

No. 616,291.

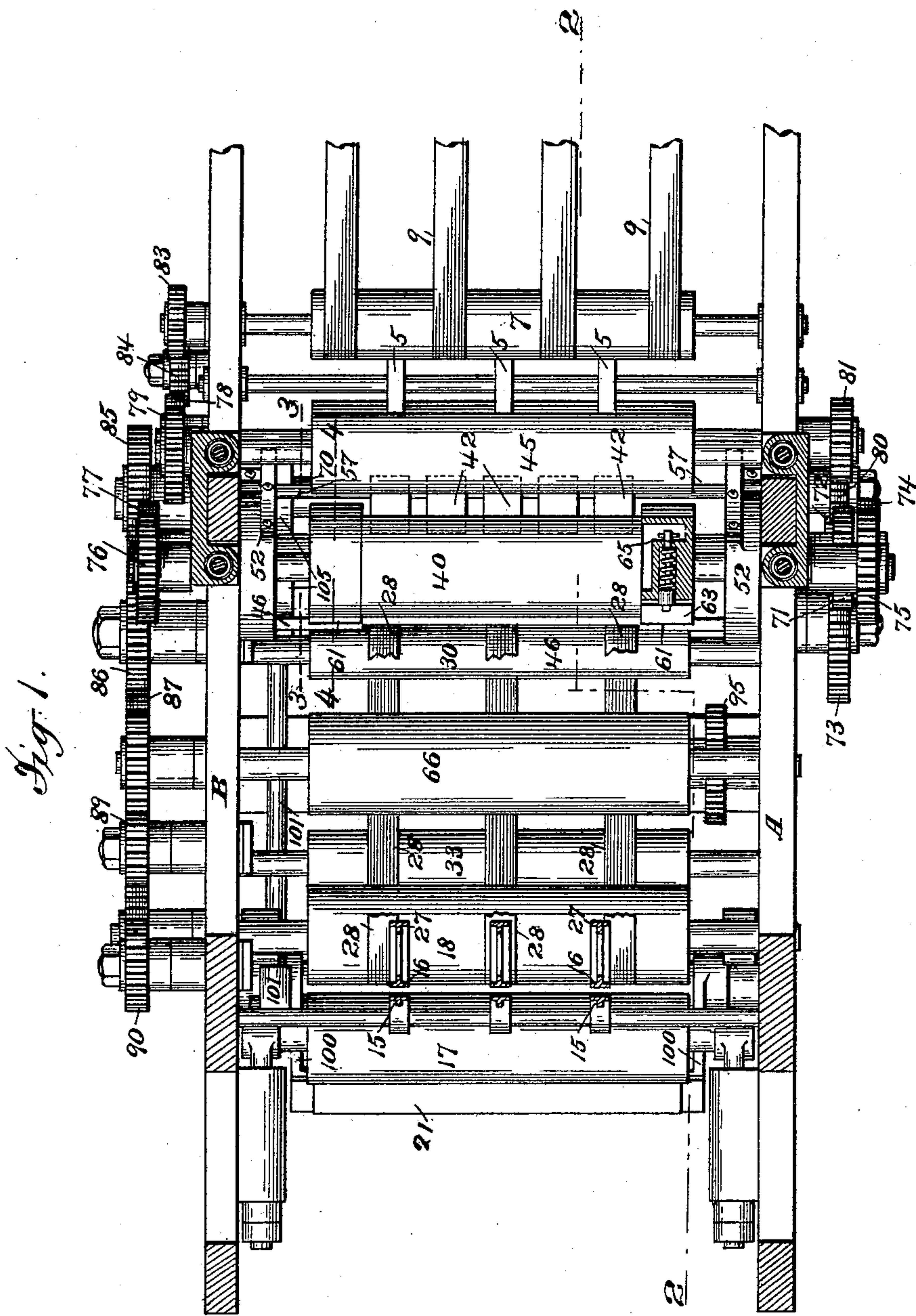
Patented Dec. 20, 1898.

L. C. CROWELL.
WRAPPING MACHINE.

(Application filed May 13, 1897.)

(No Model.)

4 Sheets—Sheet 1.



Attest.
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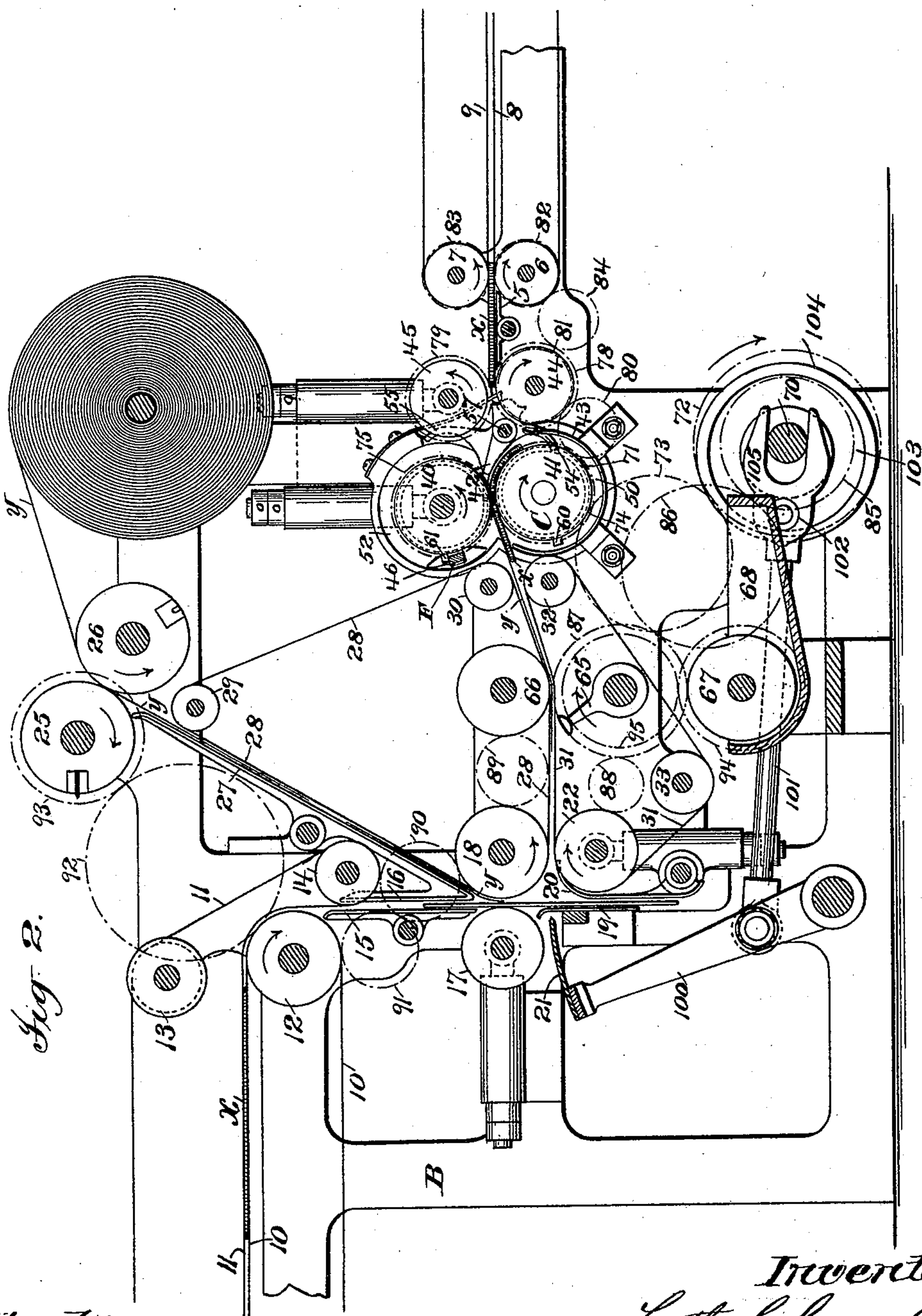


Fig. 2.

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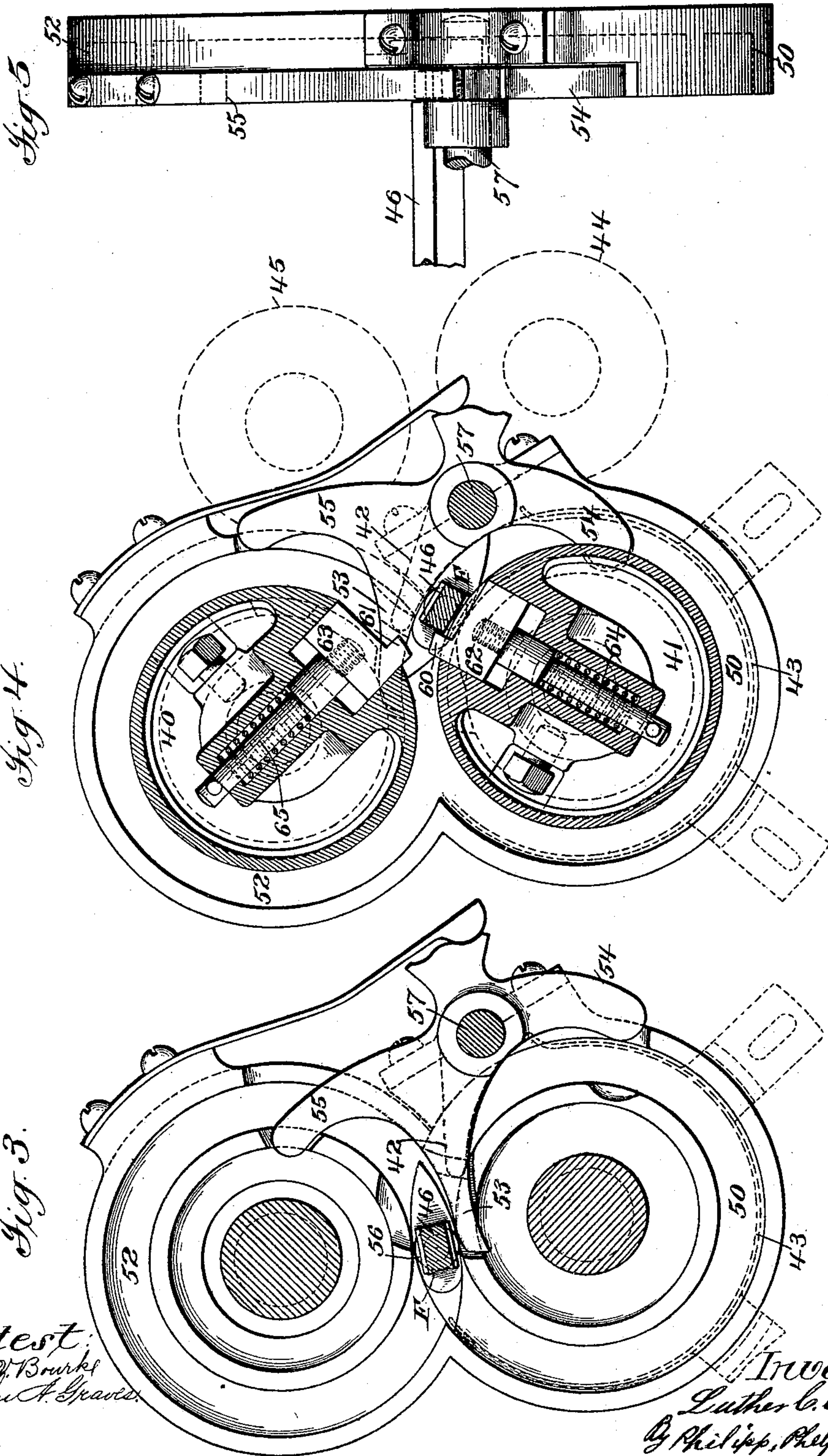
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4 Sheets—Sheet 3.



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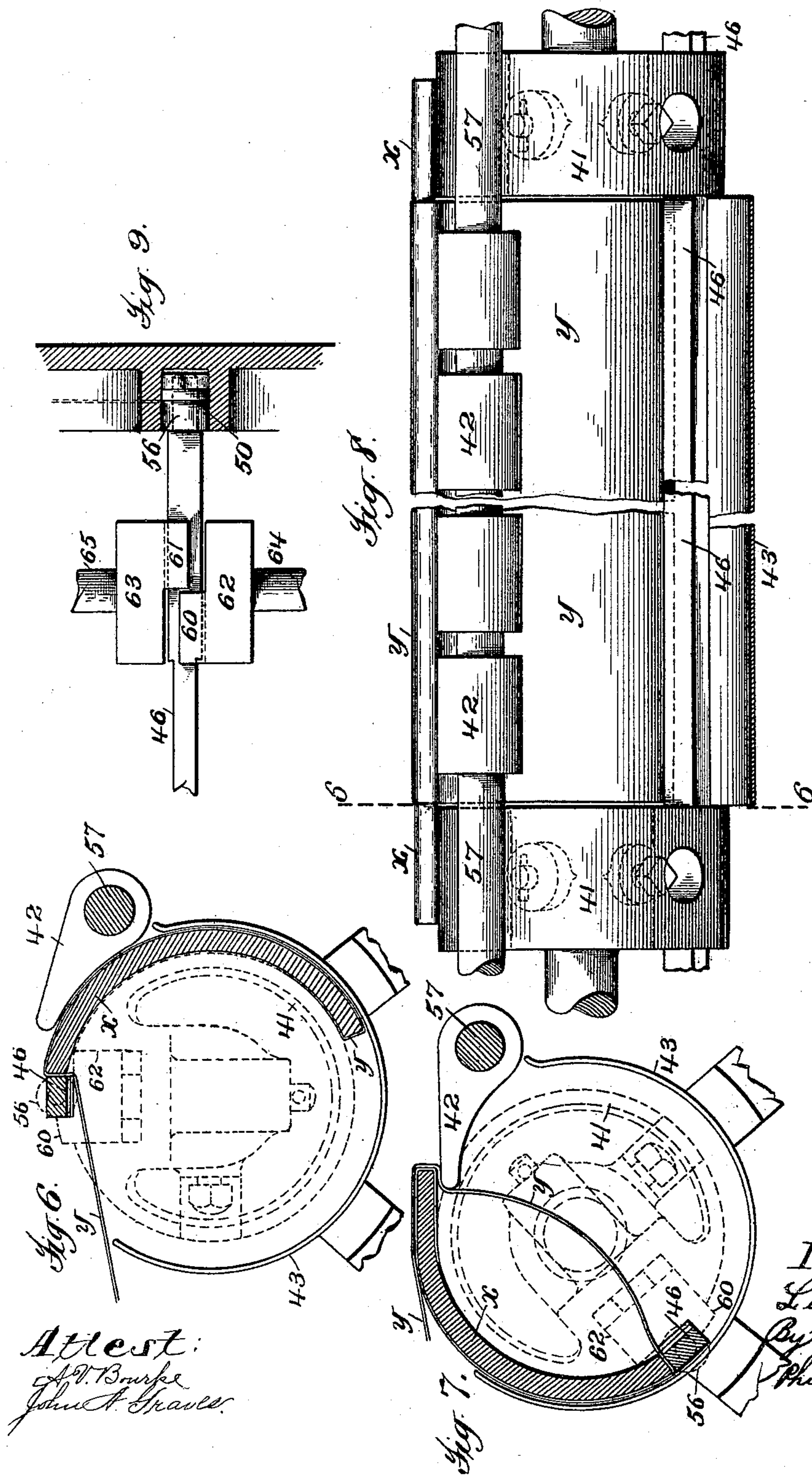
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4 Sheets—Sheet 4.



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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.

WRAPPING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 616,291, dated December 20, 1898.

Application filed May 13, 1897. Serial No. 636,309. (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
5 of New York, have invented certain new and useful Improvements in Wrapping-Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

10 This invention relates to machines of that class used in wrapping newspapers and other publications for mailing and generally known as "newspaper-wrapping" machines.

The invention aims especially to provide
15 an improved machine for carrying out the method of wrapping such publications described and claimed in Patent No. 522,197, granted to me July 3, 1894, according to which method the paper and wrapper are rolled into
20 a cylindrical form having a circumference greater than the length of the paper and the paper and wrapper then led from the rolling-space by their leading ends, with the rear end of the wrapper overlapping upon a layer of
25 wrapper upon the paper.

The invention relates particularly to means for rolling the paper and wrapper into cylindrical form, whereby the paper and wrapper having been fed to the wrapping devices and
30 being controlled by suitable guides are advanced positively in a circular path, so as to wind the wrapper about the paper by being pushed forward by means engaging the rear end of the paper.

35 In carrying the invention into practice I provide a guiding-casing of any suitable construction to guide the paper and wrapper in a circular path as they are advanced under the action of a follower formed, preferably,
40 of a rod or bar extending longitudinally of the casing and mounted to rotate concentrically with the casing. A cylindrical core is preferably provided inside the casing of less length than the width of the paper to be
45 wrapped, so that the wrapper occupying the space on the paper which is not supported by the core will not interfere with the leading off of the paper and wrapper after they have been wound about the core. The core is pref-
50 erably formed by two short cylinders mount-

ed so as to engage the paper near its side edges and to leave the middle portion of the paper on which the wrapper is applied unsupported, so as to leave the space about which the wrapper is rolled unobstructed. 55 The rolls forming the core are preferably rotatable, and a feeding-roll is preferably provided to coact with the rolls forming the core to engage the paper and wrapper as they are fed to the core and advance them to bring 60 the rear end of the paper in position to be engaged by the follower.

For the purpose of leading off the paper and wrapper from the core with the rear end of the wrapper overlapping upon a layer of 65 wrapper on the paper, in accordance with the method of wrapping of the patent above referred to, I preferably provide a switch which is moved into position on the second rotation of the core to guide the leading end of the 70 paper and wrapper to suitable feeding and pressing devices, by which the flap of the wrapper is pressed down upon the layer of wrapper on the paper and secured by paste previously applied to the flap of the wrapper or to 75 the layer of wrapper on the paper, the switch also acting to carry the part of the wrapper not supported by the paper in, so as to lie against the paper.

The wrapper extending behind the paper 80 and being on the side of the paper away from the core, it is evident that if the follower were caused to engage the rear end of the paper from the inside while advancing in its path about the core it would be inside the wrap- 85 per, and thus prevent the leading off of the wrapped paper from the wrapping-space. To avoid this difficulty, the follower, after advancing the paper once about the core, is caused to move during the next rotation of 90 the core, so as to be brought into position to engage the rear end of the succeeding paper from the outside. In carrying out this idea I preferably provide means whereby during each second rotation of the core the follower 95 will be guided about the feeding-roll coacting with the core, the preferred means for securing this result being hereinafter fully described.

My improved wrapping mechanism may be 100

embodied in a machine designed merely to wrap papers which have been previously folded to the proper size for wrapping, suitable feeding mechanism being provided for feeding the papers to the wrapping mechanism in time and suitable wrapper feeding and pasting mechanism being also preferably provided, so as to form a complete automatic machine, or the wrapping mechanism may be combined with folding mechanism of any suitable kind for folding and wrapping or completing the folding of partially-folded papers, so as to produce a complete newspaper folding and wrapping machine.

A full understanding of the invention can best be given by a detailed description of a construction embodying the same in the preferred form, and such a description will now be given in connection with the accompanying drawings, in which—

Figure 1 is a plan view of a wrapping-machine embodying all the features of the invention. Fig. 2 is a sectional view taken on line 2 of Fig. 1. Fig. 3 is an enlarged detail view of the wrapping mechanism, taken on line 3 of Fig. 1, but with the position of the parts changed. Fig. 4 is a similar view taken on line 4 of Fig. 1. Fig. 5 is an end view of the parts shown in Fig. 3. Fig. 6 is a detail diagrammatic and sectional view taken on line 6 of Fig. 8, the parts being shown in position just after the follower has moved into engagement with the rear end of the paper. Fig. 7 is a similar view taken on line 6 of Fig. 8, with the parts in position just as the leading ends of the paper and wrapper after the first revolution of the core are being led off to the pressing devices. Fig. 8 is a detail rear end view showing the parts in position, as in Fig. 7. Fig. 9 is a detail of parts which will be hereinafter described.

Referring to the drawings, the various parts of the machine shown are supported in a frame formed in any suitable manner, as of the sides A B. The machine will be described by following the course of the paper and wrapper from the time they are fed into the machine to the delivery of the wrapped paper from the machine.

The papers x are fed into the machine between feeding-tapes 10 and 11, the tapes 10 turning on a feeding-roll 12 and tapes 11 turning on roll 12 and on rolls 13 and 14, the roll 14 being located beyond and below the roll 12, so that the papers as they are fed in between the horizontal portions of the tapes will be turned downwardly about the roll 12 and then advanced downwardly between guides 15 and 16 and between a pair of feeding-rolls 17 and 18, the roll 17 being preferably spring-seated, as shown. Below the rolls 17 and 18 the papers are fed downward between vertical guides 19 and 20, across the path of a reciprocating folding-blade 21, by which the paper, being fed to the proper position, is engaged at its middle point and its folded edge carried between the feeding-roll 18 and another feeding-

roll 22, beneath the roll 18, this roll 22 being also preferably spring-seated, as shown.

The wrapper-web y is fed into the machine by means of feeding and cutting rolls 25 and 26 from a wrapper-web roll mounted on bearings in the upper forward part of the frame. From the feeding and cutting rolls the wrappers are advanced downwardly between a guide 27 and feeding-tapes 28, turning on a roll 29, located near the roll 26, and also turning about the feeding-roll 18. The wrappers are thereby further fed downwardly and associated with the papers as they are advanced between the rolls 18 and 22, the parts being properly timed, so that preferably the forward edge of the wrapper will extend somewhat past the middle line of the paper in order that as the paper is folded by the blade 21 between the rolls 18 and 22 the folded edge of the paper will enter between the rolls with the wrapper overlapping its folded edge. The wrappers are cut to such a length that when thus associated with the paper the rear end of the wrapper will extend behind the paper a distance approximating twice the length of the folded paper as it is fed between the rolls. From the rolls 18 and 22 the paper and wrapper are advanced between the tapes 28, which from the roll 18 pass to a roll 30, and tapes 31, passing around the roll 22 and a roll 32 beneath the roll 30, the tapes 31 also preferably turning on a roll 33 for the purpose of preventing their interfering with the paster-shaft hereinafter described. From the feeding-tapes 28 and 31 the papers and wrappers pass to the wrapping mechanism proper. The forward end of the paper and wrapper is received between a roll 40 and a core C, formed of two short cylinders 41, having their axes in the same line and positioned so as to engage the edges of the paper beyond the edges of the wrapper, the space inclosed by the wrapper in the operation of wrapping being thus left free to permit of the paper and wrapper being led off from the core, as hereinafter described. The paper and wrapper are then fed forward by the core and feeding-roll 40 and are guided about the core by a casing formed by the lower surface of a switch 42 and then by a guide 43, extending concentrically about the core and formed, preferably, of a curved plate, as shown, but which may be formed of curved strips or of belts or of a series of parallel rolls or in any other suitable manner. As the rear end of the paper comes between the core and the feeding-roll 40 it is, as shown in Fig. 6, engaged by a follower F, which moves concentrically about the core and which as the paper passes out of the grip of the core and the feeding-roll 40 pushes the rear end of the paper, and thus advances the paper and wrapper about the core, the paper being prevented from buckling and guided in a circular path by the guide 43 and the core. Before the front end of the paper and wrapper reaches the switch 42 on the second revolution of the core the switch is

moved, as hereinafter described, from the position shown in Figs. 2 and 6 to the position shown in Fig. 7, and the front end of the paper and wrapper will thereby be guided off from the core and between feeding-rolls 44 and 45, the switch also acting to fold the free portion of the wrapper inwardly against the paper and the rolls 44 and 45 pressing down the flap of the wrapper, so as to cause it to be secured by paste previously applied.

The follower F is formed, preferably, of a bar or rod 46, extending parallel with the axis of the core and guided so as to move concentrically about the core inside the guide 43, and for this purpose the rod 46 is extended beyond the ends of the core, and its ends move in circular guideways 50, concentric with the axis of the core.

It is desirable, as before stated, that the follower engage the rear end of the paper from the outside, and for this purpose the follower is caused at every second revolution to move about the roll 40, guideways 52, similar to the guideways 50, being provided for guiding the ends of the bar 46 in its path about the roll 40.

The guideways 50 and 52 at each end of the wrapping mechanism intersect midway between the axes of the roll 40 and the core, as is clearly shown in Fig. 3, so that when the follower is between the core and the roll 40 it may in its further movement be caused to move about the core with its ends in the guideways 50 or about the roll 40 with its ends in the guideways 52. For the purpose of determining which course the follower shall take a pivoted switch 53 is provided for each end of the follower. Each of these switches 53 carries an arm 54 so positioned that when the switches are in position to guide the ends of the follower into the guideways 50 the arms 54 will extend into the path of the follower and be engaged thereby as it advances about the core, whereby the switch will be moved from the position shown in Fig. 4 into position, as shown in Fig. 3, to direct the ends of the follower on the next revolution of the core into the guideways 52. When the switches are in this position, arms 55, similar to the arms 54, extend into the path of the follower in its movement about the roll 40 and are thrown by the follower as it moves about the roll 40 to move the switches back to the position shown in Fig. 4. For the purpose of diminishing the friction in the operation of these parts the bar 46 is preferably provided with antifriction-rolls 56 in position to engage the arms 54 and 55 of the switches 53. It will thus be seen that the switches 53 will be alternately in position to guide the follower into its path about the core and about the roll 40. The paper and wrapper switch 42 is conveniently operated by being mounted on the shaft 57 of the follower-switches 53.

The follower F is driven by means of pushers 60 and 61, carried by the cylinders 41 and the feeding-roll 40, respectively, these push-

ers being formed by lugs projecting beyond the periphery of said cylinders 41 and roll 40 from blocks 62 and 63, carried by spring-seated rods 64 and 65, respectively. The cylinders 41 and the roll 40 are so positioned on their shafts that the pushers 60 and 61 will simultaneously approach the line extending between the centers of the cylinders 41 and the roll 40, so that the follower being advanced between the roll and the cylinders 41—as, for example, by the pusher 61—after having followed its course about the roll 40 will be advanced by the pusher 60 in its course about the core. Then on the next revolution it will again be taken in hand by the pusher 61 for its next revolution about the roll 40. The pushers 60 and 61 on each side of the machine are cut away from opposite sides, as shown in Fig. 9, so that they will not interfere with each other when between the core and roll 40.

The wrapped papers are advanced from the rolls 44 and 45 over guides 5 between feeding-rolls 6 and 7, from which they are advanced by delivery-tapes 8 and 9.

The machine shown in the drawings is arranged to apply a line of paste to the rear end of the wrapper before it reaches the wrapping mechanism proper. For this purpose a rotating paster 65 is provided to coact with a roll 66, this paster being cut away so as to apply paste only between the tapes 31. Paste is supplied to the paster 65 by a roll 67, mounted to rotate in a fountain 68.

The various moving parts of the machine are driven from a main driving-shaft 70 as follows: The shaft of one of the cylinders 41 carries a gear 71, which is driven from a gear 72 on the driving-shaft 70 through an intermediate 73. The shaft of this cylinder 41 also carries a gear 74, which meshes with a similar gear 75 on the shaft of the feeding-roll 40. The other cylinder 41, forming the other end of the core, is driven from the roll 40 by a gear 76 similar to the gear 75, which meshes with a gear 77 on the shaft of this cylinder 41, similar to the gear 74. The feeding-rolls 44 and 45 carry intermeshing gears 78 and 79 and are driven from the gear 71 through an intermediate 80, meshing with a gear 81 on the shaft of the roll 44. The rolls 6 and 7 carry intermeshing gears 82 and 83 and are driven from the gear 78 through an intermediate 84. The shaft 70 also carries another gear 85, with which meshes an intermediate 86, also meshing with a gear 87 on the shaft of the paster 65. From this gear 87 the feeding rolls and tapes by which the papers and wrappers are fed into the machine and to the wrapping mechanism proper are driven as follows: The feeding-roll 22 is driven from the gear 87 through an intermediate 88. The feeding-roll 18 is driven by an intermediate 89 from the roll 66, which in turn is driven from the gear 87. The roll 12 is driven through intermediates 90 and 91 from the roll 18, the intermediate 90 also driving the roll

14. The feeding and cutting rolls 25 and 26 carry intermeshing gears and are driven from the roll 12 through an intermediate 92, meshing with a gear 93 on the shaft of the roll 25, said gear 93 being of greater diameter than the roll 25 to cause the rolls 25 and 26 to feed the wrappers at a slower rate than that at which they are afterward fed through the machine, so that the wrappers as they come into position to be associated with the papers will be the desired distance apart. The paste-roll 67 carries a gear 94, meshing with a gear 95 on the shaft of the paster 65.

The various feeding-rolls are timed so as to associate the wrappers with the papers in the manner before described and to advance a paper with a wrapper turned about its leading end to the wrapping mechanism at alternate revolutions of the core.

The folding-blade 21 is carried by pivoted arms 100 and is actuated by means of a pitman 101, pivoted to one of the arms 100 and carrying at its other end a bowl 102, riding in a cam-groove 103 in a disk 104, carried by the driving-shaft 70, the end of the pitman 101 beyond the bowl 102 being provided with a guiding-fork 105, the prongs of which extend each side of the shaft 70.

It will be understood that I am not to be limited to the exact construction of the machine selected for the purpose of illustrating the invention and shown in the drawings and to which the foregoing description has been mainly confined, but that the mechanism for carrying out the invention as defined in the claims may be changed in many ways, as will be evident to those skilled in the art, and that wrapping mechanism embodying the invention may be combined with other cooperating mechanisms as may be found desirable and practicable, as will be understood from the first part of the specification.

While the invention has been described as applied to wrapping newspapers and other publications, it will be understood that machines embodying my invention may be used for wrapping other articles which can be rolled into cylindrical form and that such uses are within the invention, and that the term "paper" as used in the claims is intended to include such other articles.

What I claim is—

1. The combination with a cylindrical casing, of a follower for pushing a paper and wrapper circumferentially within the casing to wind the wrapper about the paper, and means for delivering the paper and wrapper thereon from the casing, substantially as described.

2. The combination with a cylindrical casing, of a follower for pushing the paper and wrapper circumferentially within the casing to wind the wrapper about the paper, and devices by which the paper and wrapper are led from the casing with the rear end of the wrapper overlapping a layer of wrapper upon the paper and the overlapping portion of the

wrapper pressed down for pasting, substantially as described.

3. The combination of a core of less length than the width of the paper to be wrapped, a follower arranged to move in a path extending about the core in engagement with the rear end of the paper, means for guiding the paper and wrapper in a path extending about the core, and means for delivering the paper and wrapper thereon from the core, substantially as described.

4. The combination of a core of less length than the width of the paper to be wrapped, a follower arranged to move in a path extending about the core in engagement with the rear end of the paper, a casing extending about the core, feeding and pressing devices by which the paper and wrapper are delivered from the core and the wrapper pressed down upon the paper for pasting, and a switch operating to guide the leading end of the paper and wrapper in a path extending about the core during the first rotation of the follower and to guide the leading end of the paper and wrapper from the core to the feeding and pressing devices on the next rotation of the follower, substantially as described.

5. The combination of a rotary core of less length than the width of the paper to be wrapped, a follower arranged to move in a path extending about the core in engagement with the rear end of the paper, a casing extending about the core, feeding and pressing devices by which the paper and wrapper are delivered from the core and the wrapper pressed down upon the paper for pasting, and a switch operating to guide the leading end of the paper and wrapper in a path extending about the core during the first rotation of the core and follower and to guide the leading end of the paper and wrapper from the core to the feeding and pressing devices on the next rotation of the core and follower, substantially as described.

6. The combination of a rotary core of less length than the width of the paper to be wrapped, a feeding-roll coacting with the core to advance the paper and wrapper as they are fed between the core and the feeding-roll, a follower arranged to move in a path extending about the core and to engage the rear end of the paper as it passes between the feeding-roll and the core, a casing extending about the core, and devices by which the paper and wrapper are led from the casing with the rear end of the wrapper overlapping a layer of wrapper upon the paper and the overlapping portion of the wrapper pressed down for pasting, substantially as described.

7. The combination of a rotary core of less length than the width of the paper to be wrapped, a feeding-roll coacting with the core to advance the paper and wrapper as they are fed between the core and the feeding-roll, a follower arranged to move alternately in a path extending about the core and in a path extending about the feeding-roll and to en-

gage the rear end of the paper as it passes between said feeding-roll and the core, a casing extending about the core, and devices by which the paper and wrapper are led from the casing with the rear end of the wrapper overlapping a layer of wrapper upon the paper and the overlapping portion of the wrapper pressed down for pasting, substantially as described.

8. The combination of a rotary core of less length than the width of the paper to be wrapped, a feeding-roll coacting with the core to advance the paper and wrapper as they are fed between the core and the feeding-roll, a follower arranged to move in a path extending about the core and to engage the rear end of the paper as it passes between said feeding-roll and the core, a casing extending about the core, feeding and pressing devices by which the paper and wrapper are delivered from the core and the wrapper pressed down upon the paper for pasting, and a switch operating to guide the leading end of the paper and wrapper in a path extending about the core during the first rotation of the follower and to guide the leading end of the paper and wrapper from the core to the feeding and pressing devices on the next rotation of the core and follower, substantially as described.

9. The combination of a rotary core of less length than the width of the paper to be wrapped, a feeding-roll coacting with the core to advance the paper and wrapper as they are fed between the core and the feeding-roll, a follower arranged to move alternately in a path extending about the core and in a path extending about the feeding-roll and to engage the rear end of the paper as it passes between said feeding-roll and the core, a casing extending about the core, feeding and pressing devices by which the paper and wrapper are delivered from the core and the wrapper pressed down upon the paper for pasting, and a switch operated by the alternate movements of the follower about the core and about the feeding-roll and operating to guide the leading end of the paper and wrapper in a path extending about the core during the first rotation of the follower and to guide the leading end of the paper and wrapper from the core to the feeding and pressing devices on the next rotation of the follower, substantially as described.

10. The combination of a core, a casing extending about the core, and a follower arranged to move alternately in a path extending about the core inside the casing and in a path exterior to the casing, substantially as described.

11. The combination of a core, a casing extending about the core, a follower arranged to move alternately in a path extending about the core inside the casing and in a path exterior to the casing, and a switch 42 controlled by the movement of the follower, substantially as described.

12. The combination of a core, a casing ex-

tending in a path extending about the core, and a follower mounted to move about the core inside the casing, substantially as described.

13. The combination of a core, a casing extending about the core, a follower formed of a rod or bar 46, and means for guiding the rod or bar 46 in a path extending about the core inside the casing and parallel with the axis of the core, substantially as described.

14. The combination of a core, a casing extending about the core, a follower formed of a rod or bar 46, guideways 50 concentric with the core for the ends of the rod 46, and pushers 60 for advancing the rod 46 about the core, substantially as described.

15. The combination of a core formed of two rotary cylinders 41, a casing extending about the core, a follower F, means for guiding the follower with the core, and pushers 60 carried by the cylinders 41, substantially as described.

16. The combination with a core and a casing extending about the core, of the follower F, substantially as described.

17. The combination with a rotary core and a feeding-roll 40, of a follower F, intersecting guideways 50 and 52 for the follower, and a switch 53 determining the course of the follower, substantially as described.

18. The combination with a core and a feeding-roll 40, of a follower F, intersecting guideways 50 and 52 for the follower, a switch 53, and means for operating said switch to direct the follower alternately into the guideways 50 and the guideways 52 respectively, substantially as described.

19. The combination with a core and a feeding-roll 40, of a follower F, intersecting guideways 50 and 52 for the follower, and a switch 53 determining the course of the follower, said switch having arms 54 and 55 extending into the path of the follower whereby the switch is actuated by the movement of the follower to direct the follower alternately with the core and the roll 40, substantially as described.

20. The combination of a cylindrical casing, a follower F, guideways 50 for the follower concentric with the casing, guideways intersecting with the guideways 50, and a pivoted switch 53 determining the course of the follower and controlled by the movement of the follower, substantially as described.

21. The combination of a cylindrical casing, a follower F, guideways 50 for the follower concentric with the casing, guideways intersecting with the guideways 50, a pivoted switch 53 determining the course of the follower, and controlled by the movement of the follower, and a switch 42 moving with the switch 53, 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,

T. F. KEHOE.