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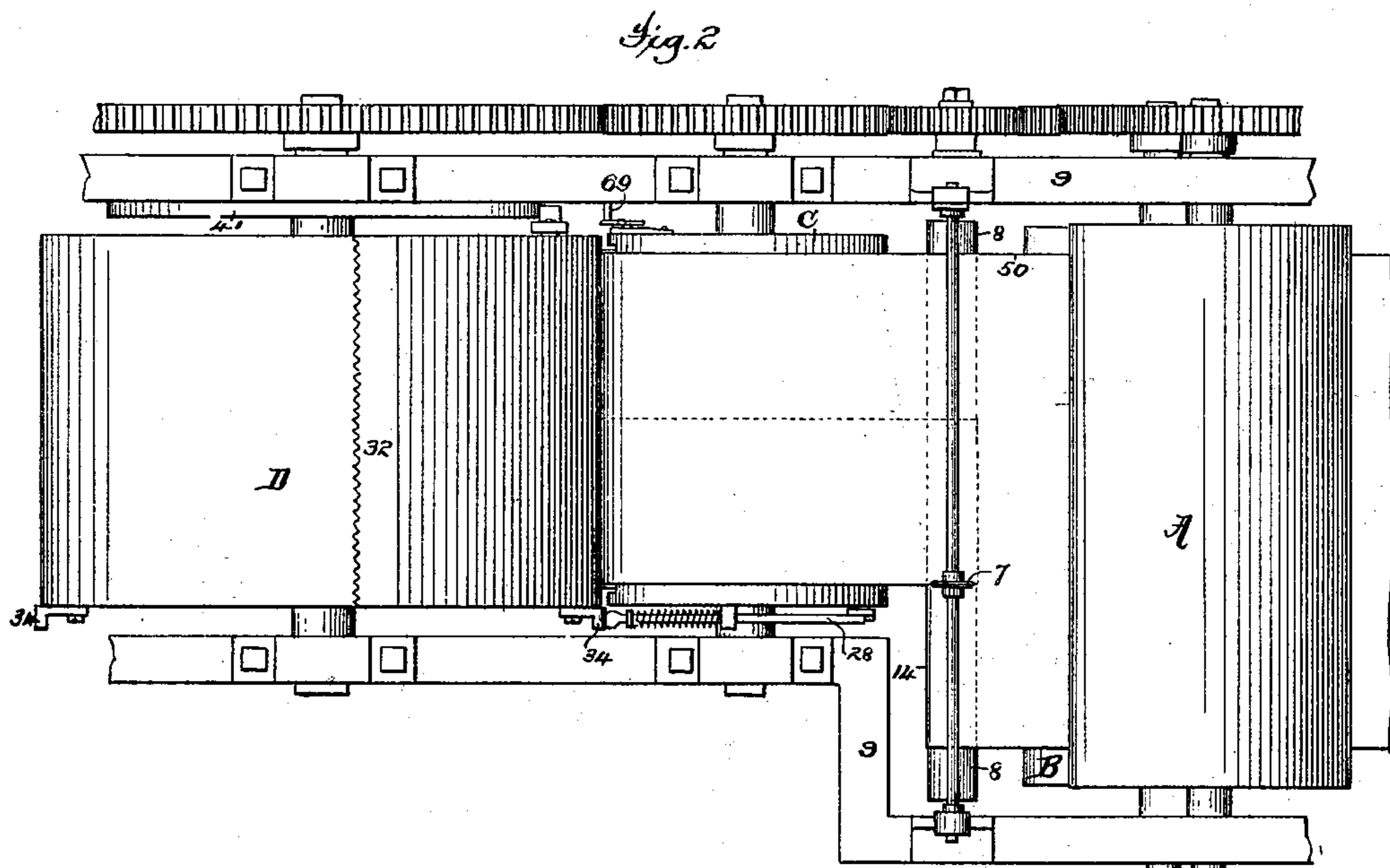
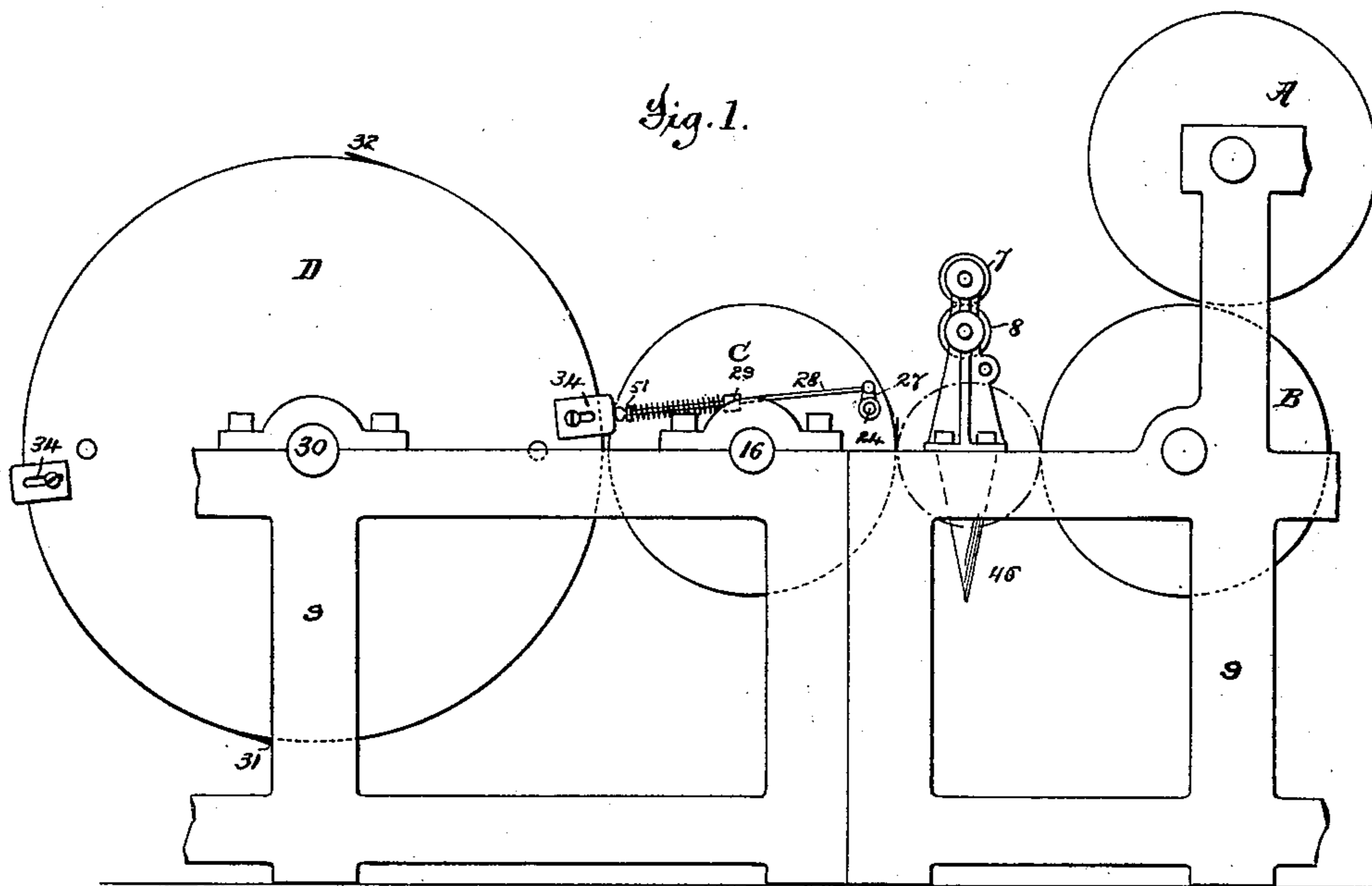
2 Sheets—Sheet 1.

L. C. CROWELL.

SHEET DELIVERY APPARATUS FOR PRINTING MACHINES.

No. 261,084.

Patented July 11, 1882.



Attest;  
Geo. H. Graham  
A. N. Jasbera

Inventor,  
Luther C. Crowell,  
by Munson & Philipp

Atty.

(No Model.)

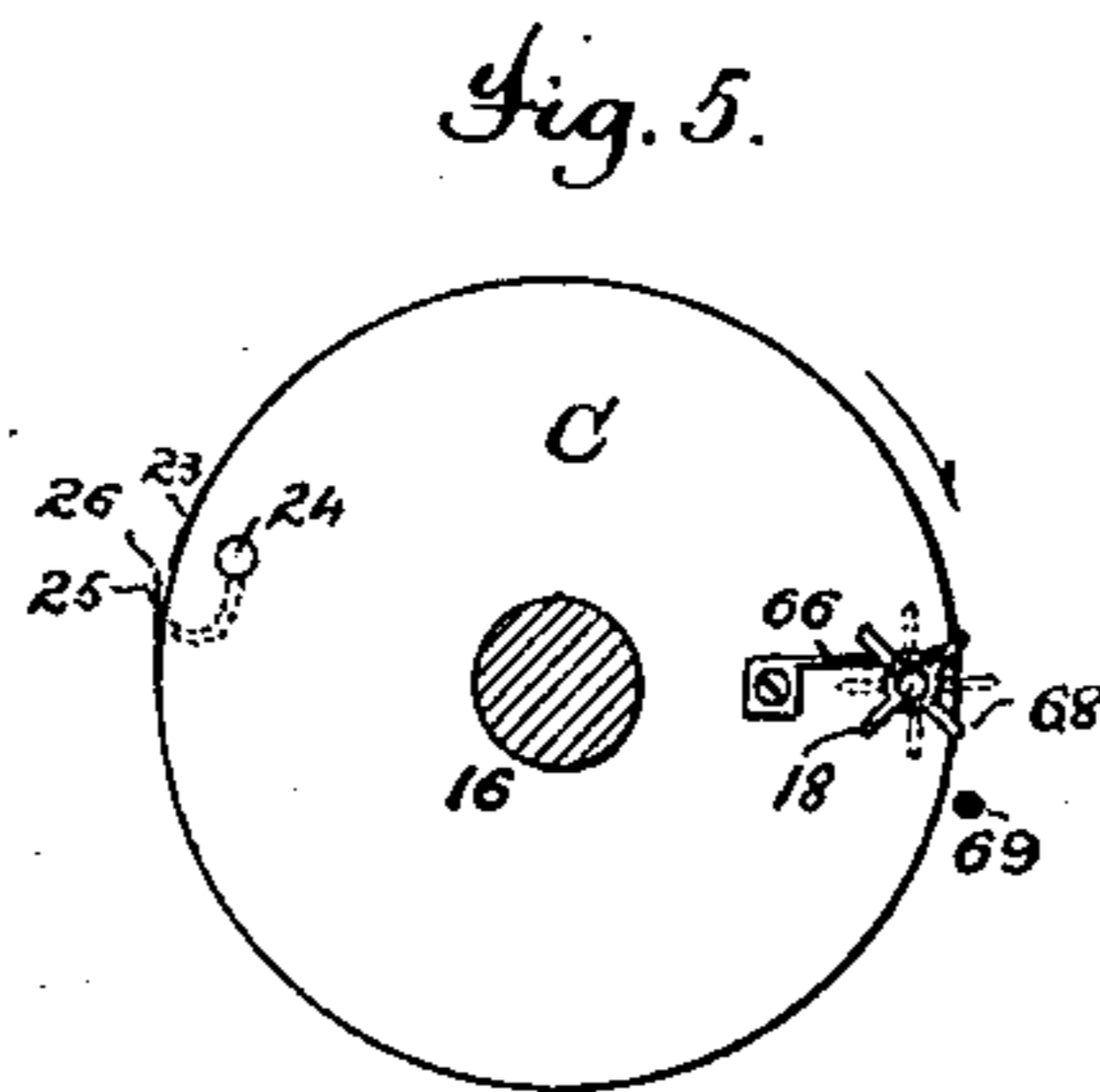
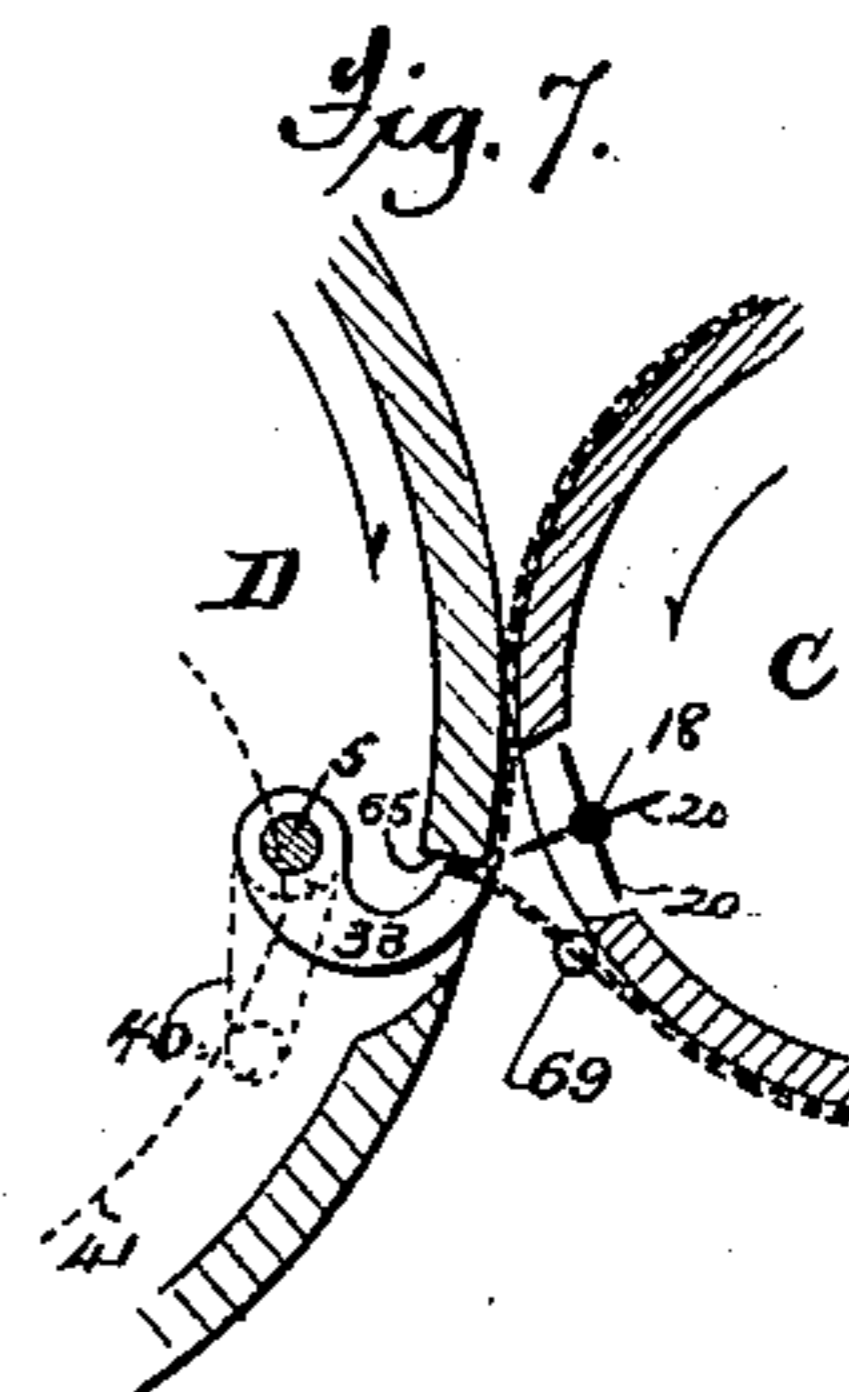
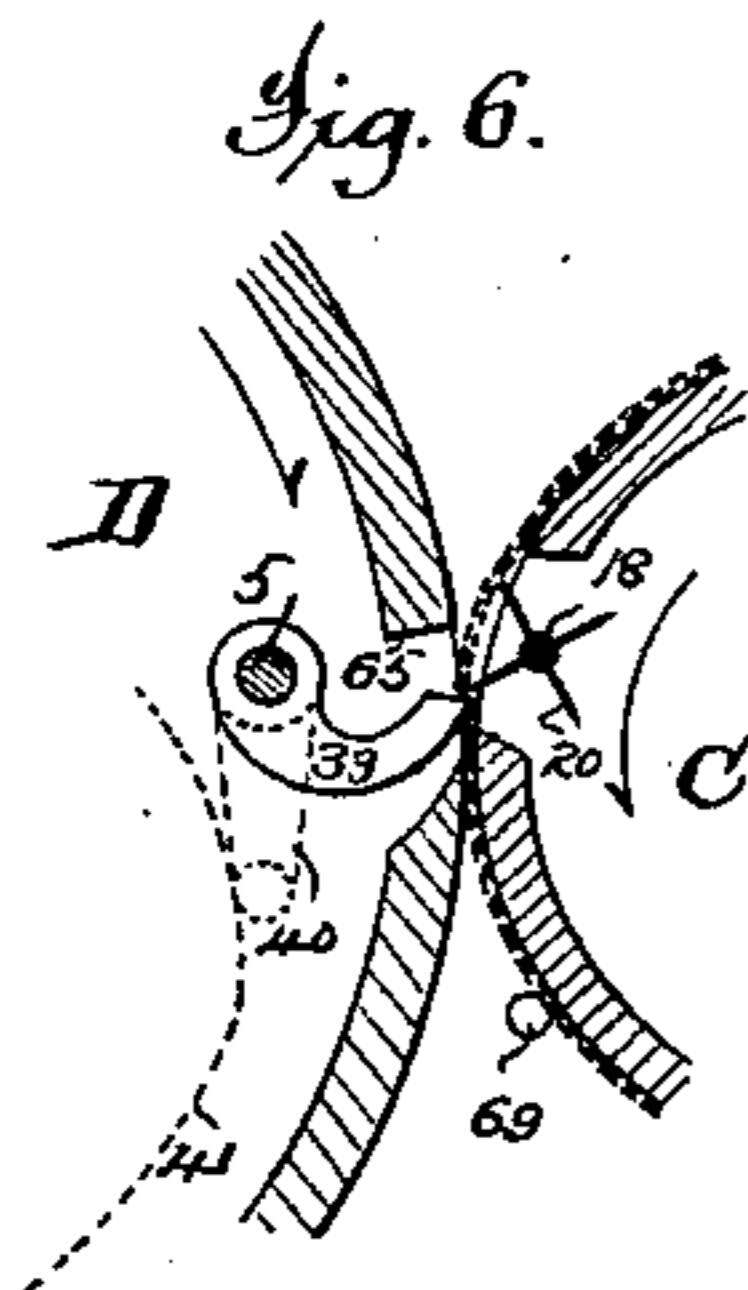
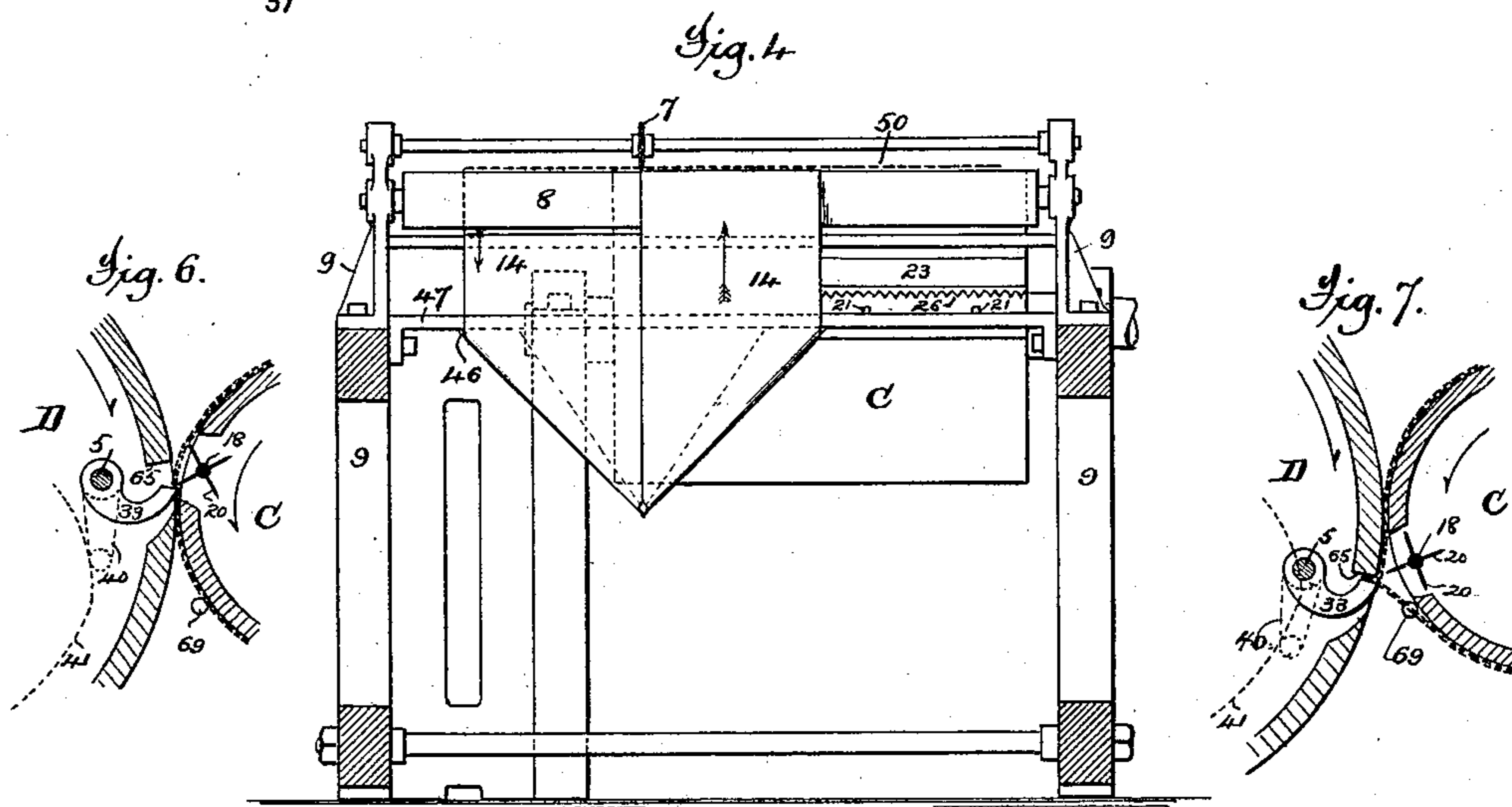
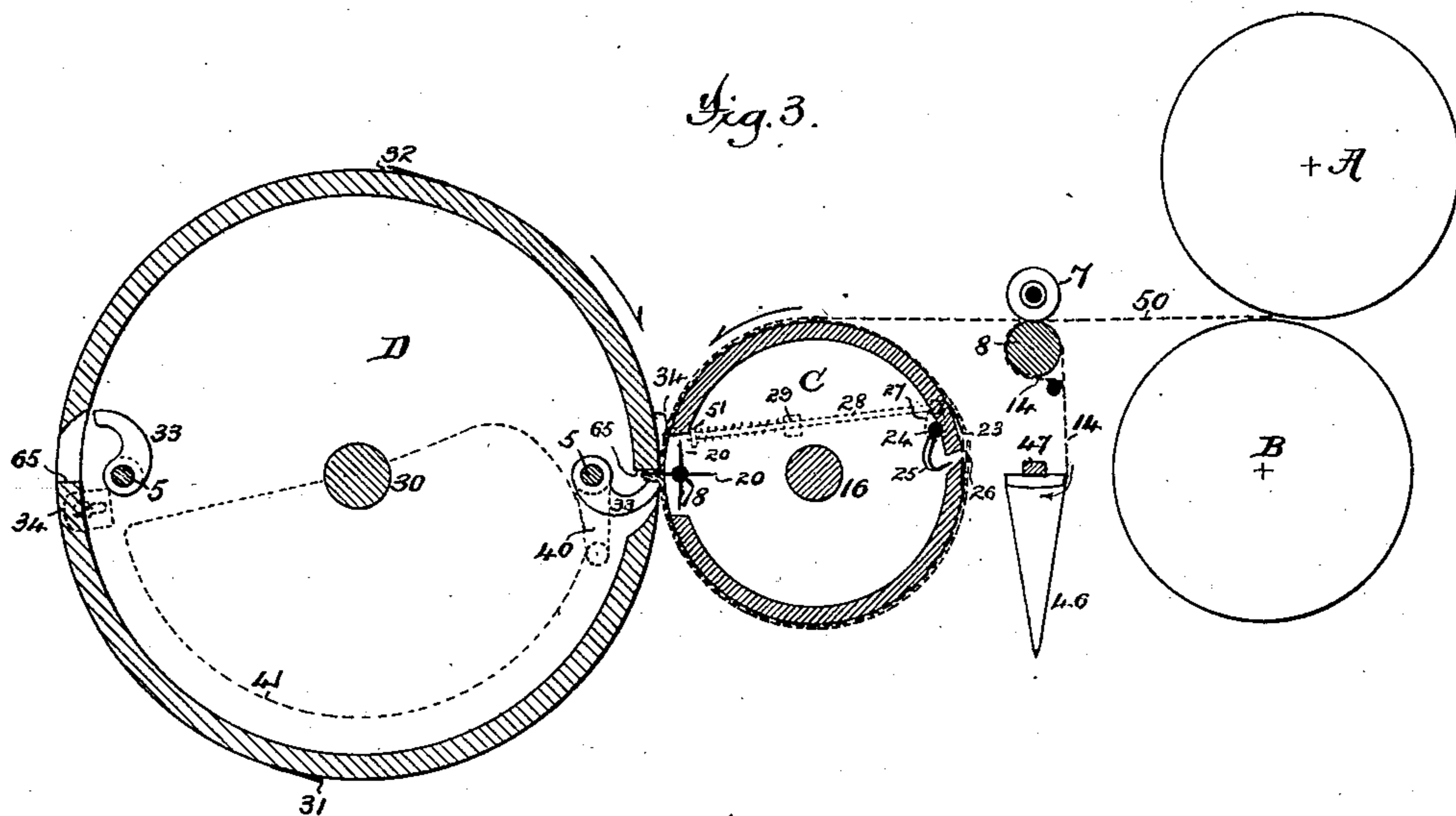
2 Sheets—Sheet 2.

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by Munson & Philipp  
Attys.

# UNITED STATES PATENT OFFICE.

LUTHER C. CROWELL, OF BROOKLYN, NEW YORK.

## SHEET-DELIVERY APPARATUS FOR PRINTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 261,084, dated July 11, 1882.

Application filed June 14, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, LUTHER C. CROWELL, a citizen of the United States, residing in the city of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Sheet-Delivery Apparatus for Printing-Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention has for its object the production of a simple and compact mechanism by which a web of paper can be printed, cut into sheets, and delivered folded either singly or associated in pairs, and with or without a supplement.

To that end the invention consists in various details of construction and combinations of parts, all of which will be hereinafter fully explained and pointed out in detail.

In the drawings, Figure 1 is a side elevation of a mechanism embodying the invention. Fig. 2 is a plan view of the same. Fig. 3 is a longitudinal vertical section of the same, the frame of the machine being omitted for the sake of clearness of illustration. Fig. 4 is a transverse vertical section, showing the slit and web-turner. Fig. 5 is an end view of the gathering-cylinder, and Figs. 6 and 7 are details to be referred to.

In the various figures, A and B are the last type and impression cylinders of any ordinary form of web-printing mechanism, these cylinders, as well as the other parts of the mechanism, being supported in a suitable frame-work, 9. Just in advance of the cylinders A B, and supported in standards rising from the frame 9, is a roller, 8, just above which, and also supported in said standards, is a shaft provided with a rotary cutter, 7, which runs in contact with said roller, both shaft and roller being free to revolve in their bearings. Just beneath the roller 8 is a bar, 47, depending from which is a web-turner, 46. Next in advance of these parts is a cylinder or carrier, C, the shaft 16 of which is journaled in suitable bearings in the frame 9. This cylinder has journaled near its periphery, in a recess, a shaft, 18, carrying four folding-blades, 20, as shown in Fig. 3. One end of this shaft projects beyond the end of the cylinder C, and is provided with four equidistant lever-arms, 68, which correspond in their positions upon the shaft with the four

folding-blades 20. This shaft, between the head of the cylinder and the arms 68, is made square, and upon this squared portion a spring, 66, secured to the head of the cylinder, presses so as to hold the shaft in any position to which it has been turned. Opposite the shaft 18 is another recess in the cylinder C, in which a shaft, 24, having its bearings in the heads of the cylinder, is journaled. This shaft is provided with two or more pins, 25, for entering and holding the paper, and with a crank, 27, to which a connecting-rod, 28, is attached, said connecting-rod passing through an eye in a bearing, 51, attached to the end of the cylinder, and being provided with a collar, 29, between which and the said bearing 51 a spiral spring surrounding said connecting-rod rests. The outer end of this connecting-rod is rounded, and, for a purpose to be presently explained, projects slightly beyond the periphery of the cylinder C.

Projecting over one edge of the recess opposite to the shaft 18 is a serrated cutting-blade, 26, provided with apertures 21, through which the pins 25 may work. On the opposite side of this recess is a spring-plate, 23, the function of which is to hold the paper against the companion cutting-blade (to be described) while it is being cut.

D is another cylinder, the shaft 30 of which is journaled in the frame 9. For a purpose that will presently appear this cylinder is made, as shown, of twice the diameter of the cylinder C. At points diametrically opposite to each other this cylinder is provided with two recesses, in which are journaled rock-shafts 5, to which are secured two or more nipper-jaws, 33. One end of each of these shafts projects beyond the end of the cylinder D, and is provided with a crank-arm, 40, having a roller which runs in contact with a stationary cam, 41, secured to the frame 9. This stationary cam is so shaped as to cause the nipping-jaws 33, through the rock-arm 40, to be moved toward and into nipping contact with the wall 65 of the recesses in which they operate, their contrary or opening movement, when the arm 40 is released from said cam, being caused by a spring (not shown) arranged in the usual manner. The cylinder D is upon one of its ends provided with two projecting cam-plates, 34, placed in such positions that as the cylinders C D revolve the projecting end of the connecting-rod

28 will come into contact therewith and be operated to withdraw the pins 25 at the proper time to release the printed sheets, as will be hereinafter more fully explained. The cam-plates 34 are made capable of removal or of being adjusted out of operative position, as shown in Fig. 3, in which one of the plates is shown as moved inside the periphery of the cylinder to such a position as not to come into contact with the rod 28 as the cylinders revolve. The cylinder D is also provided upon its periphery with two oppositely-situated cutting-knives, 31 32, the serrated edges of which, working in connection with the serrated edge of the cutter 26, form a severing mechanism of substantially the construction shown and described in United States Patent No. 212,444.

The cylinders A, B, C, and D are connected by a train of gearing, as shown in Fig. 2, the gears composing said train being so proportioned that all the cylinders move with the same surface speed.

The operation of the mechanism just described is as follows: If it is desired to deliver single sheets with inset supplements, the web 50 will be of a width sufficient to receive the matter for the main sheet and supplement abreast, and will, after leaving the last type and impression cylinders, pass over the roller 8, where it will be split by the slit 7. The narrow or supplement portion 14 will then be led down and around the turner 46 and back up over the roller 8, as shown in Fig. 4, it being by this operation transferred laterally, so as to be brought beneath and associated with the main portion of the web, with which it then passes onto the cylinder C, where their leading ends are impaled by the pins 25 and carried forward with that cylinder in its revolution. When the cylinders C D have advanced in their revolutions so as to bring the recess in which the shaft 18 is journaled and one set of the jaws 33 together the latter will, through arm 40 and cam 41, be operated so as to sweep outward and slightly within the blade-recess in cylinder C, and engage with one of the folding-blades 20, as shown in Fig. 6. As the cylinders continue their revolutions the action of cam 41 will continue to close the jaws 33, thereby moving the blade 20 upward and outward, so as to cause it to project beyond the periphery of cylinder C and carry the fold-line of the paper into the recess in cylinder D between the jaws and the wall 65, where both blade and paper will be grasped by the jaws, as shown in Fig. 3. As the cylinders continue their revolutions from this point the blade will be withdrawn, leaving the fold of the paper in the bite of jaws and wall, as shown in Fig. 7. At the moment when the jaws 33 commence to act upon the folding-blade 20, as just described, the cam-plate 34 comes into contact with the rounded end of the connecting-rod 28, so as to rock the pins 25 within the periphery of the cylinder and release the leading end of the paper in time to prevent its being torn from the pins.

In the operation of folding the paper into the bite of the jaws and wall, as just described, the shaft 18 will have been moved about one-eighth of a revolution, which will bring the arms 68 into the position shown in dotted lines in Fig. 5, so that as the cylinder C continues its revolution the arm corresponding to the blade just acted upon will be in position to be caught by the stud 69 on the frame of the machine and carried to the position shown in full lines, which will complete a one-fourth revolution of the blade-shaft 18 and restore the blades to their normal position within the periphery of the cylinder, as shown in Fig. 6, where they will be held by the spring 66, resting upon the squared portion of the shaft 18, as before explained. The paper, held by its doubled portion, as already explained, in the nip of the jaws and wall, will be carried onto the cylinder D, where it will continue until said cylinder and cylinder C have so far revolved as to bring the serrated edge of plate 26 opposite to the serrated edge of the plate 32, (or 31, as the case may be,) when said plates will articulate and sever the paper, during which operation the paper will be held by the spring-plate 23 against the plate 32. Before this occurs the paper, just back of the serrated edge of the blade 26, will have been impaled upon the pins 25, said pins having been again protruded as soon as cam 34 ceased to act upon connecting-rod 28. The sheets thus severed from the web and held in the bite of the jaws 33 and wall 65 may be released at any time after the severing has taken place by properly shaping the cam 41.

The operation just described is repeated at each revolution of the cylinder C, both cam-plates 34 being adjusted in working position, as shown in Fig. 1, both sets of jaws 33 being in operation, and the cutting-blades 31 32 alternately operating in connection with blade 26, and thus papers are delivered with supplements folded within them.

If desired, further folds may be made in the sheets by any of the well-known devices for folding paper heretofore patented by me in this country.

If it is desired to deliver papers each consisting of two sheets superposed and folded together without a supplement and with different reading-matter upon each of their pages, the first type-cylinder, as well as the last, A, must be increased in size in order to carry the requisite number of printing plates or forms, as is well known. One of the cam-plates 34 will be removed or rendered inoperative, as in Fig. 3, and one of the sets of jaws 33 will also be rendered inoperative by removing its crank-arm 40 or otherwise. The web of paper, of a width equal to the length of the folding-blade or less, as may be desired, passing from the last impression and type cylinders B A over the roll 8 and cylinder or carrier C, has its leading end impaled upon the pins 25, and carried by said pins as the cylinder revolves until the web is severed, as before described.

Shortly before this severing of the web takes place the web is again impaled upon the pins 25, which are not withdrawn during this revolution on account of the absence of one of the cam-plates 34, and the cylinder C continuing to revolve, the web will be a second time severed, the two sheets thus formed being superposed one on the other upon the cylinder, which thus becomes a gathering-cylinder upon which the pins 25 serve to hold the leading ends of the two sheets in perfect register and carry them around, as shown in Fig. 3. On this second revolution of the cylinder C the set of jaws 33 that have not been thrown out of operation, coming opposite to one of the folding-blades 20, cause it to tuck the fold-line of the sheets between said jaws and the wall 65, as before described, at which time the cam 34 which has not been removed or thrown out of operation, coming in contact with the rounded end of the connecting-rod 28, withdraws the pins 25 and releases the leading ends of the sheets. The two superposed sheets, with their doubled portions held in the nip of the jaws 33 and wall 65, will be carried around upon the cylinder D, and finally released in the manner already described, after which they may be further folded or otherwise disposed of, as already set forth.

If it is desired to deliver the papers with two sheets superposed and folded together, and also a supplement within them, the web of paper can be printed of a width sufficient to leave the supplement to be split off, as before described, and turned under the main web by the turner. The three webs thus associated will then pass onto the cylinder C and be severed and gathered as just described.

If it is desired to deliver the papers in the form of single sheets, a web of a width equal to the length of the folding-blade or less will be used, and the folding and severing devices and the pins will be arranged and operated the same as when delivering single sheets with supplements.

When it is desired to paste the supplement and main sheets constituting the signature together it may be accomplished by any of the well-known pasting devices.

It is also evident that the printed paper may be led over a longitudinal folder like that shown in my Patent No. 233,997, or of any other approved construction, and then to the cutting and folding devices shown herein.

It is to be remarked, in conclusion, that although pins, as herein shown, for retaining the sheets in proper register upon the gathering-cylinder possess many advantages over the other devices—such as grippers, tapes, &c.—which have heretofore been employed for that purpose, and are therefore specifically claimed in the combinations specified in claims 1, 2, and 3, tapes, grippers, blasts of air, or any of the other known devices for that purpose, may be used without departing from my invention.

I do not herein claim the arrangement or combination of severing and gathering mech-

anisms shown or described in United States Patent No. 213,793, dated April 1, 1879.

The present application is a division of the application for United States Letters Patent filed by me in the Patent Office on June 20, 1881, the invention shown and described therein being contained in this application; but the following is alone claimed herein.

I claim—

1. A rotating cylinder or carrier provided with means for collecting sheets upon its surface, in combination with mechanism for severing said sheets from the web while upon the surface of said cylinder or carrier, all substantially as described.

2. A rotary web-severing mechanism, as C D, one member of which is a cylinder or carrier provided with means for collecting or associating sheets upon its surface, all substantially as described.

3. The combination, with one member of a web-severing mechanism, of a cylinder or carrier, as C, provided with the other member of said web-severing mechanism, and with means for collecting or associating sheets upon its surface, all substantially as described.

4. A rotating cylinder or carrier provided with means for collecting sheets upon its surface, and with pins for securing a proper register of such collected sheets, in combination with mechanism for severing said sheets from the web while upon the surface of said cylinder, all substantially as described.

5. The combination of a cylinder provided with means for collecting two or more sheets upon its surface, and with pins for securing a proper register of such sheets, with co-operating folding mechanisms, substantially as described.

6. The combination, with a cylinder provided with means for collecting two or more sheets upon its surface, and with pins for securing a proper register of such collected sheets, of a sheet-turner, substantially as described.

7. The combination, with rotary web-printings mechanisms, of a cylinder provided with means for collecting two or more sheets upon its surface, and with pins for securing the proper register of such collected sheets, and rotary cutting mechanisms, substantially as described.

8. The pair of rotating cylinders or carriers, as C D, one of which is provided with sheet-grasping jaws and one member of a web-severing mechanism, and the other of which is provided with the other member of a web-severing mechanism, a folding-blade, and means for collecting sheets upon its surface, substantially as described.

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

LUTHER C. CROWELL.

Witnesses:

J. A. HOVEY,  
T. H. PALMER.