(No Model.)

2 Sheets—Sheet 1.

W. SCOTT.

SHEET DELIVERY APPARATUS FOR PRINTING MACHINES.

No. 396,896. Patented Jan. 29, 1889.

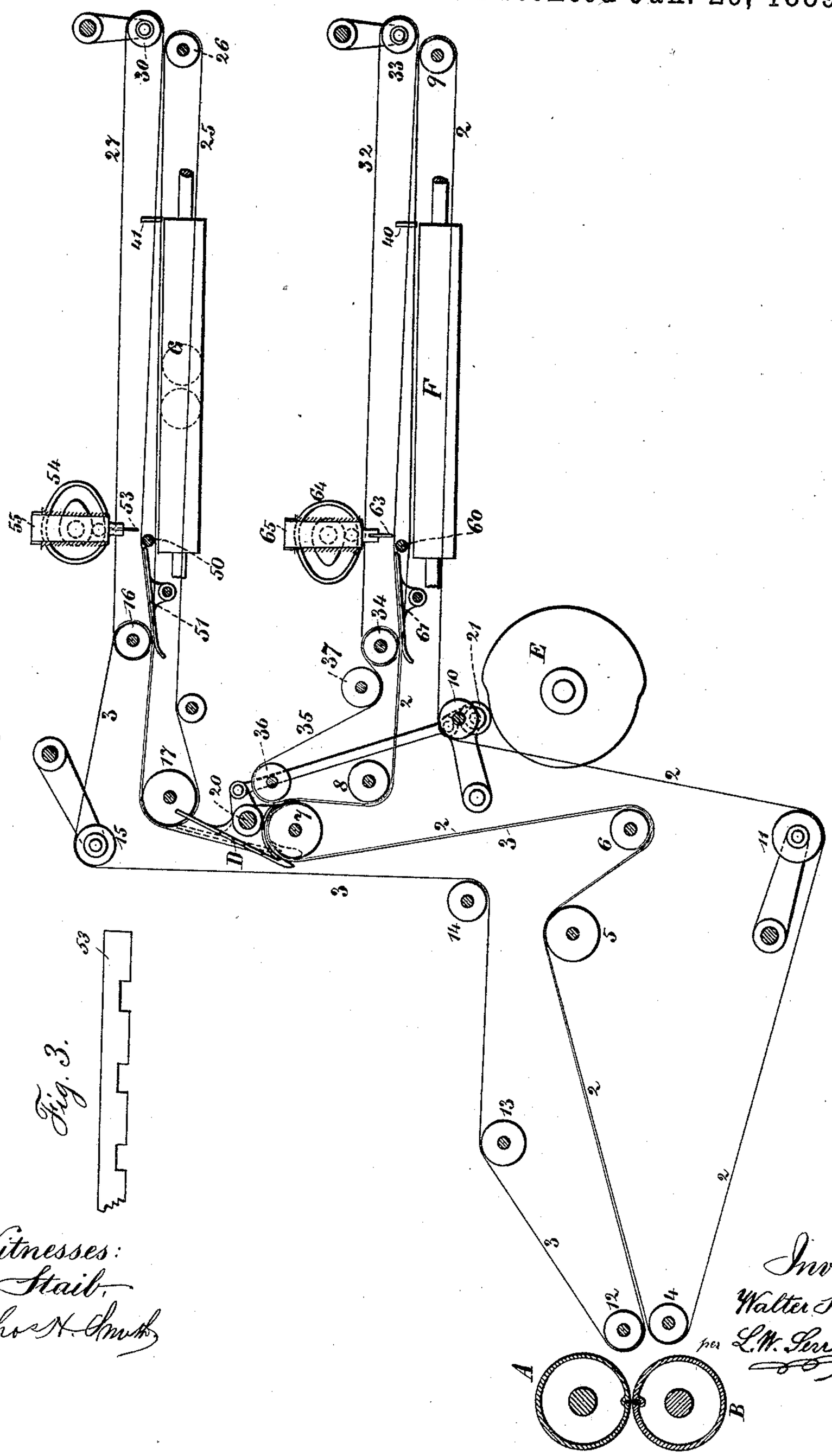

Fig. 1.

Fig. 3.

Witnesses:
J. Stahl.
Chas. H. Smith

Inventor:
Walter Scott
per L. W. Serrell
atty

(No Model.)

2 Sheets—Sheet 2.

W. SCOTT.

SHEET DELIVERY APPARATUS FOR PRINTING MACHINES.

No. 396,896. Patented Jan. 29, 1889.

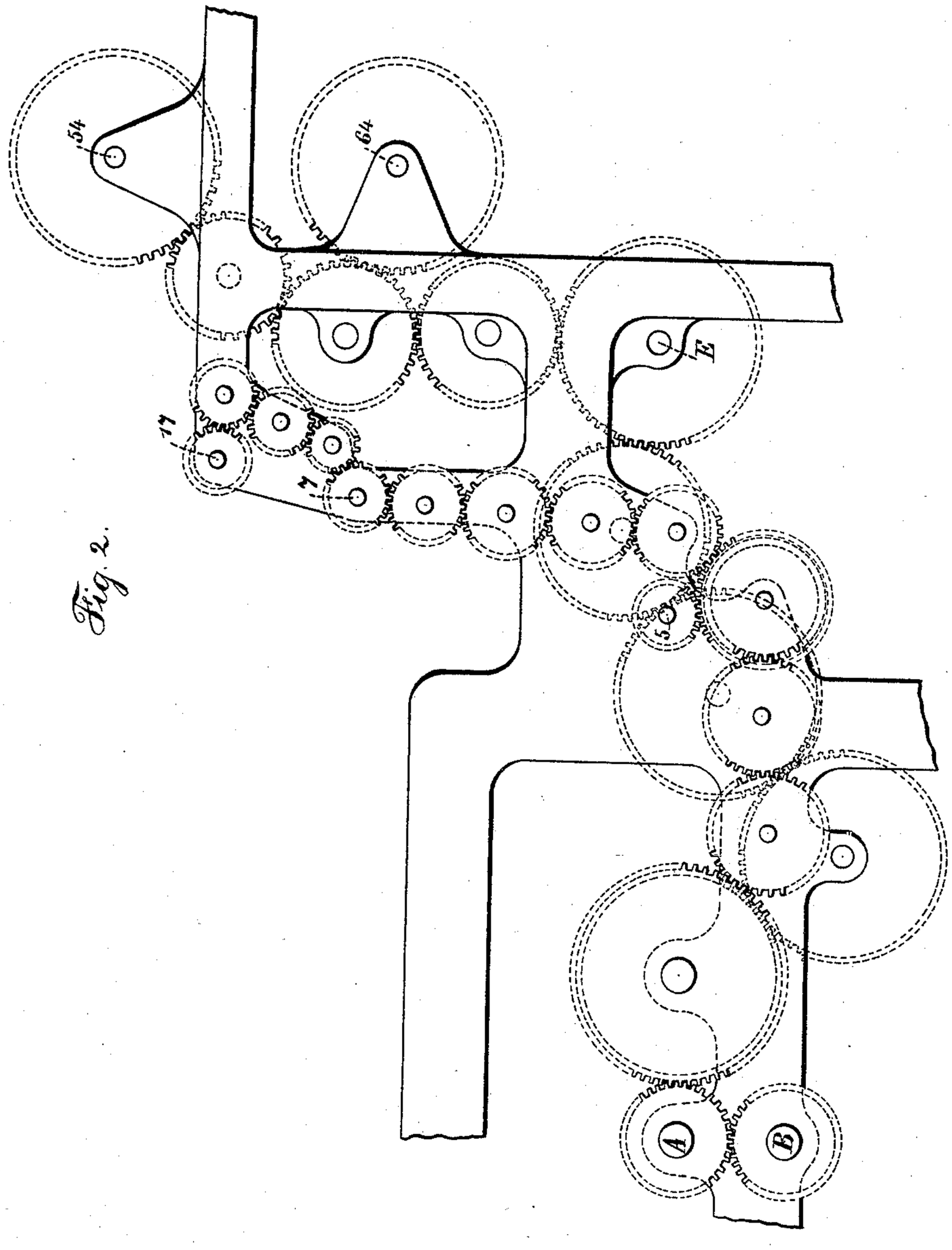

Fig. 2.

Witnesses:
J. Stair
Chas. H. Smith

Inventor:
Walter Scott
per Lemuel W. Serrell atty

UNITED STATES PATENT OFFICE.

WALTER SCOTT, OF PLAINFIELD, NEW JERSEY.

SHEET-DELIVERY APPARATUS FOR PRINTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 396,896, dated January 29, 1889.

Application filed March 2, 1888. Serial No. 265,921. (No model.)

To all whom it may concern:

Be it known that I, WALTER SCOTT, of Plainfield, in the county of Union and State of New Jersey, have invented an Improvement in Sheet-Delivery Apparatus for Printing-Machines, of which the following is a specification.

This invention applies to that class of printing-machines in which two sheets are printed at each rotation of the type-cylinder, and such sheets are cut apart and one sheet laid upon the other previous to the folding operation being performed.

In my present improvements the sheets are printed and cut as usual, and then they are conveyed away by tapes, two sheets being carried to one folding apparatus, and then the next two sheets are carried to the other folding apparatus, so that the necessary time elapses between the delivery of the pairs of sheets for the respective folding operations to be performed. Where one sheet is carried forward over the folding-rollers and beneath the folding-blade, difficulty has been experienced in introducing the next sheet, because the rear end of the first sheet is liable to catch the advancing end of the second sheet. In my present improvements the sheets are delivered over a roller or bar and pass along to place for folding upon tapes or rods, and as the rear end of the first sheet passes clear of the roller or bar depressing-fingers are made to act upon the rear end of such sheet to carry it down below the path of the advancing end of the next sheet, and the movement given to these fingers is instantaneous, so that the fingers are not in the way of the front end of the next sheet.

In the drawings, Figure 1 is a diagrammatic view representing the cutting-cylinders, conveying belts or tapes, and portions of the folding devices. Fig. 2 illustrates the gearing that may be made use of for giving motion to the respective parts, and Fig. 3 is a detached view of part of the blade forming the fingers 53.

The cutting-cylinders A and B are of ordinary construction, and they are usually half the diameter of the type and impression cylinders, so as to make two revolutions and cut the web into two sheets for each complete impression. The tapes or belts 2 and 3 are for conveying away the printed sheets. These tapes pass around rollers, as usual, to convey the sheets to the respective points of delivery, the tapes or belts 2 passing around the rollers 4, 5, 6, 7, 8, 9, 10, and 11, the rollers 10 and 11 being fitted, as usual, upon arms, so as to tighten the belts from time to time, and the tapes or belts 3 pass around the rollers 12 13 14 15 16 17 7 6 5, the rollers 15 being upon arms for tightening this range of belts 3.

It will be apparent that the tapes 2 and 3 pass together over the roller 5, and at this point the sheet is nipped, and the belts, traveling faster than the periphery of the cutting-cylinders, pull the one sheet away from the next, so as to separate and accelerate the sheets in succession, and such belts also pass together around the roller 6 and up to the roller 7, and above this roller 7 is a switch, D, upon the cross-rod or rock-shaft 20, which is moved periodically by a cam, E, and roller 21, so as to allow the sheets to pass around the roller 7 upon the belts 2 and below the roller 8 and over the folding-roller F, or else, when the switch D is in the position shown by dotted lines, the sheets are carried up by the belts 3 over the roller 17 and along by the belts 25 over the folding-rollers G. These belts 25 pass around the rollers 17 and along parallel to the folding-rollers G and around the pulleys 26, and there are also belts 27 passing around the rollers 16 and 30 to aid in conveying the sheets to the folding-rollers G.

It is to be understood that the respective rollers 7 16 17 are made of pulleys, so as to allow for the movements of the switch D and for the separate sets of belts as they pass off in different directions from one roller. I also make use of the sets of belts or tapes 32 passing around the rollers 33 34 and moving parallel, or nearly so, to the belt 2, where it passes from the roller 9 to the rollers 8 and 10, respectively, and I employ another set of belts, 35, passing around the rollers 34 8 36 37, so as to travel adjacent to the belts 2 between the rollers 7 8 34.

The cam E acts upon the switch D in such a manner that two sheets are allowed to pass around the roller 7, beneath the rollers 8 and 34, and over the folding-rollers F, and stop

against the fence 40, and the next two sheets are carried up over the switch D to the roller 17 and pass between the belts 3 and 25 to the roller 16, and thence between 25 and 27 along over the roller G to the fence 41.

The special feature of my present improvement relates to the cross-bar or roller 50 and the range of bars or guides 51, that slope up to the same, so that the sheets as they pass along successively between the ranges of tapes 25 and 27 pass over the bars 51 and across the roller or bar 50, and adjacent to this roller or bar 50 are the reciprocating fingers or blades 53, actuated by cams 54, that move the rollers and vertical slides 55, the said fingers or blades 53 being upon the cross-bar between the vertical slides 55, and the parts are so timed that at the moment the rear end of the first sheet passes over the cross-bar or roller 50 the fingers 53 are brought down upon the same to force the rear end of the sheet down below the top of this cross-bar or roller 50, and then these fingers 53 are instantly raised up again, so that the advancing end of the next sheet is free to pass under such fingers 53 and over the first sheet as it lies upon the tapes 25 with its front end against the fence or gage 41. In this manner I am able to pass one sheet over the other reliably, and to prevent the rear end of the first sheet interfering with the forward end of the second sheet, and there is a free space between the under side of the tapes 27 and the first sheet, as such first sheet lies upon the belts or tapes 25 and the rollers G, so that the second sheet is uninterrupted in its movement, and after it arrives at the fence or gage 41 the folding-blade is brought down to press the sheets in between the rollers G and fold the same, as usual in folding-machines. Precisely the same operation takes place upon the two sheets that are carried away between the belts or tapes 2 and 32. The roller or cross-bar 60 is above the folding-rollers F and between the tapes 2 and 32, and the inclined bars or guides 61 serve to elevate the sheet and carry it over the cross-bar 60, and the fingers or blades 63 act upon the rear end of the first sheet to press the same down adjacent to the cross-bar 60 and allow space for the advancing end of the second sheet, and the cam 64 gives motion to the slide 65 and the cross-piece carrying the fingers or blades 63.

It is preferable to make use of plates suitably notched at the places where the belts or tapes come in the respective ranges of belts to form the fingers or blades 53 63, so that the paper will be acted upon uniformly throughout its width, except at the places occupied by the tapes.

It will be understood that the printing-cylinders may contain more than two sets of plates or printing-surfaces, and that the switch D may be moved and timed so as to pass all the sheets cut off that form one signature to one set of folding-rolls, and then all the sheets that form the next signature to the other set of folding-rolls.

When the machine is not running at a high rate of speed, the sheets will descend sufficiently fast by gravity for the second sheet to be run in over the first without using the fingers 53; or a puff of air from a perforated pipe may be used in place of the fingers 53.

It will be apparent that the belts or tapes 3 may extend along and around the roll 30 in place of the separate belts 27, and that the belts 35 may extend along to and around the roll 33 in place of the separate belts 32.

The roller or cross-bar 50, over which the sheets are carried by the action of the belts, is not limited to any particular folding device, but may be used where the fence 41 is raised to let one group of sheets pass on to the folding mechanism and depressed to detain the next group of sheets.

In Fig. 2 I have represented trains of gearing that may be made use of for giving motion to the respective parts, and in this figure I have put upon the shafts for the respective gear-wheels the same letters of reference as are employed upon the respective rollers or cams, so as to identify the gear-wheels with the devices that are driven by them. I, however, do not limit myself to driving the parts by any such train of gearing, as the parts may be actuated in any suitable manner. It will be understood that, in place of the respective ranges of tapes or belts 25 and 27 and 2 and 32 at the folding-rollers F and G, stationary bars might be made use of, between which the sheets are caused to move, such bars being the known equivalents of the tapes or belts.

It will be apparent that the folding-rolls may occupy the position shown by dotted lines in Fig. 1, so as to stand at right angles to the positions represented in full lines.

I claim as my invention—

1. The combination, with the folding-rolls and fence and the tapes or belts for conveying the sheets to such folding-rolls, of the cross-bar or roller, the stationary guides or rods over which the sheets are passed, the fingers acting adjacent to the cross-bar, and the cams for giving the proper movements to such fingers, substantially as set forth.

2. The combination, with the folding-rolls and the fence for stopping the sheets, and the tapes for conveying such sheets to the folding-rolls, of the cross-bar or roll and the inclined rods or guides, over which one set of the tapes pass for moving along and delivering the sheets over the cross-bar or roller, substantially as set forth.

Signed by me this 29th day of February, 1888.

WALTER SCOTT.

Witnesses:
WILLIAM G. MOTT,
HAROLD SERRELL.