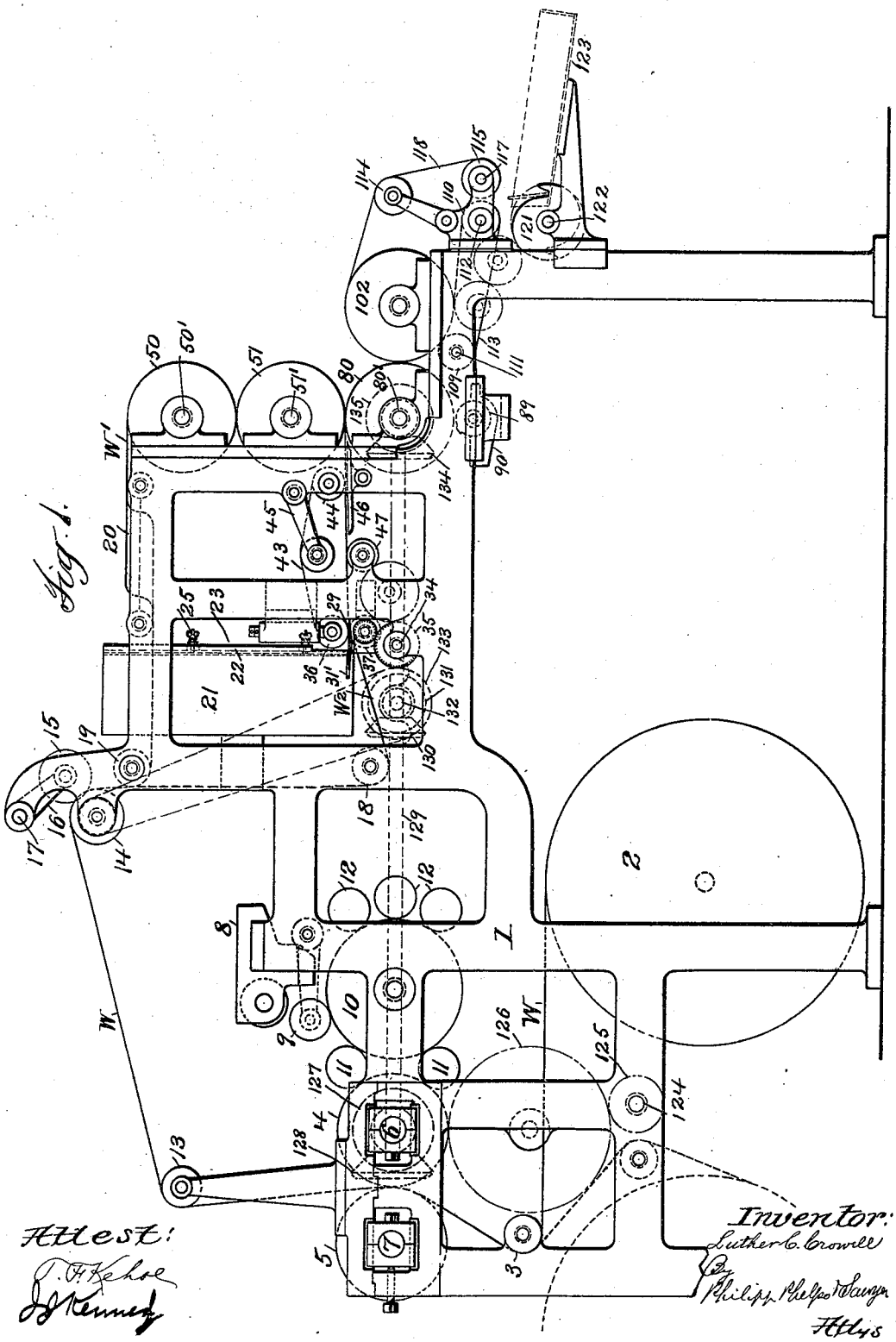
No. 649,161. Patented May 8, 1900.

L. C. CROWELL.

FOLDING MACHINE.

(Application filed July 25, 1899.)

(No Model.) 6 Sheets—Sheet 1.



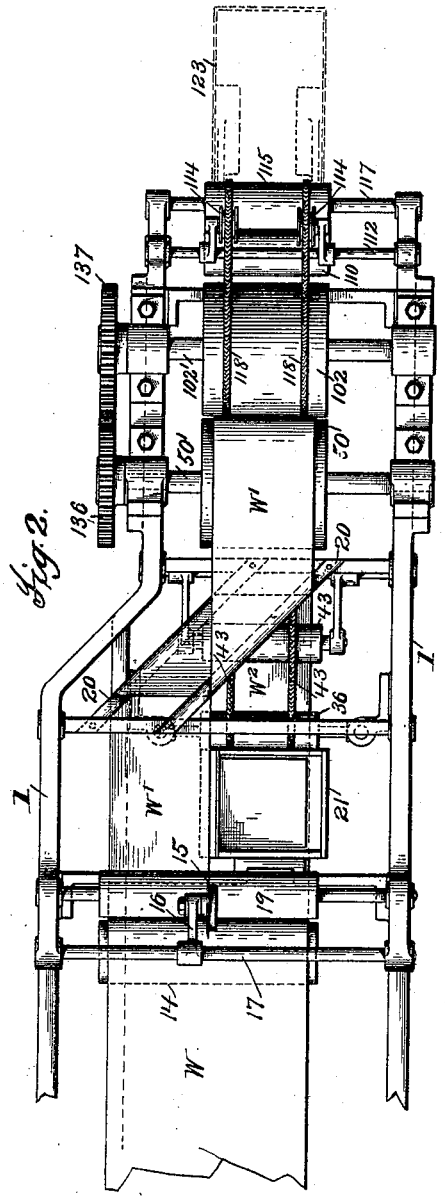
No. 649,161. Patented May 8, 1900.

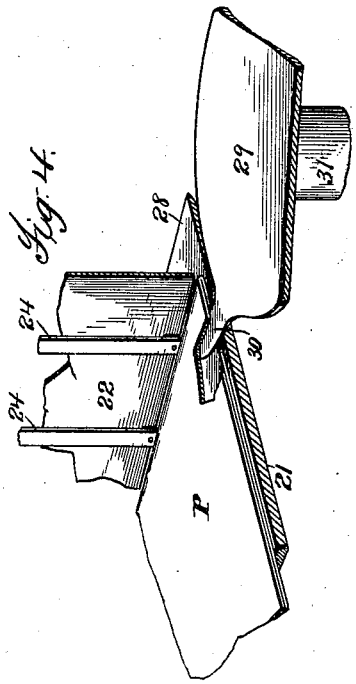
L. C. CROWELL.

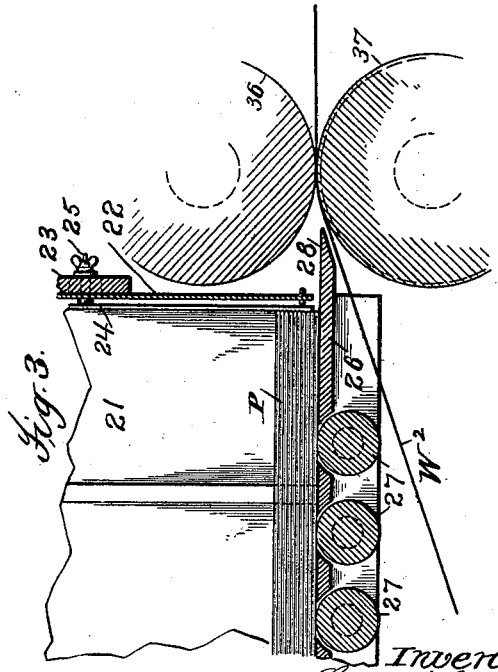
FOLDING MACHINE.

(Application filed July 25, 1899.)

(No Model.) 6 Sheets—Sheet 2.







Attest:
T. F. Kehoe
J. H. Emmert

Inventor
Lester C. Crowell
By Philipp, Phelps & Sawyer
Attys.

No. 649,161. Patented May 8, 1900.

L. C. CROWELL.

FOLDING MACHINE.

(Application filed July 25, 1899.)

(No Model.) 6 Sheets—Sheet 3.

Fig. 6.

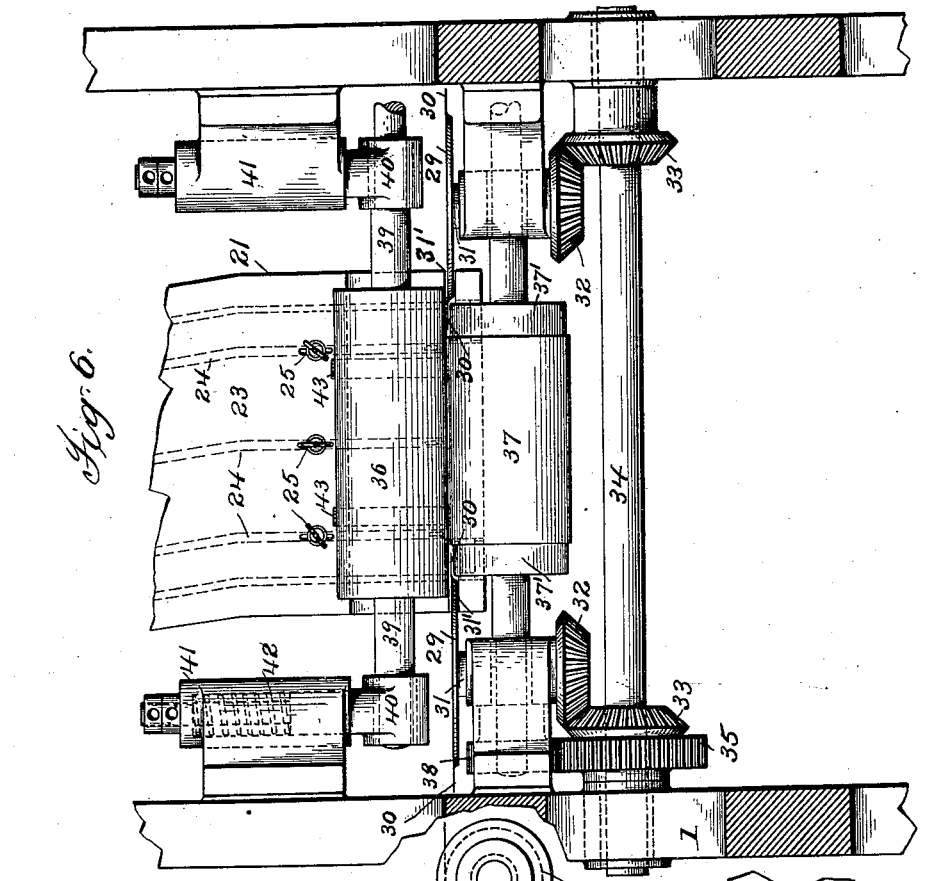
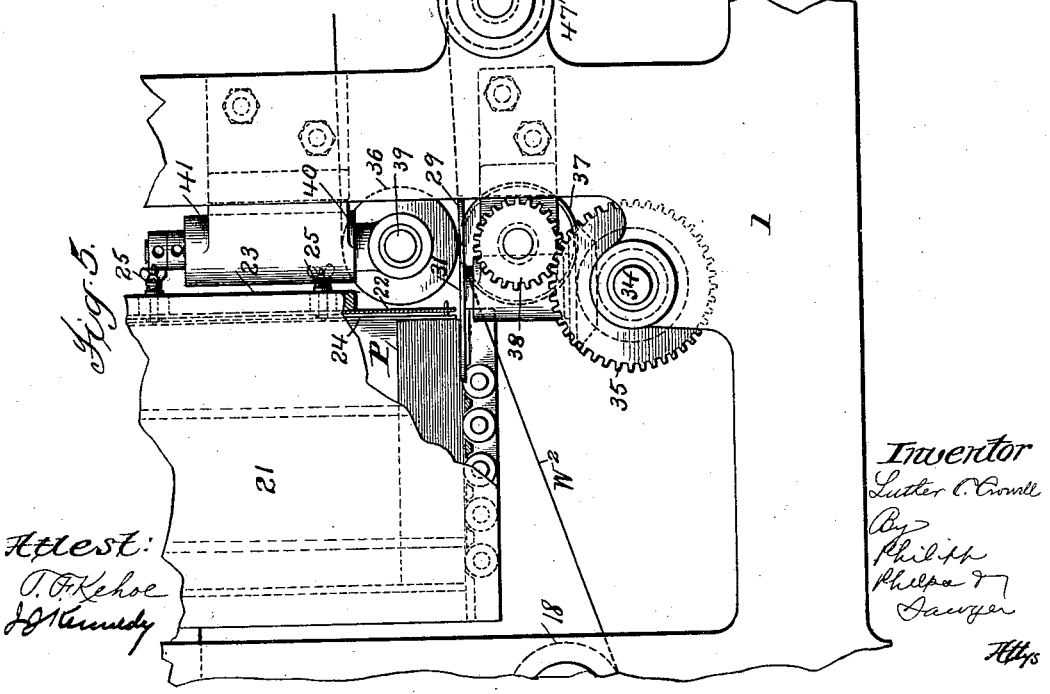


Fig. 5.



Witnesses:
T. F. Kehoe
J. J. Kennedy

Inventor
Luther C. Crowell
By Philipp Philipp & Sawyer
Attys

No. 649,161. Patented May 8, 1900.

L. C. CROWELL.

FOLDING MACHINE.

(Application filed July 25, 1899.)

(No Model.) 6 Sheets—Sheet 4.

Fig. 8.

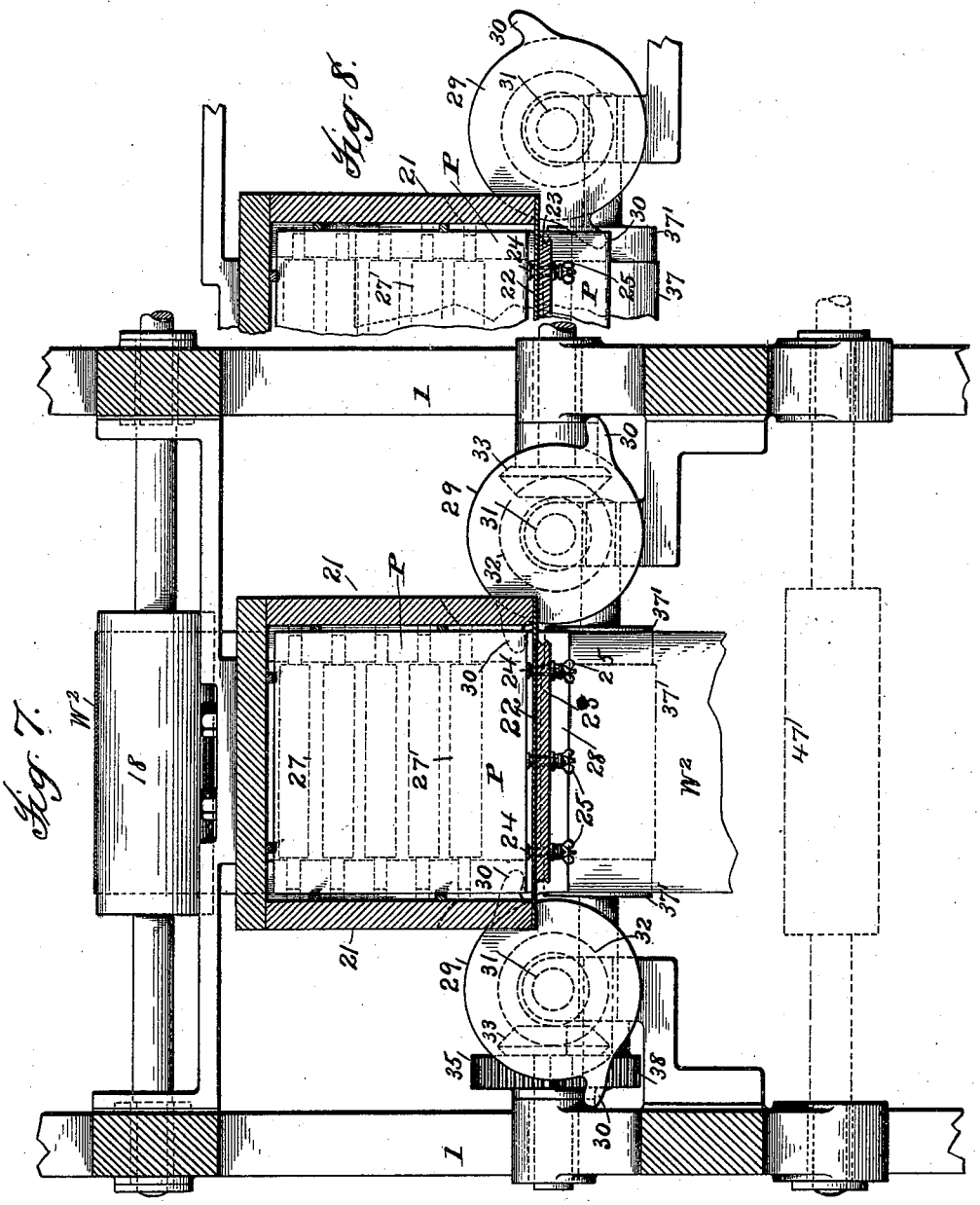


Fig. 7.

Witnesses:
T. F. Kehoe
J. J. Kennedy

Inventor:
Luther C. Crowell
By Philipp Philipp & Sawyer
Attys.

No. 649,161. Patented May 8, 1900.

L. C. CROWELL.

FOLDING MACHINE.

(Application filed July 25, 1899.)

(No Model.) 6 Sheets—Sheet 5.

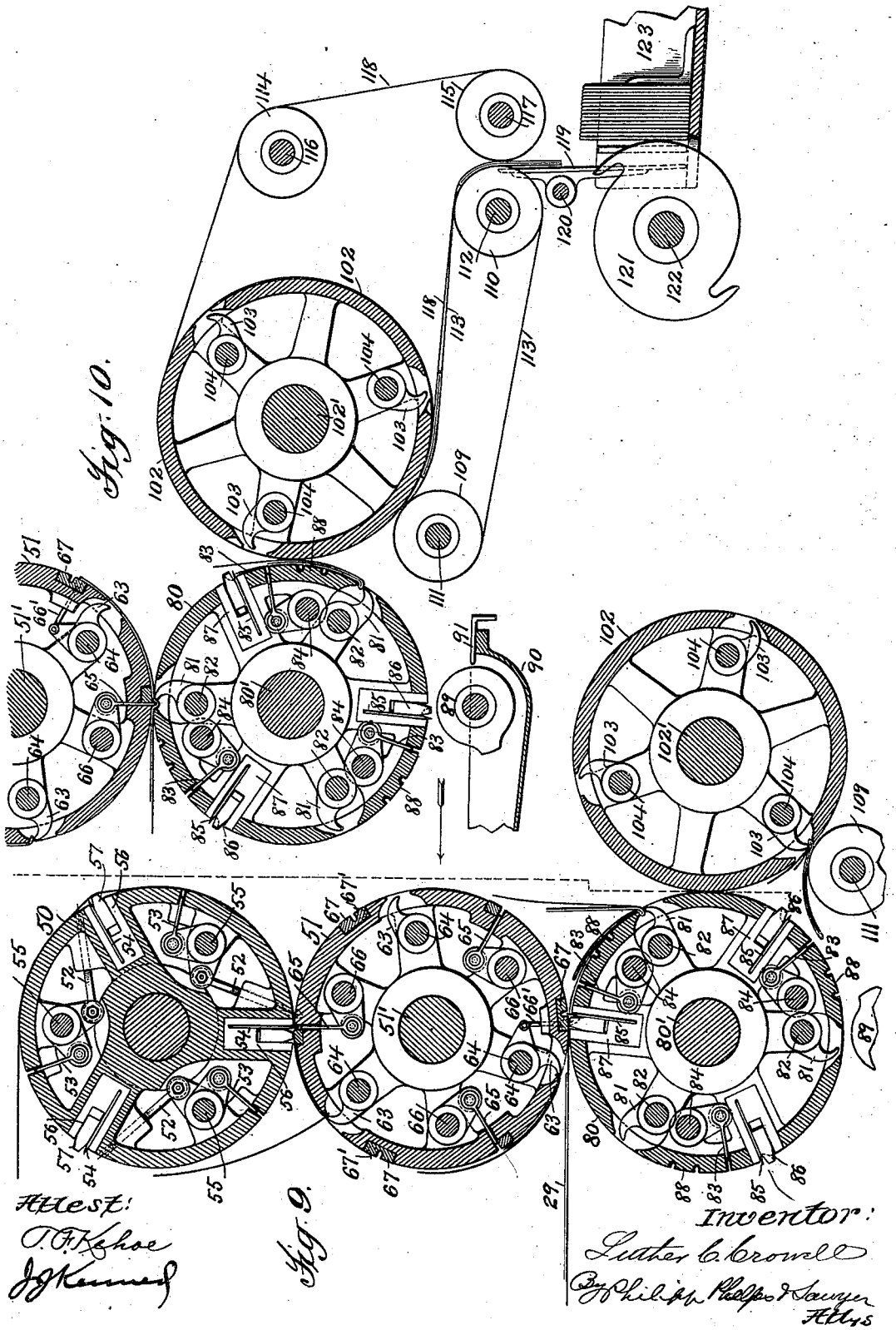


Fig. 10.

Fig. 9.

Witnesses:
C. F. Kehoe
J. J. Kennedy

Inventor:
Luther C. Crowell
By Philipp, Phelps & Sawyer
Attys

No. 649,161. Patented May 8, 1900.

L. C. CROWELL.

FOLDING MACHINE.

(Application filed July 25, 1899.)

(No Model.) 6 Sheets—Sheet 6.

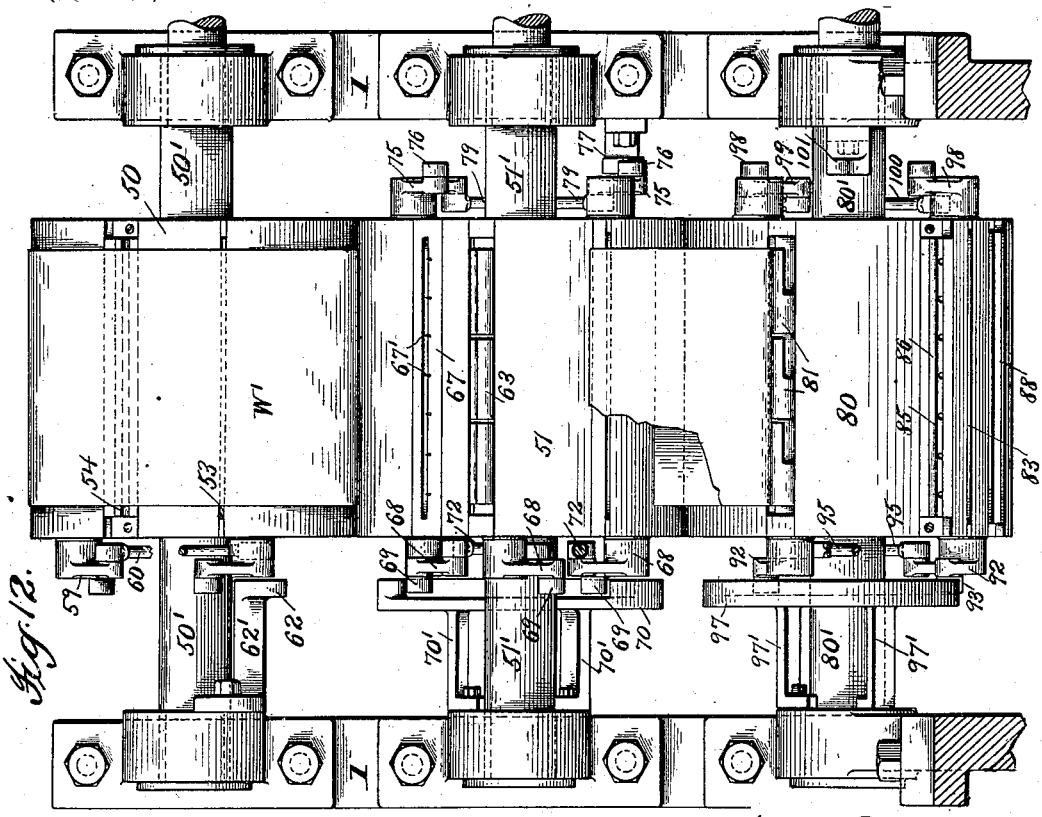


Fig. 12.

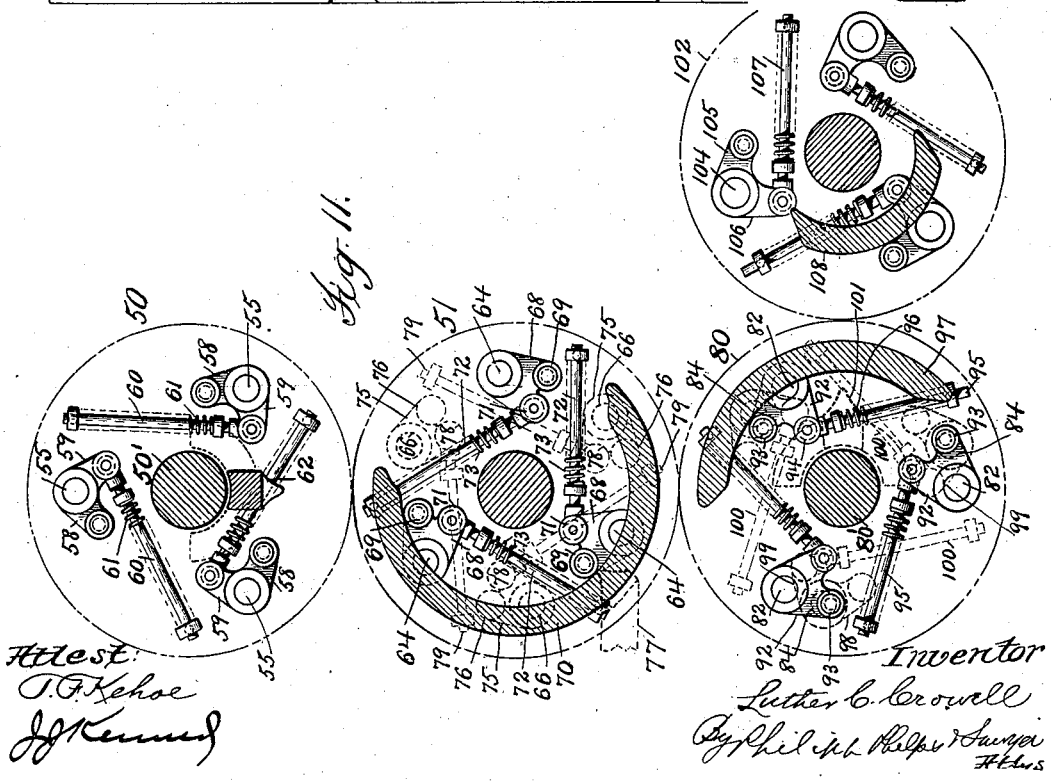


Fig. 11.

Attest:
T. F. Kehoe
J. J. Kennedy

Inventor
Luther C. Crowell
By Philip A. 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.

FOLDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 649,161, dated May 8, 1900.

Application filed July 25, 1899. Serial No. 725,049. (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 city, county of Kings, and State of New York, have invented certain new and useful Improvements in Folding-Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to certain improvements in machines for wrapping pamphlets, papers, and other analogous products.

In sending out pamphlets—such, for instance, as catalogues, advertising-circulars, and other similar matter inclosed in wrappers—it is often found desirable to introduce into the wrapper with the pamphlet a circular-letter—such, for instance, as a circular giving prices or some other similar communication to the addressee—which forms no part of the pamphlet. It is also desirable to so construct the mechanism for wrapping and introducing the circulars in such a manner that the before-referred-to circulars may be printed in the same machine that introduces them into the pamphlet or wrapped product.

It is one object of this invention to produce a machine which shall securely wrap pamphlets, catalogues, or other matter and to introduce into such pamphlets a sheet, such as a circular-letter or other similar communication, which is independent of the pamphlet, but which is to be wrapped therewith.

A further object of the invention is to produce a machine which shall combine with the folding and wrapping mechanism before referred to a mechanism for printing the circular-letter to be introduced into and wrapped with the pamphlet.

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

In the accompanying drawings, which form a part of this specification, and in which like characters of reference indicate the same parts, Figure 1 is a side view of a printing, inserting, and wrapping mechanism contructed in accordance with the invention. Fig. 2 is a plan view of a part of said mechanism. Fig. 3 is a sectional view of a part of the receiver for containing the pamphlets or other products to be wrapped. Fig. 4 is a detail view illustrating more particularly the operation of the feeding devices for removing the pamphlets or folded products from the receiver. Fig. 5 is a side view showing the receiver for holding the folded products to be wrapped and the forwarding-rolls for advancing the same to the wrapping mechanism, the receiver being partly broken away. Fig. 6 is a front view of the construction shown in Fig. 5, certain parts being shown in section. Fig. 7 is a sectional plan view, on an enlarged scale, of the receiver and the feeding mechanism. Fig. 8 is a detail sectional plan view of a part of the receiver and one of the feeding-disks, the disks being shown with one of the feeding-fingers nearly in its forward position. Figs. 9 and 10 are diagrammatic sectional views illustrating the operation of the wrapping and inserting devices, the pasting mechanism, and the delivery devices. Fig. 11 is a diagrammatic side view illustrating the cams for operating the folding-blades and gripper mechanism. Fig. 12 is a front view, on an enlarged scale, of the folding and wrapping rolls.

Referring to the drawings, and more particularly to Fig. 1, 1 indicates the frame in which the several parts of the machine are mounted, and 2 indicates a double-wide web-roll which supplies both the wrapping and the circular material. This web-roll is supported in suitable bearings in the machine, the said bearings being constructed in any usual or desired manner.

When, as in the preferred construction, the machine is constructed to print the circular or letter which is to be folded with the pamphlet or other matter, the web W will be led around a suitable guide, as 3, and then between the members of a printing-couple, which may be of any desired form or construction. In the machine shown the printing-couple is a rotary one and it will preferably always be so. The form-carrying member of said printing-couple is marked 4 and the impression member is marked 5, these members being cylinders mounted on suitable shafts 6 and 7, which are sup-

ported in journal-boxes of the usual form suitably located in the frame of the machine. The form-carrying cylinder 4 will carry a printing-surface of any desired kind—as, for instance, a form of type in imitation of type-writing. The form on the form-carrying member may be inked in any suitable manner. In the machine shown ink is supplied from a fountain 8, the ink being taken from the roll of said fountain by a ductor 9 and carried to a distributing-cylinder 10, having suitable form-inking rolls 11 and distributing-rolls 12 coöperating therewith. It will be understood, of course, that as in the present instance the web-roll furnishes the material for both the wrapper and the circular the circular-printing form will be only wide enough to print upon a part of the web. The remainder of the form-cylinder 4 may be either left blank, or it might, if desired, be constructed to print addresses on the wrapper. After leaving the printing-couple 4 5 the web W passes over a suitable guide—as, for instance, 13—and in case a double-wide web is employed it is then run over a roll 14, suitably journaled in the frame, which roll 14 has a slitter 15 coöperating therewith. The slitter 15 is in the form of a rotary knife mounted on an arm 16, which is in turn journaled on a rod 17, running across the machine. The slitter 15 divides the double-wide web into two parts W′ and W², the part W′ being the part which has been printed upon by the form and impression cylinders, and therefore constitutes the circular, and the part W² serving to form the wrapper, all as will be hereinafter described. It may be here remarked that instead of using a double-wide web two single-width webs may be used, one for the circular and the other for the wrapping material. In case this is done the slitter of course will be omitted After the double-wide web W has been slit into the parts W′ and W² the part W² is led over the roll 14 downward and around a suitable guide 18, from which it passes onward to receive the pamphlet about which it is to be wrapped and then to the wrapping mechanism. The part W′ is led beneath a suitable guide, as 19, and then over the angle-bars 20, constituting an ordinary web-transferrer, by which it is transferred laterally, after which it is advanced to the mechanism, by which it is cut and folded and associated with the pamphlet and wrapper.

The pamphlets or other similar matter to be wrapped may be supplied to the web wrapping material W² in any manner, as by hand or by any suitable mechanism. Preferably, however, the pamphlets or other matter will be fed to the wrappers by an automatic feeding mechanism. In the preferred construction the pamphlets will be contained in a receiver 21, suitably located in the machine. The receiver shown is a box open at the top and having its forward side 22 formed of thin sheet metal having a strengthening-block 23 attached thereto. This forward side is cut away at the bottom to form an opening through which the pamphlets are withdrawn from the receiver. The front side of the box is further preferably provided with flexible fingers 24, which are adjustably secured to the front of the box in any suitable manner, as by bolts 25, these fingers 24 acting as a separator to hold back the pile of pamphlets, with the exception of the bottom one, which is to be withdrawn and wrapped. The bottom 26 of the receiver 21 is preferably cut away, so as to provide spaces in which certain supporting and antifriction rolls 27 are located. The bottom 26 of the receiver is also preferably provided with a forward extension 28, which serves to direct the withdrawn pamphlet into the bite of certain forwarding-rolls, to be hereinafter described.

The pamphlets may be withdrawn from the receiver by any suitable form of feeding mechanism. In the machine shown, however, the pamphlets are fed by a pair of feeding-disks 29, which are provided with feeding fingers or extensions 30. These feeding-disks 29 are mounted on short shafts 31, said shafts being provided with crown-gears 32, which mesh with miter-gears 33, carried on a horizontal shaft 34, said shaft being driven by a gear 35 through connections which will be hereinafter described. The feeding-fingers 30 pass through slits 31′ in the vertical sides of the receiver 21, the slits being preferably formed by cutting away the bottom of the sides for a short distance from the forward end of the box. As the disks 29 rotate, the fingers 30 pass through the slits 31′, before described, and take into the fold of the pamphlet P or other similar product, as is clearly shown in Figs. 4 and 8. After the fingers 30 have engaged the fold of the pamphlet they in their further rotation withdraw it from the bottom of the pile, the remainder of the pamphlets being held back by the fingers 24, and forward it over the extension 28 into the bite of a pair of forwarding-rolls 36 37. The roll 37 is preferably a driven roll and to this end is provided with a gear 38, which meshes with the gear 35, before referred to as mounted on the shaft 34. The roll 36 is preferably spring-mounted, its shaft 39 being carried in vertical hangers 40, which are mounted in brackets 41, extending inward from the frame of the machine, as clearly shown in Figs. 5 and 6. The stems of the hangers 40 are surrounded by springs 42, which hold the roll 36 down to its work with a yielding pressure. The roller 37 is preferably shouldered off at each of its ends, as shown at 37′, so as to permit the feeding-fingers 30 to pass between the two rolls, thereby insuring that the folded pamphlet shall be introduced into the bite of the rolls 36 37.

The web W², before referred to, after passing under the guide 18 is led beneath the bottom of the receiver 21 and also passes between the rolls 36 37. It is obvious, therefore,

that as the pamphlet or folded product is introduced between the rolls 36 37 it meets the web of wrapper material W^2, and the two are thereafter advanced together. A series of tapes 43 are preferably passed around the roll 36 and also around a second feeding-roll 44, located in advance of the roll 36, this roll 44 being driven in any suitable manner from any of the moving parts adjacent thereto. A suitable belt-tightener, as 45, may be provided to keep the tapes 43 taut. The office of the tapes 43 is to hold the pamphlet firmly down upon the advancing web of wrapper material and to so obviate any slip between the pamphlet and the material. These tapes, however, form no necessary part of the invention and may be omitted, if desired. A supporting platform or guide 46 is provided, this platform operating in connection with the roll 44, before referred to, and a suitable guide-roll 47 may be introduced between the guide or platform 46 and the roll 37, if desired, to still further support the wrapper-web and pamphlet.

From the operation of the machine so far described it will be obvious that after the double-wide web which furnishes the material for the wrapper and the printed circular has been split the half W^2 will be passed down under the receiver which contains the pamphlets. As it passes under the receiver the pamphlets are fed out upon it and the web and the pamphlets pass onward between the feeding-rolls 36 37 and the tapes 43 and the supporting-guides 46 47. The other half W′ of the split web is, as before described, transferred laterally by the bars 20 20, so that it runs substantially over the web W^2. After being transferred laterally the circular web W′ passes onward to a suitable cutting mechanism, by which sheets are cut therefrom, the said sheets being then associated with the advancing pamphlets and wrapper. Preferably, however, the sheets will be partially folded before they are associated with the pamphlets and wrapper. This cutting, folding, and associating mechanism may be of any suitable form. In the machine shown the circular web W′ passes over the upper roll 50, said roll being mounted on a shaft 50′, of a set of cutting and folding rolls and between this roll and a roll 51, which forms the second roll of the set, said roll being mounted on a shaft 51′. The roll 50 is preferably provided with three sets of sheet-taking devices, though the number may be varied. In the present machine these sheet-taking devices are pins 52. The roll 50 is also provided with three sets of folding-blades 53 and three sets of cutting-blades 54. The folding-blades 53 and pins 52 are arranged in sets, there being a folding-blade and set of pins in each set, and each of these sets is mounted on a shaft 55, which extends through the roll from side to side. The cutting-blades 54 are mounted in the usual sockets 56 and are provided with the ordinary clearing-blocks 57. The shafts 55 extend beyond the end of the roll 50, and each shaft is preferably provided at one end with a two-armed block, one of the arms 58 being provided with the usual cam-roller and serving as a tumbler-block to rock the shaft to produce the requisite operation of the sheet-taking pins and cutting-blades. The other arm 59 of the two-armed block has connected to it a spring-rod 60, which is surrounded by a spring 61, the spring-rod and spring serving to hold the shaft 55 in such a position that the pins 52 will be protruded into their sheet-taking position and the blades 53 withdrawn or in their inoperative position. A suitable cam 62 is secured to the frame of the machine by arms 62′ in position to contact with the roller on the arm 58, thus withdrawing the sheet-taking pins of one set and protruding the folding-blade of the same set at the proper time.

The roll 51 is provided with sets of devices for taking sheets from the roll 50, these devices corresponding in number to the tucking or folding blades carried by the roll 50. In the present machine, therefore, there are three sets of such sheet-taking devices, preferably grippers, these grippers being numbered 63. Each set of grippers is mounted on a shaft 64. The roll 51 is further provided with three sets of folding-blades 65, each set being mounted on a shaft 66, and it also carries three cutting-blocks 67, which are mounted in its periphery and coöperate with the cutting-blades 54. The roll 51 is also provided with three other sets of sheet-taking devices, which are preferably pins. These pins may be either movable pins, as indicated at 66′, these pins in this case being carried on arms mounted on the shaft 64, or they may be stationary points, as indicated at 67′.

The shafts 64 and 66, which carry the grippers and the folding-blades, extend through the roll from side to side, the operating ends of the shafts 64 extending from one end of the roll and the operating ends of the shafts 66 extending from the other end of the roll. The shafts 64 are provided on their operating ends with blocks or arms 68, each block carrying an operating-stud 69, which runs in contact with a suitable gripper-closing cam 70 and a stud 71, to which is connected a spring-rod 72, surrounded by a spring 73. The spring-rod normally holds the grippers open, the grippers being closed against the tension of the spring by the contact of the stud 69 with the gripper-closing cam 70. The gripper-operating cam 70 is suitably supported on the frame of the machine by means of arms 70′. The shafts 66, as has been stated, extend from the opposite side of the roll 51 from the shafts 64 and are provided with arms or blocks 75, these blocks being indicated in Fig. 11 in dotted lines. These blocks are provided with operating studs or rolls 76, which run in contact with a suitable folder-operating cam 77, and are provided with other studs 78, to which are connected spring operating-rods 79, these operating-rods being arranged

to hold the folder-blades in their inner or inoperative position.

Coöperating with the roll 51 is a roll 80, which is mounted on a shaft 80', suitably journaled in bearings in the frame of the machine. This roll 80 is also provided with three sets of sheet-taking devices 81, which in the present machine are grippers, these grippers being mounted on shafts 82. The roll 80 is further provided with three sets of folding-blades 83, mounted on shafts 84, and with three sets of cutting-blades 85, these blades being provided with the usual clearing-blocks 86, mounted in sockets 87 in the roll. The roll is also preferably provided with three sets of pasting-surfaces 88, said surfaces preferably receiving their paste from a roll 89, which runs in a fountain 90, located beneath the roll and has a suitable scraper, as 91, attached thereto. The shafts 82 and 84 have their operating ends extending from opposite ends of the roll 80, and the shafts 82 are provided with blocks 92, having operating studs 93 and studs 94, to which are connected spring-rods 95, surrounded by springs 96, the office of said rods and springs being to hold the grippers 81 in their open position. The studs 93, which are preferably provided with the usual friction-rolls, contact with the gripper-closing cam 97, supported on arms 97', attached to the frame of the machine. The folder-blade shafts 84 are provided with two-armed blocks, one of the arms 98 carrying a roll which contacts with a suitable operating-cam and the other arm 99 having attached thereto a spring-rod 100, this construction being indicated in dotted lines in Fig. 11. The spring-rods 100 operate to hold the folder-blades in their retracted or inoperative position, the blades being protruded by the contact of the arms 98 with a suitable cam 101, which is attached in any suitable manner to the frame of the machine.

Coöperating with the roll 80 is a roll 102, said roll being mounted on the shaft 102' and carrying a series of sheet-taking devices which in the present machine are grippers 103, said grippers being mounted on shafts 104. The shafts 104 extend from one side of the roll 102 and are provided with two-armed blocks, one arm of which, 105, is provided with a stud or roller and the other arm of which, 106, is connected to a spring-rod 107. As in the case of the other rolls, the spring-rods serve to hold the grippers in their open position, and they are closed by reason of the contact of the roll on the arm 105 with a suitable gripper-closing cam 108, which is mounted on the frame of the machine in any convenient manner.

Supported beneath the roll 102 are a set of tape-supporting rolls 109 110, these rolls being carried on shafts 111 112 and having passed around them a set of tapes 113. The other tape-supporting rolls 114 115 coöperate with the roll 102, these rolls being supported on shafts 116 117 and operating in connection with the roll 102 to support a series of tapes 118. The rolls 110 115 are arranged in substantially the same horizontal plane and act to deliver the folded paper to a guide which may consist of a series of fingers 119, mounted on the shaft 120, and to an **S**-fly 121, which is mounted on a shaft 122 and delivers the folded pamphlets into any suitable receptacle, as a delivery-trough 123. While this form of delivery is a preferable one, any other suitable form of delivery may be used with the machine.

The various parts of the machine may be driven in any suitable manner. In the machine shown the power-shaft 124 carries a pinion 125, which meshes with a gear 126, suitably mounted in the frame of the machine. (See Fig. 1 at the left of the observer.) The pinion 126 meshes with a gear on the shaft 6 of the form-cylinder 4. This gear is the same in pitch-line as the cylinder and is therefore not shown. The shaft 6 carries a second gear 127, (indicated in dotted lines in Fig. 1,) which meshes with a miter-gear 128, which is mounted on a way-shaft 129, which shaft furnishes the operating power for the rest of the machine. Thus the shaft 129 is provided with a miter-gear 130, which meshes with a gear 131 on a short shaft 132, this shaft being provided with a gear 133, from which the gear 35, which drives the shaft 34 before referred to, is driven. In the same manner the shaft 129 is provided with another beveled gear 134, which meshes with a beveled gear 135 on the shaft 80' of the roll 80. The roll 80 is provided with a gear (not shown) which forms one of a train by which the shafts 51' and 50' of the rolls 51 and 50 are driven, the upper one of the gears of this train being shown in Fig. 2 and being numbered 136. The gear on the shaft 80' also meshes with a gear 137, which is mounted on the shaft 102'. The other parts of the machine may be driven from any of the moving parts through suitable gear connections. As these gear connections form no part of the invention they have been omitted in the interest of clearness in order not to obscure the illustration of the important features of the invention.

The construction being as before described, the operation is as follows: Assuming that a double-wide blank web is supplied from the roll 2, this web first passes over the guide 3 and then between the members of the printing-couple, the office of which is to print the circular-letter or other similar communication on one-half of the blank web. After being printed by the couple 4 5 the web passes over the guides 13 and 14 and beneath the slitter 15, by which it is divided into two parts. As the web leaves the slitter-roll that part of it which is to form the wrapper is led downward around the guide 18 and beneath the receiver 21, which holds the pamphlets or other similar articles to be wrapped. After passing under the receiver 21 the wrapper-web passes between the rolls 36 37. As the wrapper-web

passes between the rolls 36 37 a pamphlet is withdrawn from the receiver and placed upon the web. This is effected by the rotating feeding-fingers 30, mounted on the disk 29, these fingers being caused to pass through slits in the sides of the box and engage the folded pamphlet in the manner clearly shown in Fig. 4. After the rotating feeding-fingers have engaged the pamphlet they push it forward beneath the front side of the box, the fingers 24 acting as detainers to prevent the withdrawal of more than one pamphlet. The rotating feeding-fingers remain in engagement with the pamphlet until they have pushed it fairly into the bite of the rolls 36 and 37, this action being permitted by the shouldered portion 37′ of the roll 37. The pamphlet and wrapper-web are then advanced over guides 47 46 and beneath the tapes 43 to and between the folding-rolls 51 80. That part of the web which has the circular-letter printed thereon is deflected downward away from the slitter-roll 15. It then passes beneath the guide 19, after which it is transferred laterally by the angle-bars 20 20, said bars acting to shift the web so that it runs substantially over and parallel to the wrapper-web. After leaving the angle-bars 20 the circular-web W′ passes over the first cutting and folding roll 50, its leading end being taken by one set of the pins 52. It will be noticed that the folding-blades 53 are located at two-thirds of the distance from the pins 52 to their corresponding cutters 54. When, therefore, the folding-blade 53 is in position to tuck the fold of the web into the bite of the grippers 63 on the roll 51, two-thirds of the entire length of the circular will have passed the grippers, or, in other words, the folding-blade and grippers will have operated to fold the circular by one-third of its length, after which it is cut off by the cutting-blades 54 coöperating with the cutting-blocks 67. The operation described is clearly apparent from an inspection of Figs. 9 and 10. It will be understood, of course, that as the folding-blade tucks the fold of the circular into the bite of the grippers 63 the pins 52 are withdrawn, these actions being simultaneous, because the folding-blades and pins are mounted on the same shaft 55, which is operated by the arm 58 striking the cam 62. (See Fig. 11.) At the same time the grippers 63 are closed by the action of the roll 69 on arm 68, said roll striking the forward edge of the gripper-operating cam 70, which both closes the grippers and holds them closed until the folded sheet is to be released from them. The circular thus folded by a third of its length is carried forward around the roll 51 and meets the wrapper-web W^2 and the pamphlet P as they are passing between the rolls 51 and 80, the operation being clearly indicated in Fig. 9. At this time a folded circular is held by the grippers 63, and the leading end of the wrapper-web W^2, with the pamphlet thereon, is picked up by the pins 66′ or 67′, as the case may be, and is carried around the roll 51 until the folding-blade 65, which is next behind the grippers which hold the folded circular, comes opposite the grippers 81 on the roll 80. When the parts are in this position, the tucking-blade 65 is operated by the contact of the stud 76 with the cam 77 and tucks the folded circular, the pamphlet, and the wrapper-web into the bite of the grippers 81, which are immediately closed thereupon by the stud 93 on the arm 92 contacting with the cam 97 and rocking the shaft 82. The blade 63 strikes the pamphlet and the circular at about their center, so that the circular and pamphlet and wrapper-web are folded together by the onward travel of the roll 80 and the grippers 81, the circular lying inside the pamphlet and the wrapper-web being outside the pamphlet. The cutter 85 now comes into operation and cuts off the wrapper length from the web. As the roll 80 rotates the paster 89 applies paste to the pasting-surfaces 88, which, as shown, lie just beyond the grippers. The folded pamphlet, circular, and wrapper therefore rest on these surfaces. As the folded pamphlet, circular, and wrapper held by the grippers 81 and resting on the pasting-surfaces 88 pass onward between the roll 80 and the roll 102 the side of the wrapper which is next the roll is pressed against the pasting-surfaces 88 and receives a coating of paste therefrom. As the parts come into proper position the tucking-blades 83 are operated through the studs 98 and the cam 101 to tuck the folded pamphlet, circular, and wrapper into the bite of the grippers 103 on the roll 102. The blade 83 is preferably so arranged that it strikes the wrapper just in the rear of the folded edges of the pamphlet, so that only the folded wrapper is caught by the grippers 103. The pamphlet, circular, and wrapper thus held by the grippers 103 are carried around between the roll 102 and the tape-roll 109, where the rearwardly-projecting flap of the wrapper is pressed down against the paste which was previously applied to the surface of the wrapper by the pasting-surfaces 88, the pamphlet, circular, and wrapper thus folded together passing onward between the tapes 113 118 to the fly-delivery or any other suitable delivery.

Various modifications of the construction are possible. The connections by which the various parts of the machine are driven may be widely varied, and the printing, feeding, cutting, and folding and delivery mechanisms may be of any desired type, inasmuch as the invention concerns itself not with the particular mechanisms by which the invention is carried into effect, but broadly with the combination of such mechanisms by which the desired result is produced. It is to be understood, furthermore, that certain parts of the mechanism may be used without other parts. For instance, the printing mechanism might be entirely omitted, in which case the double wide web having a circular printed

upon one side will be fed directly to the slitter, or the printed web which forms the circular might come from one source and the wrapper-web might come from another source, and, if desired, these sources might be arranged in such a way as to render the transferring mechanism unnecessary. Many other modifications of the construction, which need not be specifically referred to, are possible. The invention is not, therefore, to be confined to the specific construction which has been shown and described, but is to be regarded as generic in its nature and as embracing all modifications which fall within its spirit and scope.

What I claim is—

1. In a machine for wrapping pamphlets or other matter and inserting sheets, the combination with a wrapping mechanism, of means for presenting the pamplets and sheets independently and simultaneously to the wrapping mechanism, substantially as described.

2. In a machine for wrapping papers, pamphlets or other matter and inserting sheets, the combination with a wrapping mechanism, of means for presenting the pamphlets, and wrappers to the wrapping mechanism, and independently and simultaneously presenting the sheets to the same wrapping mechanism, substantially as described.

3. In a printing, folding and wrapping machine, the combination with a printing mechanism, of means for presenting a web thereto, means for cutting sheets from the web, means for advancing a pamphlet or other matter and a wrapper, means for associating the sheet, pamphlet and wrapper, and means for thereafter wrapping the wrapper about the pamphlet and sheet, substantially as described.

4. In a wrapping-machine, the combination with means for advancing a web, of means for cutting sheets therefrom, means for associating a sheet with a pamphlet, and means for folding a wrapper about said pamphlet and sheet, substantially as described.

5. In a printing, folding and wrapping machine, the combination with means for advancing a double-wide web, of a printing-couple operating to print upon one-half of the web, a slitter, means for placing a pamphlet upon one part of the web and advancing it therewith, means for cutting sheets from the other part of the web, means for associating a sheet and pamphlet, cutting devices operating to separate the wrapper-web into wrapper lengths, and means for folding the wrapper about the pamphlet and sheet, substantially as described.

6. In a wrapping-machine, the combination with means for advancing a wrapper-web, of means for placing pamphlets or other matter to be wrapped on the web, means for advancing a second web and cutting sheets therefrom, means for associating the sheets and pamphlets, cutting mechanism for cutting the wrapper-web into wrapper lengths, and means for folding together a sheet, pamphlet and wrapper length, substantially as described.

7. In a wrapping-machine, the combination with means for advancing a wrapper-web, of means for placing pamphlets or other matter to be wrapped on the web, means for advancing a second web and cutting sheets therefrom, means for associating the sheets and pamphlets, cutting mechanism for cutting the wrapper-web into wrapper lengths, means for folding together a sheet, pamphlet and wrapper length, and pasting devices for applying paste to the wrapper length before the final fold, substantially as described.

8. In a wrapping-machine, the combination with a receiver for holding pamphlets or other matter, of means for advancing a wrapper-web beneath the receiver, means for withdrawing a pamphlet from said receiver and depositing it upon the web, means for advancing the pamphlet and web, means for advancing another web and cutting sheets therefrom, means for associating a sheet and pamphlet on the wrapper-web, means for cutting the wrapper-web into wrapper lengths, and means for wrapping the wrapper lengths about the pamphlets and sheets, substantially as described.

9. The combination with means for advancing a double-wide web, of a printing mechanism through which a part of the web is passed, a slitter, means for depositing pamphlets or other matter on one part of the web, means for transferring the other part of the web laterally, cutting devices for separating said last-mentioned part into sheet lengths, means for associating the sheet lengths with the pamphlets and wrapper-web, means for cutting wrapper lengths from the wrapper-web, and a folding mechanism operating to fold together a sheet, pamphlet and wrapper length, substantially as described.

10. The combination with means for advancing a double-wide web, of a printing mechanism through which a part of the web is passed, a slitter, means for depositing pamphlets or other matter on one part of the web, means for transferring the other part of the web laterally, cutting devices for separating said last-mentioned part into sheet lengths, means for associating the sheet lengths with the pamphlets and wrapper-web, means for cutting wrapper lengths from the wrapper-web, a folding mechanism operating to fold together a sheet, pamphlet and wrapper length, and pasting devices for applying paste to the wrapper length before the final fold, substantially as described.

11. The combination with means for advancing a wrapper-web, of means for placing pamphlets or other matter thereon, means for advancing another web, sheet cutting and folding devices for the second web, means for cutting wrapper lengths from the wrapper-

web, and means for folding a sheet, pamphlet and wrapper length together, substantially as described.

12. The combination with means for advancing a wrapper-web, of means for placing pamphlets or other matter thereon, means for advancing another web, sheet cutting and folding devices for the second web, means for cutting wrapper lengths from the wrapper-web, means for folding a sheet, pamphlet and wrapper length together, and pasting devices for applying paste to the wrapper length before the final fold, substantially as described.

13. The combination with a receiver for holding pamphlets or other matter, of a feeding mechanism for removing said pamphlets one at a time from the receiver, means for associating printed sheets with said pamphlets, and means for inclosing a sheet and pamphlet in a wrapper, substantially as described.

14. The combination with a receiver for holding pamphlets or other matter, of a feeding mechanism for removing said pamphlets one at a time from the receiver, means for associating printed sheets with said pamphlets, means for inclosing a sheet and pamphlet in a wrapper, and pasting devices for applying paste to the wrapper prior to the final fold, substantially as described.

15. The combination with a receiver for holding pamphlets or other matter, of a feeding mechanism for removing said pamphlets one at a time from the receiver, means for partially folding printed sheets, means for associating the partially-folded sheets and pamphlets, and means for inclosing a sheet and pamphlet in a wrapper, substantially as described.

16. The combination with a receiver for holding pamphlets or other matter, of a feeding mechanism for removing said pamphlets one at a time from the receiver, means for partially folding printed sheets, means for associating the partially-folded sheets and pamphlets, means for inclosing a sheet and pamphlet in a wrapper, and pasting devices for applying paste to the wrapper prior to the final fold, substantially as described.

17. The combination with a receiver for holding pamphlets or other matter, of means for advancing a wrapper-web with respect to the receiver, a feeding mechanism for withdrawing the pamphlets one at a time from the receiver and depositing them on the web, means for advancing another web, cutting and folding devices operating to cut sheets from said second web, partially fold the same and deposit them on the advancing pamphlets and wrapper-web, means for cutting wrapper lengths from the wrapper-web, and means for folding a partially-folded sheet, pamphlet and wrapper together, substantially as described.

18. The combination with a receiver for holding pamphlets or other matter, of means for advancing a wrapper-web with respect to the receiver, a feeding mechanism for withdrawing the pamphlets one at a time from the receiver and depositing them on the web, means for advancing another web, cutting and folding devices operating to cut sheets from said second web, partially fold the same and deposit them on the advancing pamphlets and wrapper-web, means for cutting wrapper lengths from the wrapper-web, means for folding a partially-folded sheet, pamphlet and wrapper length together, and pasting devices for applying paste to the wrapper length before the final fold, substantially as described.

19. The combination with means for advancing a double-wide web, of a printing mechanism operating to print upon a part of the web, a slitter for dividing the web into printed and wrapper webs, means for placing pamphlets or other matter on the wrapper-web, means for transferring the printed web laterally, cutting and folding devices for cutting sheet lengths from said printed web and partially folding the same, means for associating the pamphlets, wrapper-web and partially-folded sheets, means for cutting wrapper lengths from the wrapper-web, and means for wrapping together a sheet, pamphlet and wrapper length, substantially as described.

20. The combination with a receiver for holding pamphlets or other matter, of means for directing a wrapper-web beneath the receiver, a feeding mechanism for placing the pamphlets one at a time on the wrapper-web, means for advancing another web, cutting and folding devices for cutting sheets from said second web and partially folding the same, said partially-folded sheets being associated with the pamphlets and wrapper-web, means for cutting wrapper lengths from the wrapper-web, and wrapper-folding devices for folding together an associated sheet, pamphlet and wrapper length, substantially as described.

21. The combination with a receiver for holding pamphlets or other matter, of means for directing a wrapper-web beneath the receiver, a feeding mechanism for placing the pamphlets one at a time on the wrapper-web, means for advancing another web, cutting and folding devices for cutting sheets from said second web and partially folding the same, said partially-folded sheets being associated with the pamphlets and wrapper-web, means for cutting wrapper lengths from the wrapper-web, wrapper-folding devices for folding together an associated sheet, pamphlet and wrapper length, and pasting devices for applying paste to the wrapper length before the final fold, substantially as described.

22. The combination with a receiver for holding pamphlets or other matter, means for directing a wrapper-web beneath the receiver, feeding devices for removing the pamphlets one at a time from the receiver and depositing them on the wrapper-web, means for advancing another web, a pair of cutting and folding rolls for cutting sheets from said second web and partially folding the same, a third cutting and folding roll coöperating with

one of the other two, means for directing the wrapper-web and pamphlets between this roll and its coöperating roll, whereby the partially-folded sheets, pamphlets and wrapper-web are associated and the wrapper-web is cut into wrapper lengths, and a fourth folding-roll coöperating with the third roll, substantially as described.

23. The combination with a receiver for holding pamphlets or other matter, means for directing a wrapper-web beneath the receiver, feeding devices for removing the pamphlets one at a time from the receiver and depositing them on the wrapper-web, means for advancing another web, a pair of cutting and folding rolls for cutting sheets from said second web and partially folding the same, a third cutting and folding roll coöperating with one of the other two, means for directing the wrapper-web and pamphlets between this roll and its coöperating roll, whereby the partially-folded sheets, pamphlets and wrapper-web are associated and the wrapper-web is cut into wrapper lengths, pasting devices operating in connection with the third roll for applying paste to the wrapper, a fourth folding-roll coöperating with the third roll, and devices for laying the final fold, substantially as described.

24. The combination with a roll provided with sheet-taking devices and tucking-blades, of a second roll provided with sheet-receiving devices, tucking-blades and a gripper mechanism, coöperating cutting devices carried by the two rolls, a third roll provided with gripper mechanism, tucking-blades and a cutting mechanism coöperating with the cutting mechanism on the second roll, means for supplying a web to the first two rolls by which a sheet is cut therefrom and partially folded, means for supplying a web and pamphlet to the second and third rolls, whereby the web, pamphlet and partially-folded sheet are associated, the pamphlet and sheet are folded together, and the wrapper length is partially folded about them, and means for completing the folding of the wrapper length, substantially as described.

25. The combination with a roll provided with sheet-taking devices and tucking-blades, of a second roll provided with sheet-receiving devices, tucking-blades and a gripper mechanism and devices for taking the end of a web or sheet, coöperating cutting devices carried by the two rolls, a third roll provided with gripper mechanism, tucking-blades and a cutting mechanism coöperating with the cutting mechanism on the second roll, means for supplying a web to the first two rolls by which a sheet is cut therefrom and partially folded, means for supplying a web and pamphlet to the second and third rolls, whereby the web, pamphlet and partially-folded sheet are associated, the pamphlet and sheet are folded together, and the wrapper length is partially folded about them, and means for completing the folding of the wrapper length, substantially as described.

26. The combination with a roll carrying tucking-blades and sheet-receiving pins, of a second roll having gripper mechanisms coöperating with the tucking-blades on the first roll and also having tucking-blades and sheet-receiving pins, coöperating cutting devices carried by the two rolls, a third roll having gripper mechanisms coöperating with the tucking-blades on the second roll and provided with tucking-blades and a cutting mechanism coöperating with the cutting mechanism on the second roll, a fourth roll provided with gripper mechanisms coöperating with the tucking-blades on the third roll, means for feeding a web to the first roll, and means for feeding a web and pamphlets or other matter to be wrapped between the second and third rolls, substantially as described.

27. The combination with a roll carrying tucking-blades and sheet-receiving pins, of a second roll having gripper mechanisms coöperating with the tucking-blades on the first roll and also having tucking-blades and sheet-receiving pins, coöperating cutting devices carried by the two rolls, a third roll having gripper mechanisms coöperating with the tucking-blades on the second roll and provided with tucking-blades and a cutting mechanism coöperating with the cutting mechanism on the second roll, paste-applying surfaces on the third roll, means for applying paste to said surfaces, a fourth roll provided with gripper mechanisms coöperating with the tucking-blades on the third roll, means for feeding a web to the first roll, and means for feeding a web and pamphlets or other matter to be wrapped between the second and third rolls, substantially as described.

28. The combination with a roll carrying tucking-blades and sheet-receiving pins, of a second roll having gripper mechanisms coöperating with the tucking-blades on the first roll and also having tucking-blades and sheet-receiving pins, coöperating cutting devices carried by the two rolls, a third roll having gripper mechanisms coöperating with the tucking-blades on the second roll and provided with tucking-blades and a cutting mechanism coöperating with the cutting mechanism on the second roll, paste-applying surfaces on the third roll, means for applying paste to said surfaces, a fourth roll provided with gripper mechanisms coöperating with the tucking-blades on the third roll, means for feeding a web to the first roll, means for feeding a web and pamphlets or other matter to be wrapped between the second and third rolls, and fold-laying and delivery devices, substantially as described.

29. The combination with a receiver having one of its sides cut away to form an opening, of a pair of disks located on each side of the receiver and each mounted to rotate in a plane

parallel to the bottom of the receiver, feeding-fingers mounted on the disks, and slits in the sides of the receiver through which the feeding-fingers operate, substantially as described.

30. The combination with a receiver having one of its sides cut away to form an opening, of a pair of disks located on each side of the receiver and each mounted to rotate in a plane parallel to the bottom of the receiver, feeding-fingers on the disks, slits in the sides of the receiver through which the fingers operate, and a pair of rolls located in front of the receiver into the bite of which the fingers push the sheet, substantially as described.

31. The combination with a receiver having one of its sides cut away to form an opening, of a pair of disks located on each side of the receiver and each mounted to rotate in a plane parallel to the bottom of the receiver, feeding-fingers on the disks, slits in the sides of the receiver through which the fingers operate, and a pair of rolls located in front of the receiver into the bite of which the fingers push the sheet, one of said rolls being shouldered off to afford space for the entrance and withdrawal of the feeding-fingers, substantially as described.

32. The combination with a receiver having one of its sides cut away to form an opening, of a pair of disks located on each side of the receiver and each mounted to rotate in a plane parallel to the bottom of the receiver, feeding-fingers on the disks, slits in the sides of the receiver through which the fingers operate, and a pair of rolls located in front of the receiver into the bite of which the fingers push the sheet, one of said rolls being spring-mounted, substantially as described.

33. The combination with a receiver having one of its sides cut away to form an opening, of a pair of disks located on each side of the receiver and each mounted to rotate in a plane parallel to the bottom of the receiver, feeding-fingers on the disks, slits in the sides of the receiver through which the fingers operate, and a pair of rolls located in front of the receiver into the bite of which the fingers push the sheet, one of said rolls being spring-mounted and the other being shouldered off to afford space for the entrance and withdrawal of the feeding-fingers, substantially as described.

34. The combination with a roll having sheet-holding devices, of a pasting-surface on the roll so located as to apply paste to a sheet held by the sheet-holding devices, and means for pressing the sheet against the pasting-surface, substantially as described.

35. The combination with a roll having sheet-holding devices, of a pasting-surface on the roll in position to support a sheet held by the sheet-holding devices, means for applying paste to the pasting-surface, and means for pressing the sheet while held by the holding devices against the pasting-surface, substantially as described.

36. The combination with a roll having sheet-holding devices, of a pasting-surface on the roll and located in position to apply paste to a sheet held by the holding devices, said pasting-surface being less in extent than the sheet, means for pressing the sheet against the pasting-surface, means for removing the sheet from the roll, and means for turning over the unpasted portion of the sheet onto the pasted portion, substantially as described.

37. The combination with a roll having grippers, of a pasting-surface on the roll located near the grippers, a paste-roll for applying paste to the pasting-surface, and means for pressing a sheet against the pasting-surface, substantially as described.

38. The combination with a roll having grippers, of a pasting-surface on the roll, said surface being less in extent than the sheet to be pasted and being located near the grippers, a paste-roll for applying paste to the pasting-surface, means for pressing a sheet against the pasting-surface, means for removing the sheet from the roll having the pasting-surface, means for turning over the unpasted portion of the sheet against the pasted portion, and means for thereafter pressing the two parts of the sheet together, substantially as described.

39. The combination with means for advancing a double-wide web, of a printing mechanism for printing on one part of the web, a slitter for dividing the web, a receiver for holding pamphlets or other matter, means for directing one part of the web beneath the receiver, a transferring mechanism for transferring the other part of the web laterally, a roll carrying pins and tucking-blades, a second roll carrying gripper mechanisms coöperating with the tucking-blades of the first roll, coöperating cutting devices on the two rolls, tucking-blades and pins on the second roll, said first and second rolls operating to cut and fold a sheet from the transferred web, means for feeding a pamphlet or other matter from the receiver onto the other web, a third roll between which and the second roll the said web and pamphlet are fed, gripper mechanisms, tucking-blades and cutting mechanisms on the third roll, a fourth roll, gripper mechanisms on said roll, and fold-laying and delivery devices, substantially as described.

40. The combination with means for advancing a double-wide web, of a printing mechanism for printing on one part of the web, a slitter for dividing the web, a receiver for holding pamphlets or other matter, means for directing one part of the web beneath the receiver, a transferring mechanism for transferring the other part of the web laterally, a roll carrying pins and tucking-blades, a second roll carrying gripper mechanisms coöperating with the tucking-blades of the first roll, coöperating cutting devices on the two rolls, tucking-blades and pins on the second roll, said first and second rolls operating to

cut and fold a sheet from the transferred web, means for feeding a pamphlet or other matter from the receiver onto the other web, a third roll between which and the second roll the said web and pamphlet are fed, gripper mechanisms, tucking-blades and cutting mechanisms on the third roll, pasting-surfaces on the third roll, means for applying paste to said surfaces, a fourth roll, gripper mechanisms on said roll and fold-laying and delivery devices, substantially as described.

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

LUTHER C. CROWELL.

Witnesses:
T. F. KEHOE,
G. M. BORST.