

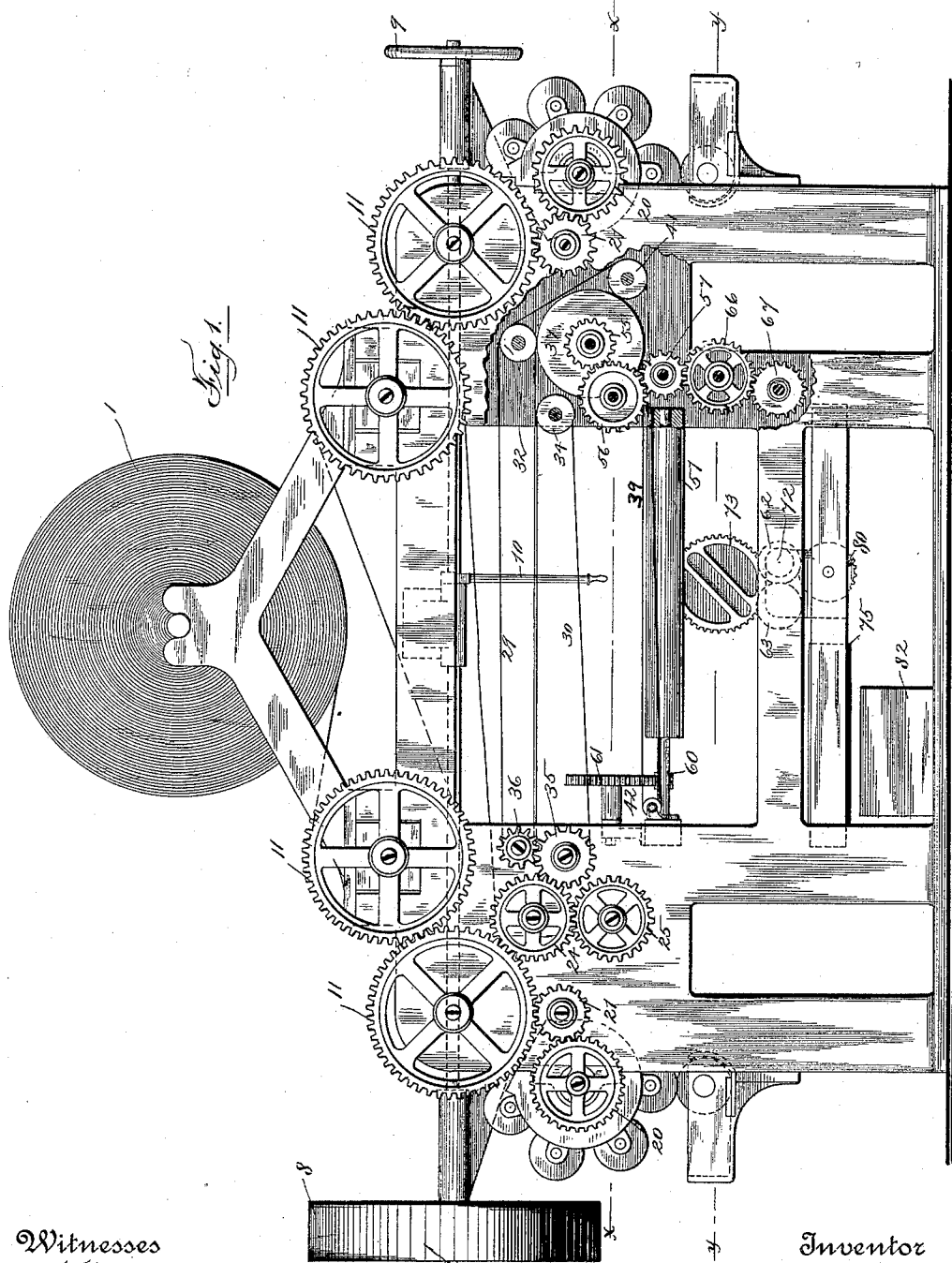
(No Model.)

5 Sheets—Sheet 1.

J. H. STONEMETZ.
PRINTING PRESS.

No. 465,632.

Patented Dec. 22, 1891.



Witnesses
Walter L. Brown
J. A. Hatch

Inventor
John H. Stonemetz
By his Attorney
Louis W. Southgate

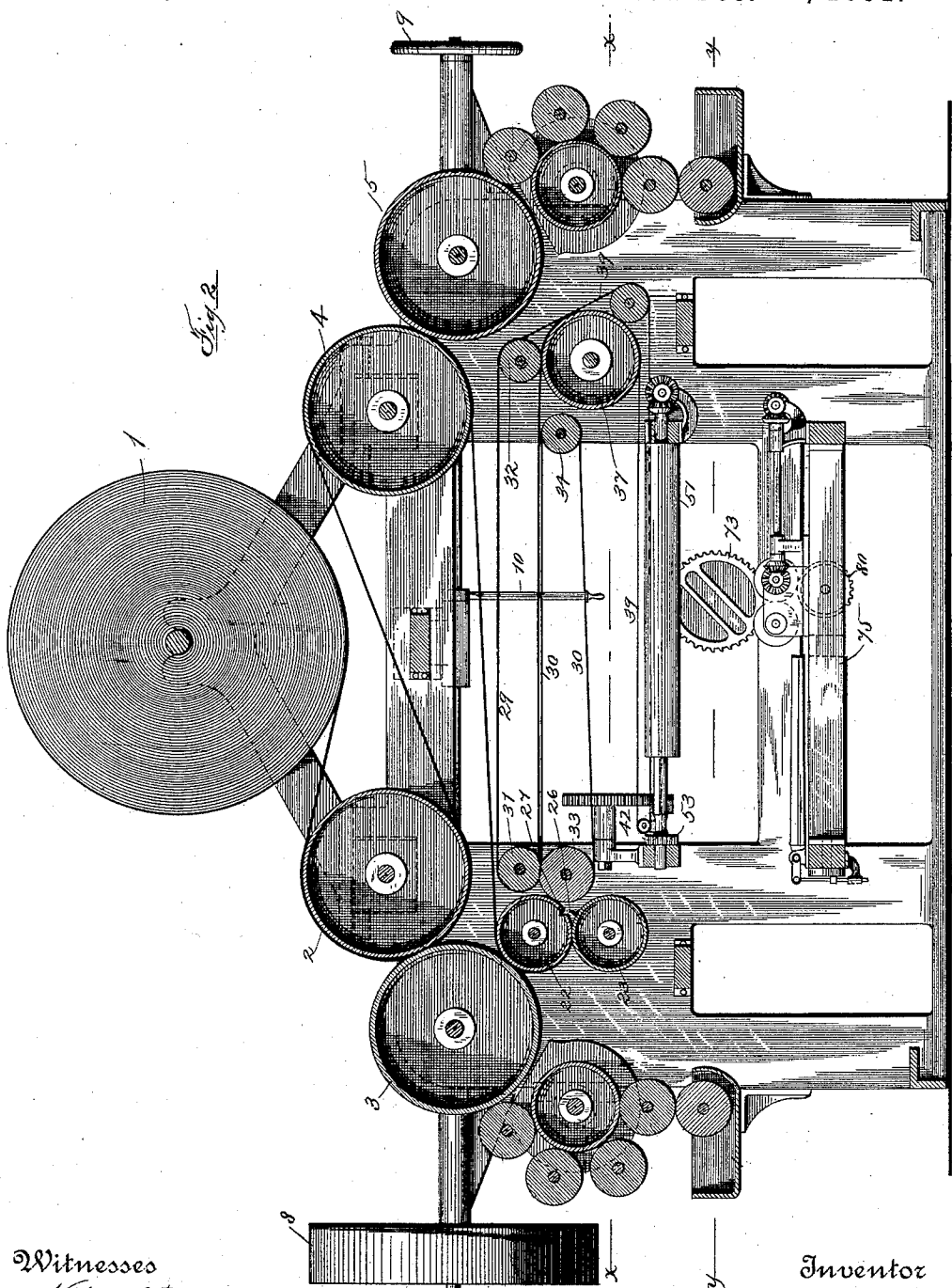
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5 Sheets—Sheet 2.

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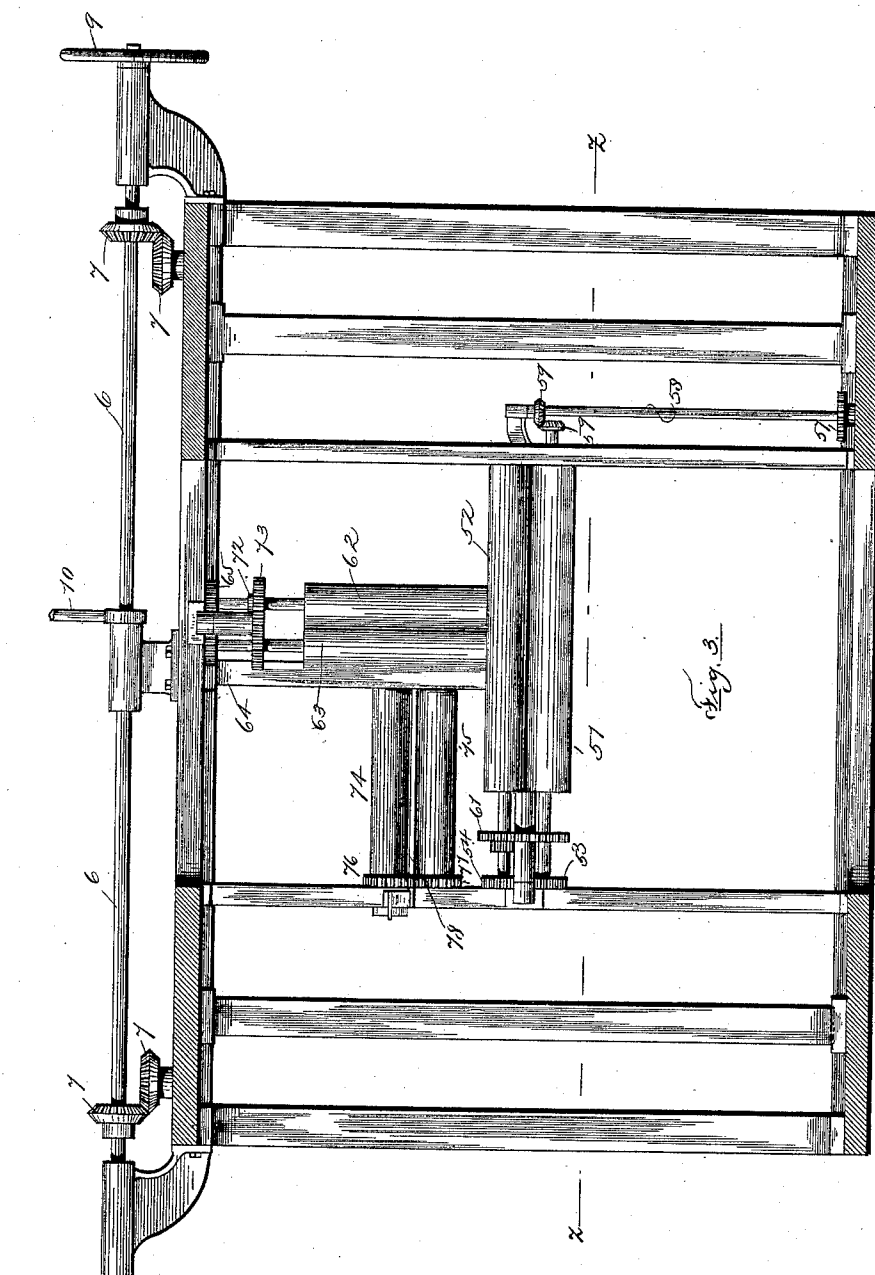
(No Model.)

J. H. STONEMETZ.
PRINTING PRESS.

5 Sheets—Sheet 3.

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Patented Dec. 22, 1891.



Witnesses 8

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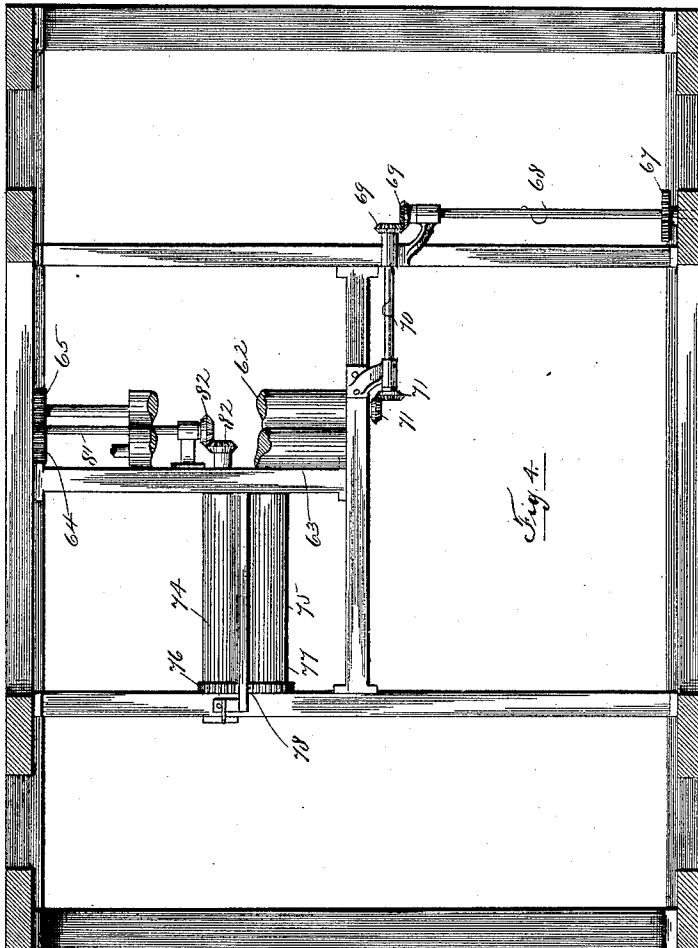
(No Model.)

5 Sheets—Sheet 4.

J. H. STONEMETZ.
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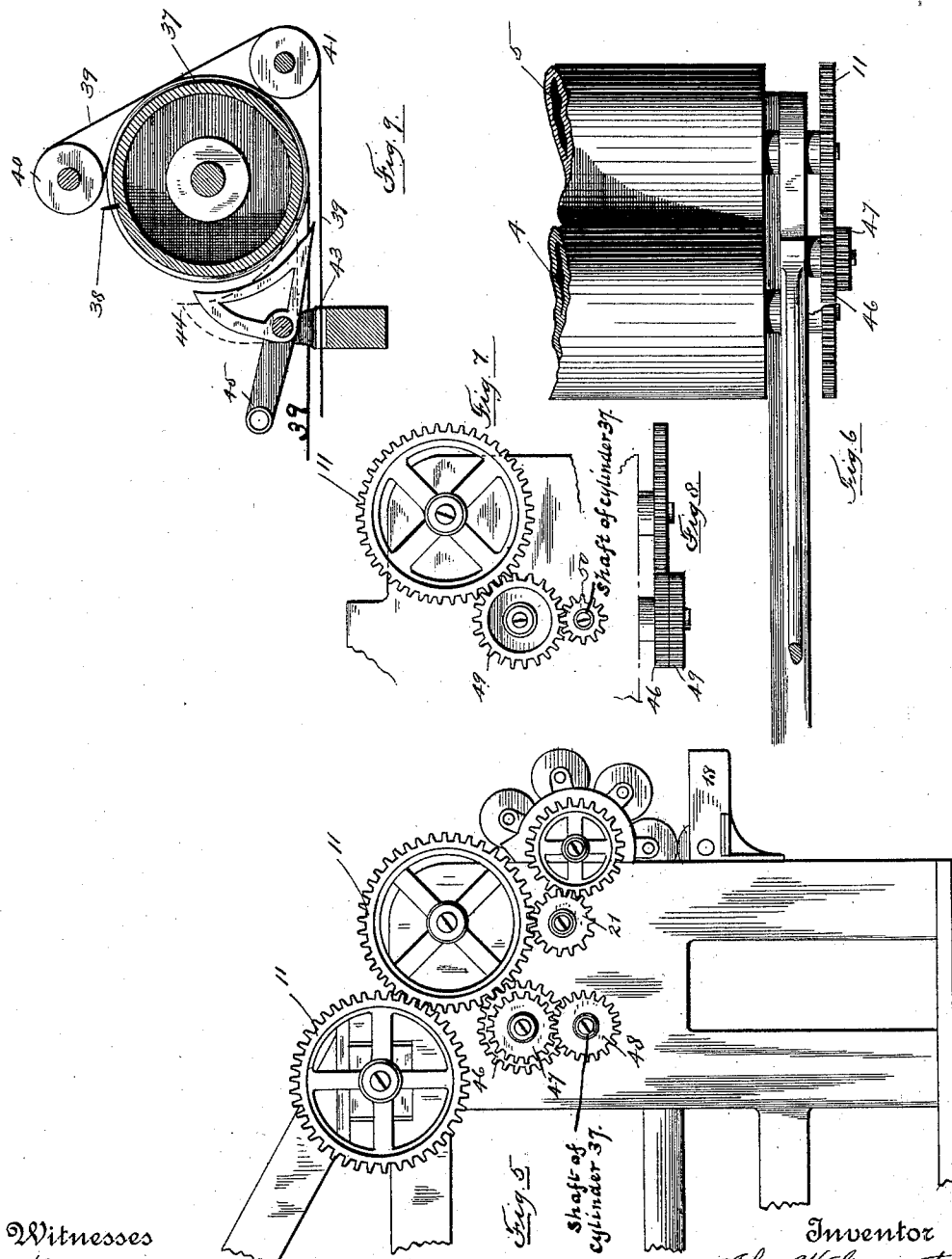
(No Model.)

5 Sheets—Sheet 5.

J. H. STONEMETZ.
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UNITED STATES PATENT OFFICE.

JOHN H. STONEMETZ, OF MILLBURY, MASSACHUSETTS, ASSIGNOR TO THE STONEMETZ PRINTERS MACHINERY COMPANY, OF SAME PLACE.

PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 465,632, dated December 22, 1891.

Application filed April 25, 1891. Serial No. 390,373. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. STONEMETZ, a citizen of the United States, residing at Millbury, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Printing-Presses, of which the following is a specification.

The aim of this invention is to produce an improved web-press and folding-machine; and to this end the invention consists of the device described and claimed in this specification and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation, partly in section. Fig. 2 is a section on line *z z*, Fig. 3. Fig. 3 is a section on line *x x*, Fig. 1. Fig. 4 is a section on line *y y*, Fig. 1. Fig. 5 is a side elevation of the collecting-cylinder-driving gearing. Fig. 6 is a plan of Fig. 5. Figs. 7 and 8 are views similar, respectively, to Figs. 5 and 6, the gearing being changed. Fig. 9 is a detail view of the collecting-cylinder and its switch mechanism.

In detail, 1 represents the roll of paper, mounted in the usual bearings on the frame. The web passes from the roll between the impression or tympan cylinder 2 and the type or form cylinder 3, where it is printed on one side, then partially around impression-cylinder 4, and between it and the type-cylinder 5, where the opposite side of the paper is printed. The impression-cylinders are driven from a shaft 6, journaled in bearings on the frame through the oppositely-disposed pairs of miter-gears 7 7. This shaft 6 has the driving-pulley 8, the hand-wheel 9, and the usual ratchet-handle 10. This disposition of a driving-shaft at right angles to the cylinders or parallel with the press is an advantageous construction, in that it economizes space sideways of the press and in that the counter-shaft can be placed parallel with the press.

The impression-cylinders are adjusted relatively to the type-cylinders by any suitable means, and the same are driven from the type-cylinders by the usual spur-gears 11. Located nearly underneath each type-cylinder is an inking apparatus of any suitable construction. This inking apparatus is preferably located at a slight angle to a vertical line through the center of the type-cylinder, so

that a considerable portion of the type-cylinder is exposed for putting on and taking off the plates.

From the impression-cylinder 4 the sheet is carried across the press to the cutting-cylinders 22 and 23. These cutting-cylinders are driven from the spur-gear 11 on the type-cylinder 3 by means of the intermeshing spur-gears 24 25, fastened on the shafts of the cutting-cylinders 22 23. The lower cutting-cylinder 23 carries the serrated knife 26, which meshes in a groove 27 in the upper cutting-cylinder 22. The gears 24 25 are one-half the size of the gear 11, so that the cutting-cylinders make two revolutions to each revolution of the impression and type cylinders. From the cutting-cylinder the web is carried between the tapes 29 30 to the cylinder 37. The tapes 29 run around the roll 31 and the loose pulleys 32, and the tapes 30 run around the roll 33 and the roller 34. The roller 33 is driven from the gear 24 by gear 35, which drives gear 36 on the roll 31. These tapes deliver the web to the cylinder 37, where the same is caught by the impaling-pins 38. The cutting-cylinders 22 23 simply perforate a series of holes in the web, but do not sever the web. The front edge of the web is delivered into the bite of the tapes 39 between the cylinder 37 and the loose pulleys 40 (see Fig. 9) on the same shaft as the pulleys 32, and as the latter are traveling faster than the web through the cutting-cylinders an accelerated movement is given, and the sheets are severed from the part of the web following it on the line of the perforations which has been made by the cutting-cylinders 22 23. When the front of the web is caught on the impaling-pins 38, the line formed by the cutting-cylinders is between the rollers 31 33 and the pins and so that the web is firmly held by said rollers 31 33. Running on the collecting-cylinder 37 are the tapes 39, which pass around loose pulleys 40 on the same shaft as the pulleys 32, around the pulleys 41, and then around the pulleys 42.

Journaled on a shaft mounted in suitable bearings 43 on the frame are stripper-fingers 44. On this shaft is fastened the arm 45, which is connected to any of the suitable mechanisms for vibrating the same. This

cylinder 37 is driven from the spur-gear 11 of the type-cylinder 5 by suitable change-gearing, so that the same may be driven at two speeds, one of which shall be twice as fast as the other. This gearing consists of an intermediate gear 46 in mesh with the gear 11. From this gear 46 power is carried to the shaft of the cylinder 37 by either one of two sets of gears, one fixed to the intermediate 46 and the other to the shaft of cylinder 37. The first of these sets of gears 47 and 48 is shown in Figs. 5 and 6 as of the same size, by means of which the cylinder 37 will be driven the same number of revolutions per minute as the intermediate 46. The second of these sets of gears 49 50 is shown in Figs. 7 and 8, the gear 49 being double the size of the gear 50, by means of which the cylinder 37 will be driven twice as many revolutions per minute as the intermediate 46. This gearing is placed on the outside of the frame, so that the same may be easily changed as desired. By means of this gearing and switching mechanism a four or eight page paper may be printed. The circumference of the type-cylinders is such that the same print the length of two or more pages, and the width of said cylinders is such that a sheet one, two, or more pages wide is printed, the columns being at right angles to the axis of the cylinder. Now when it is desired to print a four-page paper a duplicate set of plates is placed on each of the type-cylinders, and as the cutting-cylinders make two revolutions to one of the type and impression cylinders two four-page papers will be delivered to the cylinder 37 for every revolution of the type-cylinders. This cylinder 37 is run at the high speed and the stripper 44 is permanently set, so as to deliver the sheets onto the tapes 39.

When an eight-page paper is desired, the gears 47 and 48 are used and the cylinder 37 is run at the slow speed. The type-cylinders are set so as to print eight pages; but the sheets are cut the same as before described. The stripper 44 is now thrown in and out, so as to act only at every second revolution of the cylinder 37. Now the cylinder 37 will take one section of the paper, carry the same around, and then catch the second half of the paper, and thus will double the same into two sheets. Now when the front point of the double sheet thus formed comes to the stripper, the same is thrown against the cylinder 37, and thus the sheet is delivered onto the tapes 39. The circumference of the cylinder 37 is the length of one sheet plus a small amount for room to throw the strippers in and out between the tail of one sheet and the head of the one following. These tapes 39 deliver the sheet double or single, as the case may be, to a suitable folding-machine mounted in the frame intermediate between the two sets of printing-cylinders.

I preferably use what I term a "single" folding-machine—that is, a machine through which all the sheets travel through the same

mechanisms. I use this term to distinguish it from a double or other folding-machine—such, for example, as is shown in my patent, No. 429,873, dated June 10, 1890—where the sheets are alternately switched to each half of a double folding-machine. This folding mechanism may consist of the first fold-rollers 51 52, geared together by gears 53 54. The roll 51 is driven from the cylinder 37 by means of gear 55 on the same, intermediate 56, and the gear 57 on the end of shaft 58. These gears are preferably arranged on the inside of the frame, as shown. The shaft 58 drives the roll 51 by means of the miter-gears 59 59.

The tucker mechanism used to start the paper between the rolls may be of any known form, and, as shown, the pinion 60 and gear 61 are the first elements of the first fold mechanism shown and described in my application, Serial No. 387,972, filed April 7, 1891. It is deemed unnecessary to specifically describe the same in this case, and of course it is to be understood that any suitable form of tucker mechanism may be used. From the rolls 51 52 the sheet is carried over the rolls 62 63 by the usual tapes. (Not shown.) These rolls are geared together by gears 64 65 and the roll 62 is driven from gear 57 by means of intermediate 66, gear 67, fast on shaft 68, through miter-gears 69 69, shaft 70, and miter-gears 71 71. The sheet may be tucked between these rolls 62 63 by the same kind of tucker mechanism described in connection with the rolls 51 52, and 72 and 73 represent the pinion and gear of such a mechanism. From these rolls 62 63 the sheet is carried by the usual tapes (not shown) over the cylinders 74 75, which are geared together by the gears 76 77. Any suitable form of tucker may be used to tuck the sheet between these rolls. The roll 74 is driven from the gear 65 by means of gears 80, shaft 81, and miter-gears 82. Thus the paper is given three folds, and is finally delivered into any suitable collecting apparatus 82. It will be readily understood that the particular form and details of this folder may be varied without departing from the scope of my invention, as expressed in the claims.

The operation of the press is as follows: The web passes from the roll between the impression or tympan cylinder 2 and type-cylinder 3, where the first side is printed, then between impression or tympan cylinder 4 and type-cylinder 5, where the second side is printed, then across to the cutting-cylinders 22 23, around and between the same and the cylinder 23, when it is perforated, and then to the cylinder 37. Two sheets are collected here, as before described, for an eight-page paper; but the sheets for a four-page paper simply pass around this cylinder 37. The sheets from the cylinder 37 then pass to the folder by the tapes 39, and here are given the desired number of folds.

It will be noted that the folder is driven from the cylinder 37. Thus if the latter is

speeded for a four-page paper the folder will work twice as fast as when the collecting-cylinder forms a double sheet. In other words, the folder will run exactly the proper speed to receive and fold the sheets delivered by the cylinder, no matter whether the press is adjusted to print a four or an eight page paper, as by adjusting the speed of the collecting-cylinder the speed of the folder is also adjusted.

With the folder shown the sheets must be fed onto the first folding-rollers at a considerable distance apart, for the reason that the sheet must stop and then be tucked between the folding-rollers, and as the sheet goes between the folding-rollers with a motion that is at right angles to the former travel of the sheet there is considerable lost time. This must be provided for by feeding the sheets onto the folder much faster than the web travels through the printing mechanism, so that there will be a considerable space between the sheets as they travel onto the folding-rolls.

The normal speed of the cylinder 37, when collecting the products for an eight-page paper, is slightly in excess of that of the printing mechanism, and, as will be readily understood, the collecting will allow the slow feeding of the sheets to the folder; but when a four-page paper is desired the sheets must be given a greatly-accelerated movement over that of the web, and this is provided for by running the cylinder 37, as before described, at an increased speed.

The details of construction herein shown may be greatly varied by a skilled mechanic without departing from the scope of my invention.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a printing-press, the combination of the printing mechanism, the cylinder 37, to which the printed products are delivered from said printing mechanism, a change-gearing for driving said cylinder at different speeds relatively to the said printing mechanism, and a switching or stripping mechanism adapted to co-operate with said cylinder

37, whereby the same may be used as a collecting or as a directing cylinder, substantially as described.

2. The combination of a printing mechanism, the cylinder 37, to which the printed products are delivered, a change-gearing for driving said cylinder 37 at different speeds, a switching or stripping mechanism co-operating with the cylinder 37, whereby the same may be used either as a directing or as a collecting cylinder, and a folder driven by gearing connected to the cylinder 37, to which folder the products are delivered from said cylinder, substantially as described.

3. In a web-printing press, the combination of two sets of type and impression cylinders, the cutting-cylinders, to which the printed web is led, the cylinder 37, into which the printed products are delivered, a change-gearing for driving the cylinder 37 at different speeds, a switching or stripping mechanism co-operating with said cylinder 37, whereby the same may be used either as a collecting or directing cylinder, and a paper-folding machine geared to be run from the said cylinder 37, substantially as described.

4. In a web-printing press, the combination of the printing mechanism and sheet-severing mechanism, the cylinder 37, to which the printed products are delivered, a gearing consisting of the gears 46, 47, and 48 or the gears 46, 49, and 50, whereby either of two speeds may be obtained, a switching or stripping mechanism mounted to co-operate with said cylinder 37, whereby the same may be used as a collecting or directing cylinder, and a paper-folding machine driven from the said cylinder 37 by suitable gearing, whereby the speed of the folding-machine is dependent upon the speed of the cylinder 37, substantially as described.

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

JOHN H. STONEMETZ.

Witnesses:

LOUIS W. SOUTHGATE,
HERBERT MCINTOSH.