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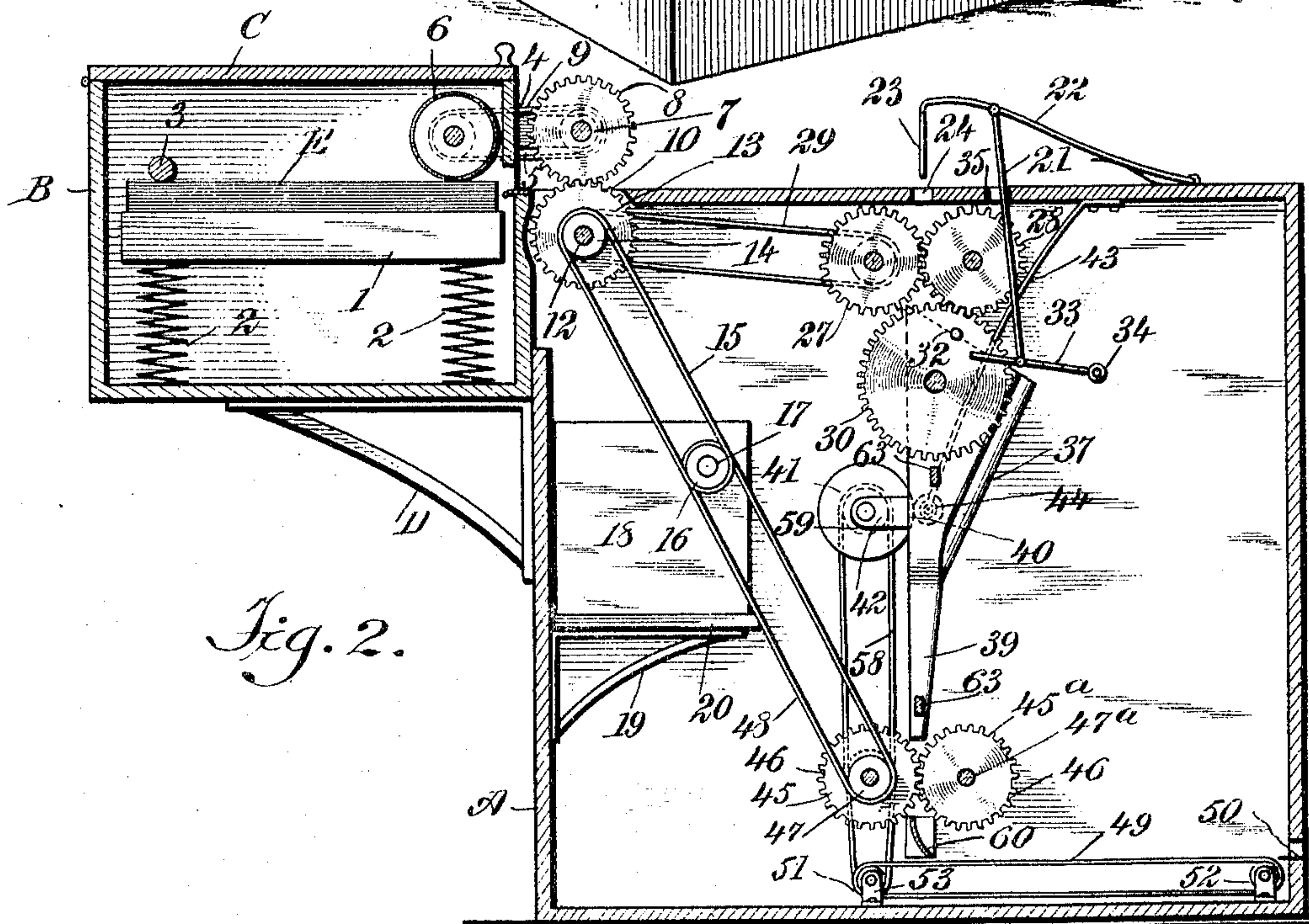
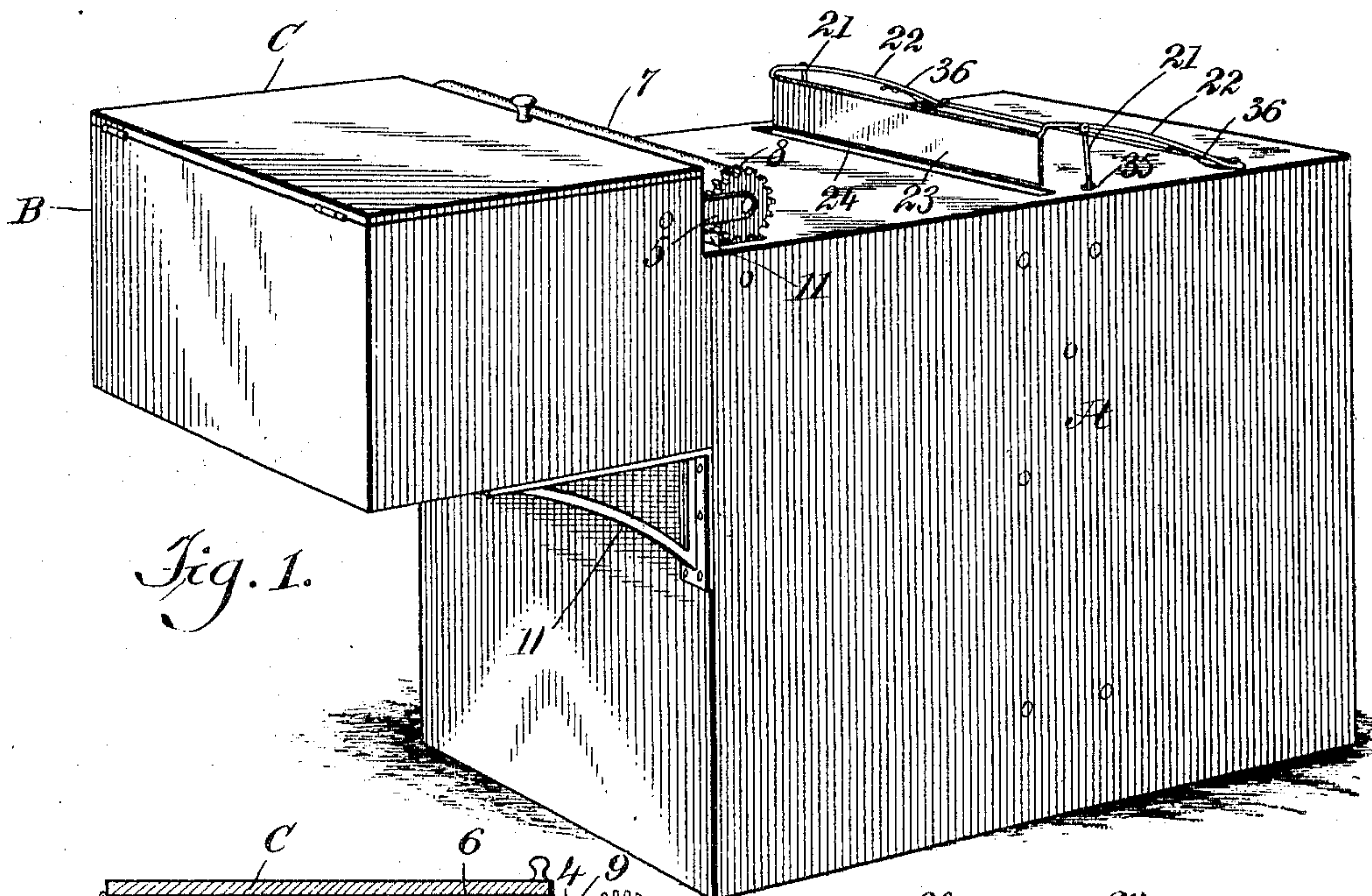
PATENTED NOV. 29, 1904.

G. A. WENZ & J. McKEE, JR.  
CIRCULAR FOLDING MACHINE.

APPLICATION FILED JAN. 8, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



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INVENTORS

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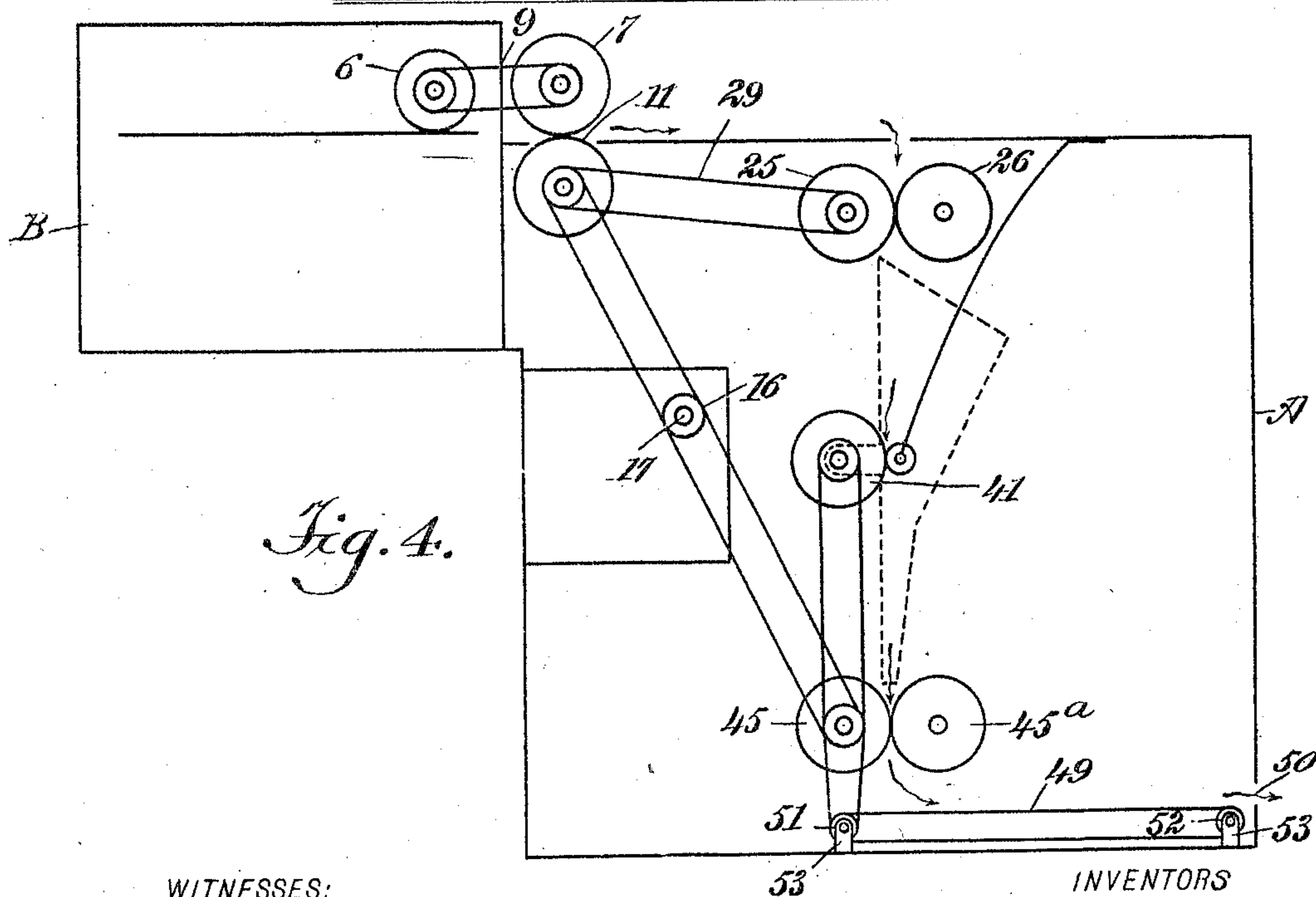
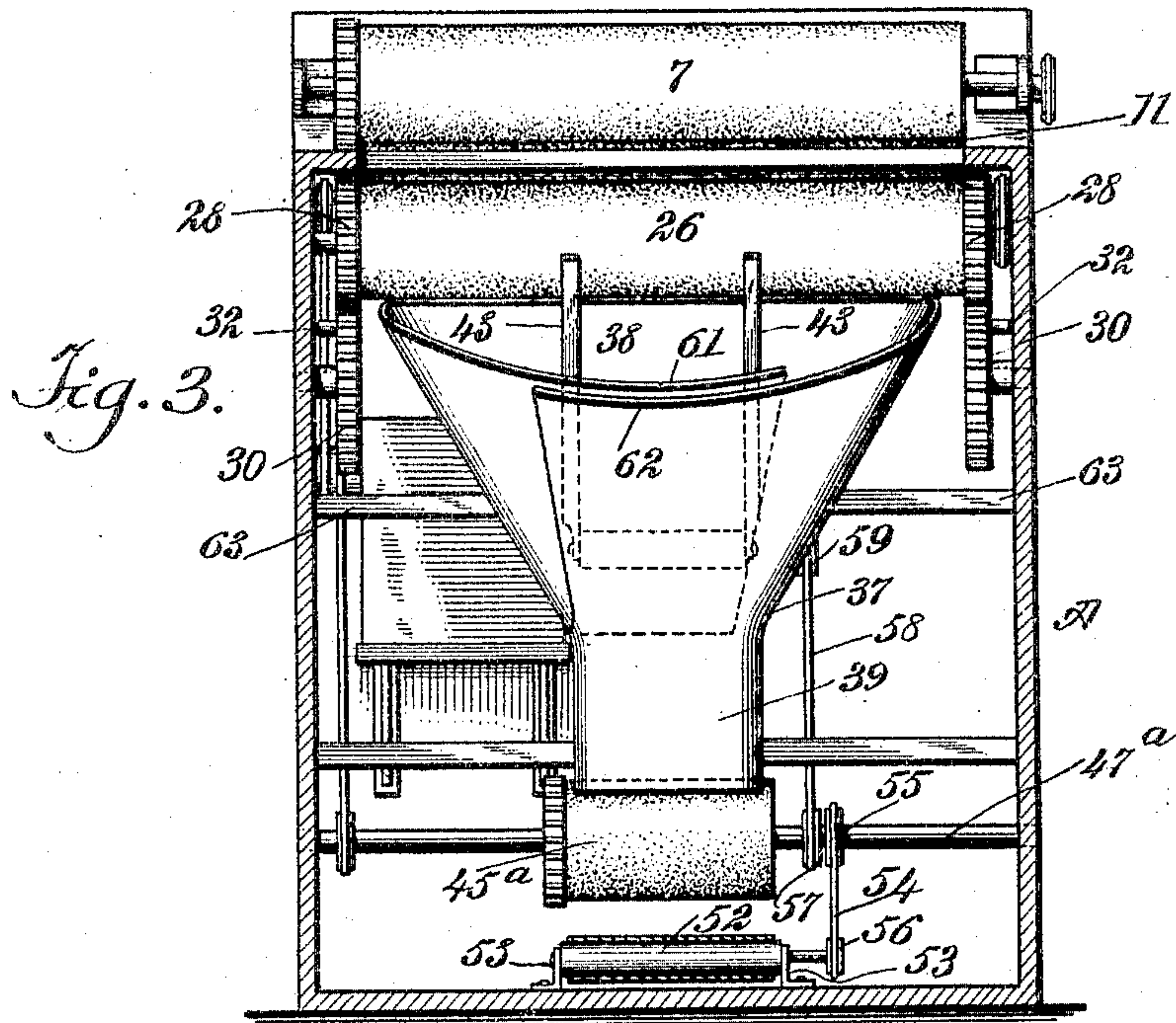
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# UNITED STATES PATENT OFFICE.

GEORGE A. WENZ AND JOSEPH McKEE, JR., OF BRIDGEBURG, CANADA.

## CIRCULAR-FOLDING MACHINE.

**SPECIFICATION** forming part of Letters Patent No. 776,444, dated November 29, 1904.

Application filed January 8, 1903. Serial No. 138,312. (No model.)

*To all whom it may concern:*

Be it known that we, GEORGE A. WENZ and JOSEPH McKEE, Jr., subjects of the King of Great Britain, and residents of Bridgeburg, in the Province of Ontario and Dominion of Canada, have invented new and useful Improvements in Circular-Folding Machines, of which the following is a full, clear, and exact description.

10 This invention relates to certain novel and useful improvements in machines for folding circulars, letters, bill-heads, papers, and the like.

15 In carrying out the present invention we have particularly in contemplation the provision of a machine which will fold letters or circulars the requisite size to enable the same to be inserted in envelopes, such folding or creasing operation being performed with positiveness, ease, and facility.

20 A further object of this invention is to so construct the machine that the flat or unfolded circulars or letters will at all times when in the receptacle of the machine be held in contact with the feeding-rolls on top of the machine, thereby insuring that there shall always be an even regular feed of the aforesaid letters or circulars when the machine is in operation.

30 It is also an object of our invention to provide an improved mechanism which will operate in conjunction with the feeding-rolls and will at stated times force the circulars or letters into the folding chute or mold.

35 Still another object of the invention is to so arrange the folding chute or mold below the aforesaid circular-inserting device and the rolls that the circular after having been folded once will be a second time creased or folded by this mold or chute operating in conjunction with additional or presser rolls arranged in the path thereof.

40 A further object of the invention is to simultaneously revolve or actuate the various folding and feeding rolls that the feed of the machine will be continuous.

50 With these and other objects of a similar nature in view our invention consists in the combination, construction, and arrangement of parts, as will be hereinafter described in

this specification, delineated in the accompanying drawings, and set forth in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, 55 in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a perspective view of a machine embodying our improvements. Fig. 2 is a vertical longitudinal sectional view of the machine. Fig. 3 is a vertical sectional view taken through the rear portion of the casing of the machine and showing the arrangement of the feeding and folding rolls and the location of the folding chute or mold therein; and Fig. 4 65 is a diagrammatic view of the machine, showing the relative arrangement of the various rolls and of the pressing or folding chute.

Referring now to the accompanying drawings, we shall for the sake of convenience designate the main casing of the machine by the letter A, said casing having supported adjacent thereto, preferably at one end and near the upper portion thereof, a box or receptacle B, said receptacle being provided with a 75 hinged cover C. For the purpose of mounting the receptacle securely on the casing brackets or supports D may be employed; but of course such receptacle may be mounted or held in place in any preferred manner. 80

Communication between the receptacle and the casing is had through means to be hereinafter described, and within the aforesaid box B is mounted a platform or table 1, upon which table are adapted to be held or placed 85 the unfolded sheets or circulars which are to be fed to the machine. For the purpose of keeping the papers or circulars upon this table at all times in contact with the feeding means, to be hereinafter described, such platform or table is mounted upon the expansible spiral springs 2 2, one end of said springs being secured to the base portion of said receptacle, the other end being held in position on the base of said table. The papers or circulars, 95 which are designated in Fig. 2 by E, are held in position on said table beneath the feeding means by means of a binder of any suitable character, said binder being shown as a rod 3. The front portion of said receptacle or 100



the part nearest the casing or cabinet A has an opening cut therein, as at 4, through which opening or slot extend brackets or supporting-bars 5, the construction being such that one end of said brackets will project into the receptacle B, while the opposite end thereof will extend outward some distance over the top portion of the casing A. In the ends of the brackets or supports 5 extending into the receptacle is mounted or journaled a feed-roll 6, which roll has its surface roughened in any suitable manner, the circulars or papers upon the platform 1 being adapted, as hereinbefore stated, to be held in contact with this feed-roll by the springs 2 2. In the ends of the brackets 5 5 projecting outward over the top portion of the casing or cabinet is journaled a roll 7, said roll having at one end a gear or cog wheel 8. The rolls 6 and 7 are connected through the medium of a driving-belt 9, so that when the roll 7 is driven through mechanism hereinafter described the feed-roll 6 in the receptacle will be also caused to revolve.

A slot or opening 10 is cut in the top portion of the cabinet transversely thereof and immediately beneath the roll 7, through which slot extends or projects a portion of the surface of the roll 11, which roll is journaled upon the shaft 12. This roll 11 is also provided at one end with a gear 13, which is adapted to intermesh with the gear 8 of the roll 7. On this shaft 12, abutting against the outer face of the gear-wheels 13, is mounted a driving-pulley 14, adapted to support one end of an endless belt 15, the belt extending around a similar driving-pulley 16 upon the shaft 17, which shaft is rotated through the medium of any suitable motor mounted in the housing 18, supported by the bracket 19 and shelf 20 inside the cabinet A.

It will be observed by the construction described thus far that when the roll 11 is driven by the motor through the shafting and belt-  
ing described the gear-wheel 13, also revolving with said roll and intermeshing with the gear 8 of the roll 7, will likewise revolve this roll, thus in turn causing a revolution of the roll 6 in the receptacle through the operation of the belt 9. As one of the sheets of the circulars E is thus pushed or carried outward by the roll 6 and fed between the rolls 7 and 11 it will travel across the top portion of the casing A until the outer edge of the sheet of paper strikes or abuts against the actuating-levers 21, connected with the rods 22, which rods support at their outer free ends the knife or folding blade 23. This knife is adapted when actuated through the movement of the levers 21 to reciprocate vertically in the path of a slot 24, arranged transversely of the top of the casing. The rods, or, as is shown in the present instance, a wire frame supporting the said knife, may be of any desired shape or form, it only being necessary that

the knife be permitted to reciprocate in the path of the slot at stated intervals relatively to the feeding of the circulars.

Journaled transversely of the casing immediately beneath the aforesaid slot 24 are the contacting rolls 25 and 26, which rolls are also provided at each end with the intermeshing cog-wheels 27 and 28, and the aforesaid roll 25 has movement imparted thereto through the medium of the endless belt 29, which belt is driven from the roll 11. The revolution of the roll 25 causes the turning of the contacting roll 26 through the medium of the cog-wheels 27 and 28, and the latter cog-wheels in turn intermesh with the gear-wheels 30, immediately beneath the rolls 25 and 26. Upon the outer faces of the gear-wheels 30 are mounted the projecting pins or studs 32, which during the course or revolution of these gear-wheels contact with the short bars 33, pivotally mounted upon a shaft 34, extending transversely of the casing, to which bars 33 are connected the aforesaid levers 21, these levers in turn projecting upwardly through the aperture 35 in the top surface of the casing. Beneath the arms or rods 22 22 of the wire knife-supporting frame are arranged springs 36 36, which tend normally to hold said arms upward against the weight of the knife. By this construction it will be seen that as the gear-wheels 30 are revolved through the means hereinbefore described the studs on the surface of these gear-wheels will trip the rods or levers 33, thus causing the levers 21 to pull downwardly upon the knife or blade 23, and as the sheet of paper is presumed at this time to be beneath the knife or blade it will be pressed downwardly through the slot 24 and pass between the rolls 25 and 26, which will make one crease therein and feed it downward into the chute or mold 37. This mold is of such peculiar shape and form that the circular will be bent or folded over again into the three-fold shape ordinarily used and of the size necessary to fit the envelop. The construction and arrangement of this chute or mold is more clearly shown in Figs. 2 and 3—that is, it is made somewhat to resemble in formation a funnel—with the wide flaring upper portion or mouth 38, the sides of such upper portion gradually tapering until they assume a perfectly-parallel position, forming the shank or tube 39 of the funnel, this latter portion 39 being about the width and size to accommodate the folded circular after it has been passed through the various forms and folded into its complete and final shape. The upper front wall of this enlarged portion of the mold or chute is inclined outwardly, and the rear or back wall of said chute, which is approximately straight or flat, is slotted, as at 40, to permit a portion of the surface of the presser-roll 41 to extend therethrough into the path of the circulars descending in the



chute. This roll is mounted transversely of the frame and is supported by means of the brackets 42. Secured to the under side of the top portion of the cabinet or casing are the downwardly-inclined bars or rods 43 43, which  
 5 extend into said chute and are spaced apart a sufficient distance so that a small roll 44 may be mounted or journaled in the same. This roll being normally held in contact with the  
 10 presser-roll 41 through the medium of these arms, which are elastic or springy in their nature, such roll will give sufficiently to permit the sheet of paper to pass therethrough in its folded condition. The folded circular  
 15 then drops downward through the throat or tubular portion 39 of the mold or chute and then passes beneath the presser-rolls 45 45<sup>a</sup>, which are also provided with intermeshing gear-teeth 46. One of the rolls 45 is driven  
 20 through the medium of a pulley 47 and an endless belt 48, which belt in turn is connected with the driving-pulley 16 on the motor-shaft 17. With the revolution of this roll 45 its accompanying roll 45<sup>a</sup> also turns or revolves,  
 25 and the sheet of paper passing therebetween will be pressed or folded into final form and will be deposited upon the endless belt 49, arranged horizontally at the bottom of the casing, the folded circular being carried on  
 30 this endless belt and passing through the aperture or slot 50 at the base of the cabinet. As will be seen, this endless carrier 49 is mounted on pulleys 51 52, journaled in brackets 53 53, said pulleys being driven through the medium  
 35 of the belt 54, connecting the wheel-pulleys 55 and 56, one on the roll-carrying shaft and the other upon the transverse shaft 47<sup>a</sup>. A second drive-wheel 57 is also mounted upon this shaft 47<sup>a</sup>, and when power is imparted to  
 40 said shaft 47<sup>a</sup> through the medium hereinbefore described this wheel 57 drives the endless belt 58, passing around the pulley 59 upon the shaft of the roller 41.

A guide 60 is mounted directly beneath the  
 45 rolls 45 45<sup>a</sup>, whereby the folded and creased circulars are directly upon the aforesaid endless carrier 49.

It will be observed that the inside of the mold or chute 37 is formed with an extension  
 50 forming the two free or outer ends 61 and 62, which serve to carry one fold of the circular inside of the other, and the entire structure of the chute or mold is mounted in the position in the aforesaid cabinet by means of  
 55 brackets or arms 63.

From the above description, taken in connection with the drawings, the construction and operation of our improved device will be readily apparent. The sheets forming the circulars or letters are fed, as hereinbefore described, from the receptacle between the rollers 7 and 11 to the reciprocating blade of knife 23, through which means they are given  
 60 one partial fold and forced downwardly through the slot 24 and are then grasped by

the rolls 25 and 26, and the fold partially formed by the knife is completed. The circular in its doubled position is then fed into the chute or mold, the peculiar shape of which, in conjunction with the presser-rolls therein,  
 70 adds the final or third fold, the circular having passed through the rolls, then dropping through the throat 39 of the chute to a position between the rolls 45 and 45<sup>a</sup>, where it is pressed into its completed folded form and fed  
 75 through the guide 60 upon the endless carrier 49, through the medium of which it is passed on through the slot 50 to any desired point outside the cabinet.

While we have shown and herein described  
 80 one particular embodiment of our improved circular-folding mechanism, it will of course be understood that we do not limit ourselves to the precise details of construction shown herein, as there may be modifications and  
 85 variations with respect to the minor parts without departing from the spirit of the invention or sacrificing any of the essential advantages thereof.

The numerous advantages incident to a  
 90 structure of this character will readily suggest themselves to those skilled in the art to which our mechanism appertains; and it will be further evident that a machine of this type is especially adapted for use in newspaper-  
 95 offices or in situations where it is necessary to fold a great number of circulars, letters, bills, and the like, and these articles will be folded by a mechanism of this type with rapidity and accuracy.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. A machine of the class described, comprising a main frame or casing, a receptacle  
 105 for the papers to be folded, mounted adjacent to and communicating with said main casing, means for feeding the sheets of paper from the receptacle to the main casing, tensioned means in said receptacle for normally holding  
 110 the papers in contact with the feeding means, mechanism in said main casing for folding the sheets, means for delivering the folded sheets from the casing, and a guide for directing the sheets from the folding mechanism to the delivery means, substantially as set forth.

2. A machine of the class described, comprising a main frame or casing, a receptacle  
 120 for the papers to be folded, mounted adjacent to and communicating with said main casing, means for feeding the papers from the receptacle to the top of the casing, devices mounted on said casing for feeding the sheets into said casing, mechanism in the casing for folding said sheets, means operatively connected to the folding mechanism for actuating  
 125 the feeding devices on the casing, and movable means for delivering the folded sheets from the casing, substantially as set forth.

3. A machine of the class described, com- 130



prising a main frame or casing, a receptacle for the papers to be folded, mounted adjacent to said casing, said casing having a slot therein, feed-rollers mounted in the path of said slot and adapted to carry the sheets of paper from the receptacle to the top of said casing, the said casing-top having a passage therein, and devices on said casing-top for partially folding and feeding said sheets into the casing through the passage-way, means in said casing for receiving the sheets and folding them the required number of times, a shaft mounted on the casing, and connections therefrom to said folding devices and to said feed-rollers, substantially as set forth.

4. A machine of the class described, comprising a main casing, means for feeding thereto the sheets of paper to be folded, a folding mechanism in said casing, such mechanism comprising rolls having contacting surfaces for giving the initial fold to the paper, and a vertical folding-chute having overlapping edges mounted adjacent to said initial folding-rolls, for receiving the sheet and forming another fold therein, and rolls mounted beneath said chute for receiving and completing the operation of folding the sheets, substantially as set forth.

5. A machine of the class described, comprising a main casing having a passage-way therein, spring-tensioned reciprocating devices for partially folding and forcing a sheet of paper into said casing through said passage-way, contacting rolls mounted beneath said passage-way adapted to complete the initial fold in the sheet, a chute beneath said rolls for receiving the paper, a second set of contacting rolls in the passage-way of the chute, a pair of rolls beneath said chute, a guideway beneath said rolls, and a carrier or delivering device beneath the guideway, substantially as set forth.

6. In a machine of the class described, the combination of a main casing, and a chute therein for folding sheets of paper, said chute having an enlarged entrance or mouth portion and a reduced throat portion, and presser-rolls having faces contacting with each other within the chute and in the path of the sheets traveling through the chute, substantially as set forth.

7. In a machine of the class described, the combination of a main casing, and a chute for folding sheets of paper mounted in said casing, said chute having an enlarged entrance or mouth portion and a reduced throat portion, a presser-roll mounted outside of and extending transversely of the chute, a portion of the periphery of said roll extending through a slot in said chute, a second spring-tensioned presser-roll mounted in said casing and extending into the chute in such manner as to contact with the surface of the first-mentioned roll extending through the slot thereof, the construction being such that the point of

contact of said roll will be in the path of the papers traveling through the chute, substantially as set forth.

8. In a machine of the class described, the combination of a main frame or casing, a paper-folding chute mounted therein, said chute having an enlarged entrance and a reduced throat portion, the ends of the enlarged portion overlapping and being free or separated, whereby one end of the paper may be folded inside the opposite portion, and presser-rolls arranged in the path of the papers traveling through said chute, substantially as set forth.

9. In a machine of the class described, the combination of a main frame or casing, of devices mounted on said casing for forcing or feeding the sheets of paper or the like into said casing, said devices comprising a frame mounted on the casing, a spring mounted on the outside of the casing and holding said frame under tension, a blade supported by said frame, levers connected with said frame and extending through apertures in the top of the casing, and a pivoted rod in said casing connected with the other end of said lever, the construction being such that when the rod is moved on its pivot the frame and its blade will be actuated, substantially as set forth.

10. In a machine of the class described, the combination with a main frame, of the casing having a slot or passage-way formed in the top portion thereof, folding-rolls provided with intermeshing gear-wheels mounted in the casing beneath said slot, gear-wheels beneath the said rolls and intermeshing with the gear of one of the two rolls, a device mounted on the top of said casing immediately above said slot, for forcing the sheet of paper therethrough to the rolls beneath the slot, levers carried with said device and extending through apertures in the casing, rods pivotally mounted on a shaft in said casing and connected with the lower end of said levers, and a stud or projection on the gear-wheels beneath the rolls, adapted when said rolls are revolved to contact with said rod to move the same and thereby actuate the device on the casing-top, substantially as set forth.

11. In a machine of the class described, the combination of a main frame, a paper-receptacle mounted adjacent to said frame, a spring-tensioned support for the paper in said receptacle, rolls for conveying the paper on the receptacle to the main frame, devices for inserting the paper into the main frame, folding-rolls in the main frame or casing for folding the papers, an endless conveyer for delivering the folded paper from the main frame, a guide for directing the folded sheet onto the conveyer, a motor, and means connected with the feeding-rolls of the receptacle, the folding-rolls and the endless carrier, for transmitting power from said motor to these parts, whereby the aforesaid receptacle, feeding-rolls, the folding-rolls and the endless carrier, will be



driven simultaneously, substantially as set forth.

12. In a machine of the class described, the combination of a main frame, a paper-receptacle mounted adjacent thereto, feed-rolls for delivering papers from the receptacle to the top of the main frame, means for inserting said papers into the main frame, folding-rolls mounted in said frame for receiving the papers from the inserting devices, a chute mounted below the folding-rolls, supplemental folding-rolls arranged below said chute, a paper-guide below the supplemental rolls, an endless carrier mounted beneath the guide, and power devices for actuating the feed-rolls, the folding-rolls, supplemental folding-rolls

and the endless carrier, simultaneously, substantially as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

GEORGE A. WENZ.

JOSEPH McKEE, JR.

Witnesses to the signature of GEORGE A. WENZ:

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