positions respectively, substantially as described.

12. The combination with feeding devices and pressing and delivery devices, of a pivoted carrier having sides under yielding tension to move toward each other, means for oscillating the carrier between the feeding devices and the pressing and delivery devices, means for moving the pressing and delivery devices simultaneously with the movement of the carrier to cause the carrier and the pressing and delivery devices to gradually approach each other while moving in the same general direction to carry the paper to and into the grasp of the pressing and delivery devices, and abutments engaging one or the other of the sides of the carrier as the carrier approaches its receiving and delivery positions respectively, substantially as described.

13. The combination with feeding devices and pressing and delivery devices, of a pivoted carrier having sides under yielding tension to move toward each other, means for oscillating the carrier between the feeding devices and the pressing and delivery devices, means for moving the pressing and delivery devices simultaneously with the movement of the carrier to cause the carrier and the pressing and delivery devices to gradually approach each other while moving in the same general direction to carry the paper to and into the grasp of the pressing and delivery devices, and means for moving one or the other of the sides of the carrier against the tension under which said sides tend to move toward each other to open the carrier as the carrier approaches its receiving and delivery positions respectively, substantially as described.

14. The combination with feeding devices and pressing and delivery devices, of a pivoted carrier having one of its sides under yielding tension to move toward the other side, means for oscillating the carrier between the feeding devices and the pressing and delivery devices, means for moving the pressing and delivery devices simultaneously with the movement of the carrier to cause the carrier and the pressing and delivery devices to gradually approach each other while moving in the same general direction to carry the paper to and into the grasp of the pressing and delivery devices, and means for moving said side against the tension under which said side tends to move toward the other side to open the carrier as the carrier approaches its receiving position, substantially as described.

15. The combination with feeding devices and pressing and delivery devices, of a pivoted carrier having one of its sides under yielding tension to move toward the other side, means for oscillating the carrier between the feeding and the pressing and delivery devices, means for moving the pressing and delivery devices simultaneously with the movement of the carrier to cause the carrier and the pressing and delivery devices to gradually approach each other while moving in the same general direction to carry the paper to and into the grasp of the pressing and delivery devices, and means for moving the said side of the carrier against the tension under which said side tends to move toward the other side to open the carrier as the carrier approaches its delivery position, substantially as described.

16. The combination with feeding devices and pressing and delivery devices, of a carrier having sides under yielding tension to move toward each other, a reciprocating member extending between the sides of the carrier and engaging one or the other of said sides to give the carrier a reciprocating movement, and stationary abutments engaging one or the other of said sides of the carrier as the carrier approaches its receiving and delivery positions respectively, substantially as described.

17. The combination of feeding devices, pressing and delivery rolls 13, 14 mounted on a shaft 15, a carrier formed of two sides *a*, *b* independently pivoted on a shaft 20 and under yielding tension to move toward each other, a member mounted on said shaft 20 having a segmental gear meshing with a gear on the shaft 15, and a stop 33 carried by said member and extending between the sides *a*, *b*, substantially as described.

18. The combination of feeding devices, pressing and delivery rolls 13, 14 mounted on a shaft 15, a carrier formed of two sides *a*, *b* independently pivoted on a shaft 20 and under yielding tension to move toward each other, a member mounted on said shaft 20 having a segmental gear meshing with a gear on the shaft 15, a stop 33 carried by said member and extending between the sides *a*, *b*, and stationary abutments engaging one or the other of said sides *a*, *b* as the carrier approaches its receiving and delivery positions respectively, substantially as described.

19. The combination with a pivoted carrier having sides *a*, *b*, under yielding tension to move toward each other, of feeding-roll 40 extending through openings in one of the sides of the carrier when the carrier is in position to receive a paper, roll 41 mounted on the other side of the carrier to coact with the roll 40, and means for moving one or the other of the sides of the carrier to open the carrier for receiving and delivering, substantially as described.

20. The combination with a carrier formed of two sides *a*, *b* independently pivoted on a

shaft 20, of springs 30, 31, and stop 33, substantially as described.

21. The combination with a pivoted carrier having sides *a*, *b* under yielding tension to move toward each other, of stop 33, backwardly-extending lugs 36, 38, and abutments 37, 39, substantially as described.

22. The combination with a carrier pivoted on a shaft 20 and having sides *a*, *b* under yielding tension to move toward each other,

of a gear mounted on the shaft 20, and stop 33 carried by said gear, substantially as described.

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

LUTHER C. CROWELL.

Witnesses:

C. J. SAWYER,
A. L. KENT.