

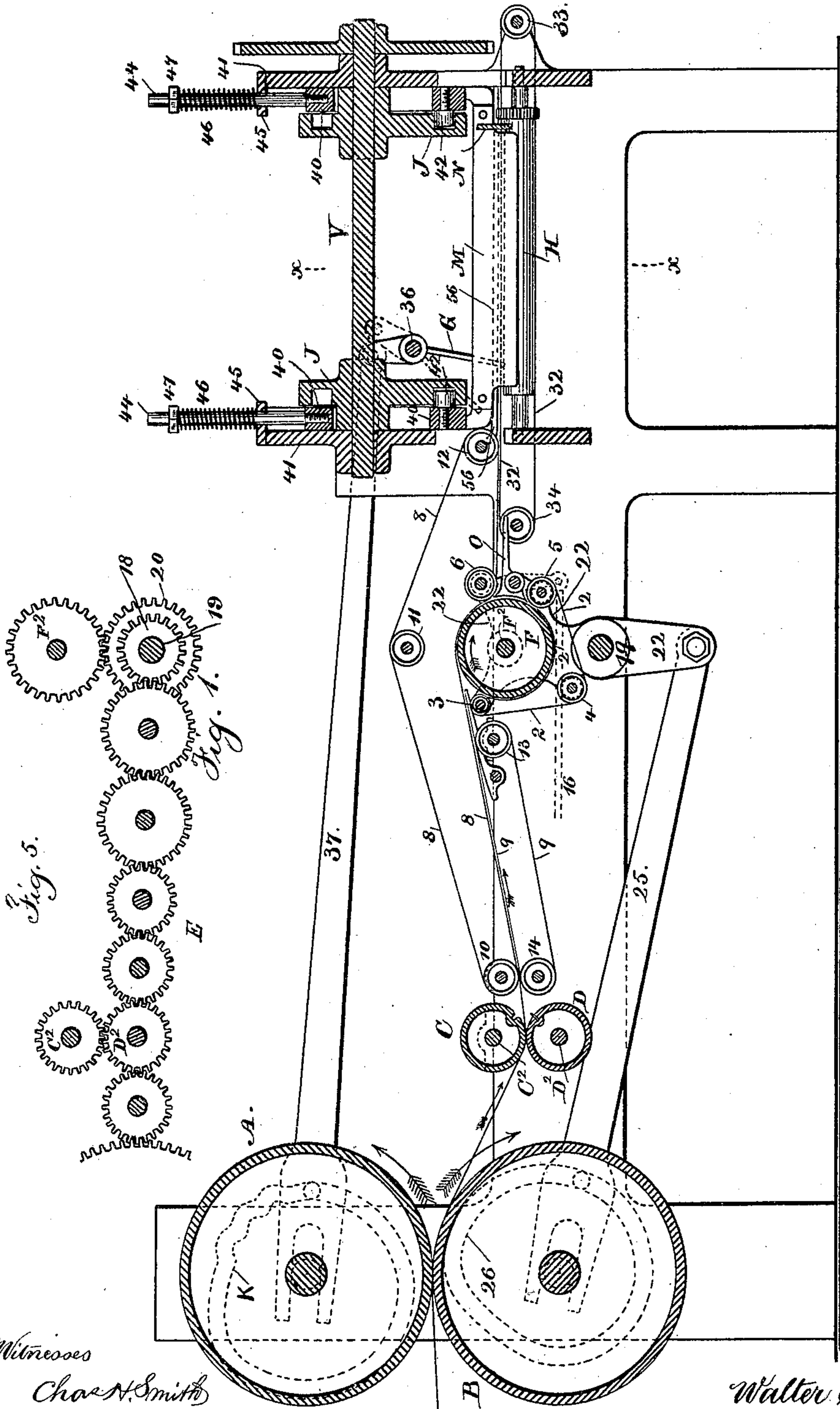
(No Model.)

2 Sheets—Sheet 1.

W. SCOTT.
MEANS FOR COLLECTING AND EVENING UP SHEETS FOR PRINTING
MACHINES.

No. 397,314.

Patented Feb. 5, 1889.



Witnesses

Chas. H. Smith
J. Hall

Inventor.

Walter Scott.
per Lemuel W. Serrell atty

(No Model.)

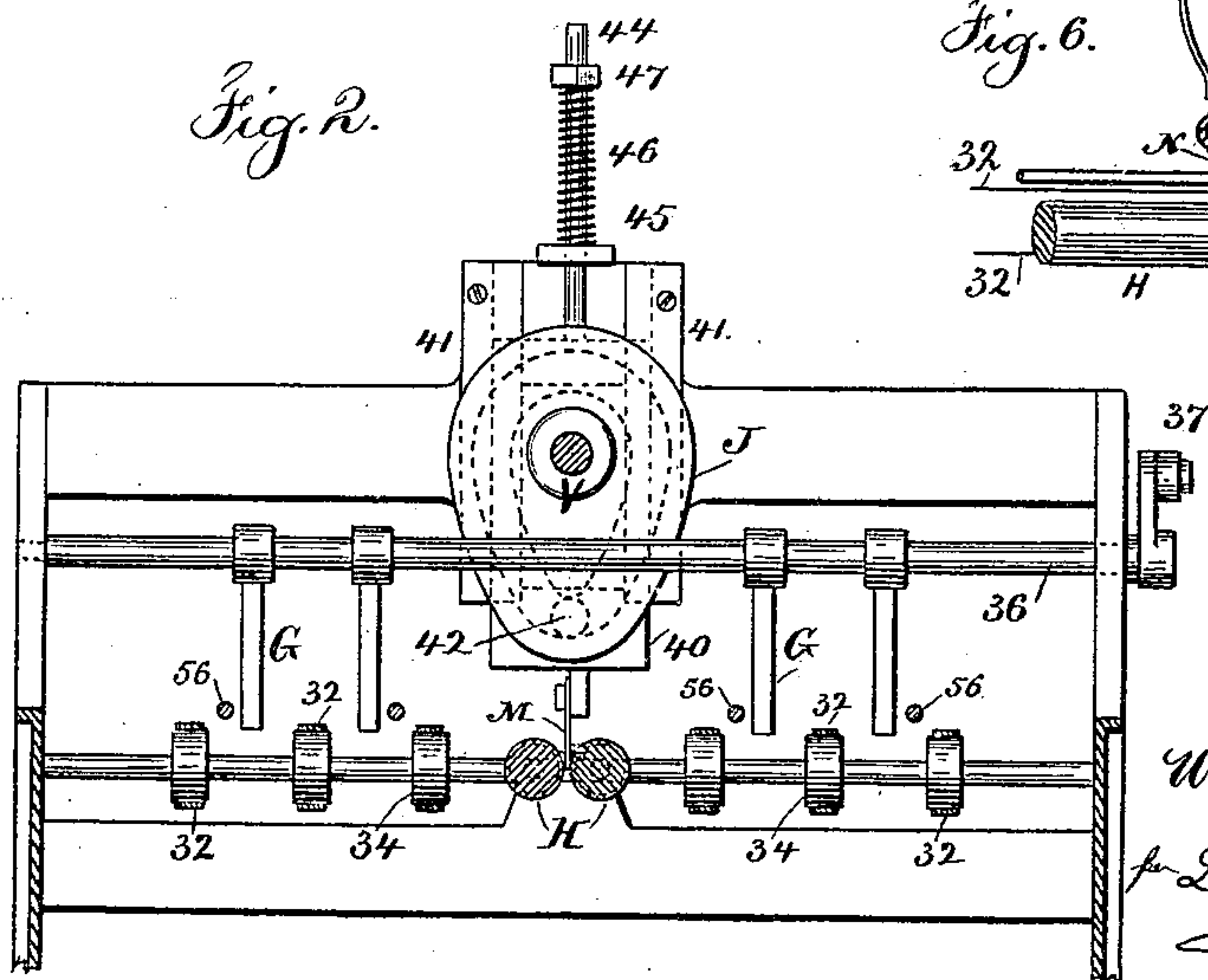
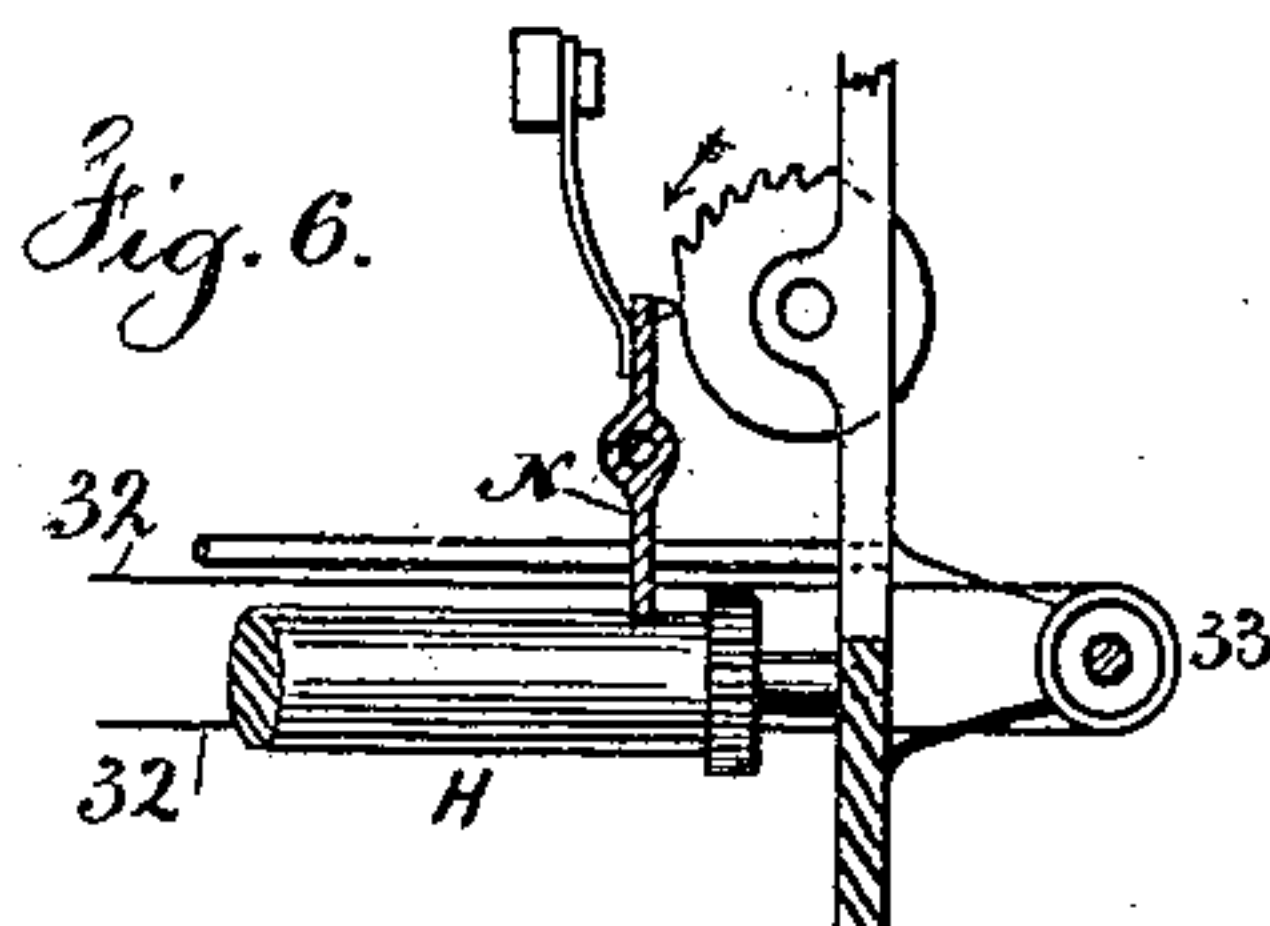
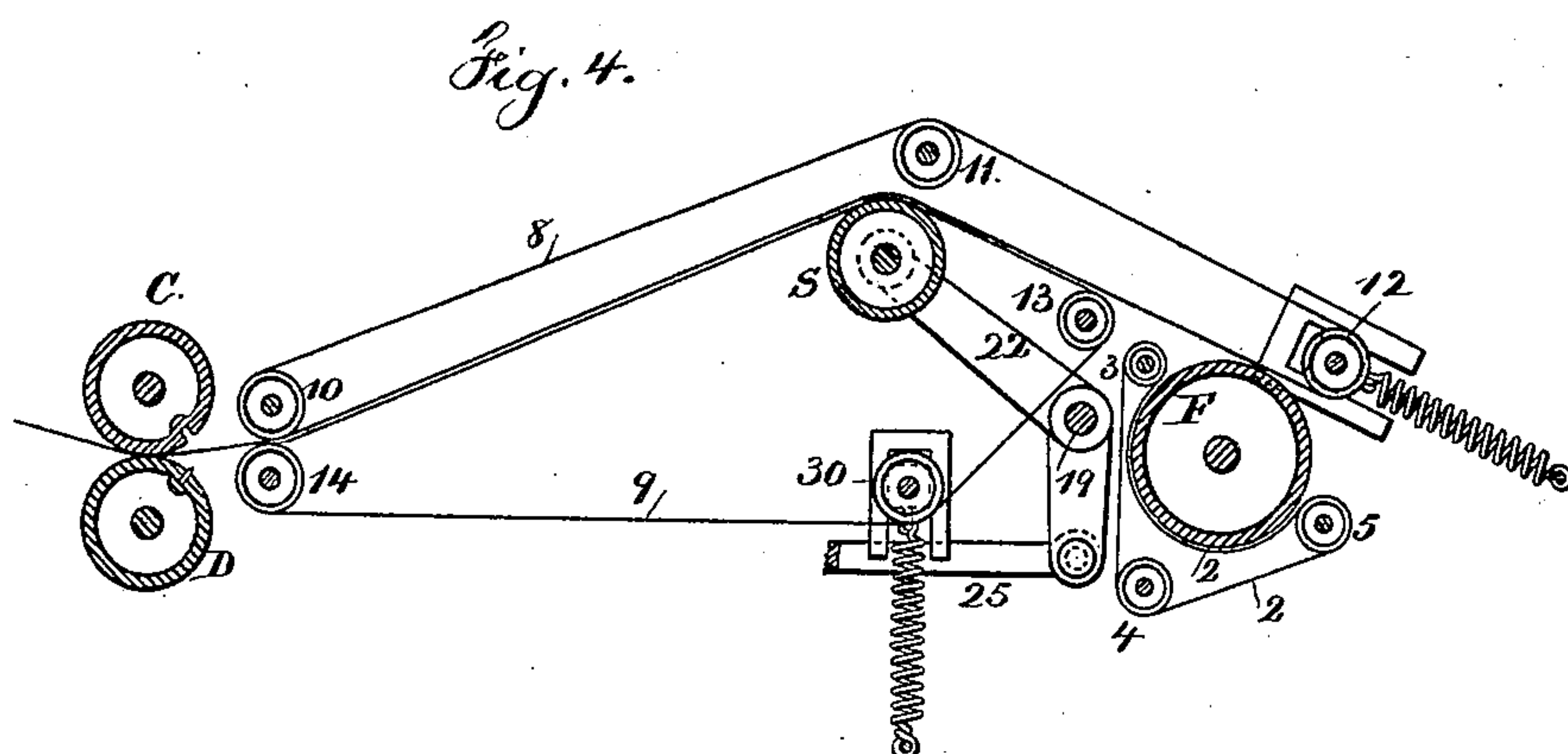
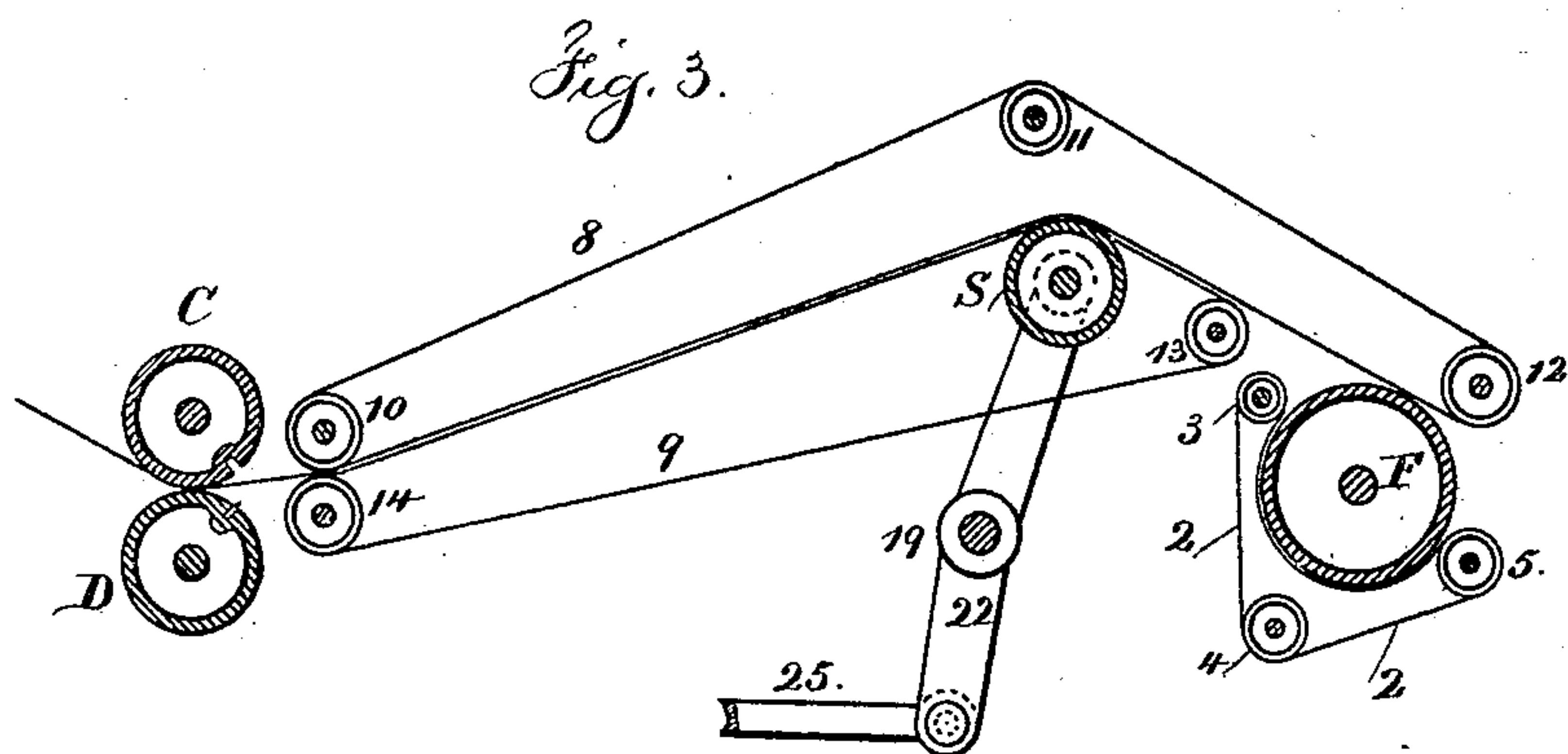
2 Sheets—Sheet 2.

W. SCOTT.

MEANS FOR COLLECTING AND EVENING UP SHEETS FOR PRINTING
MACHINES.

No. 397,314.

Patented Feb. 5, 1889.



Witnesses

Chas. H. Smith
J. Staib.

Inventor:

Walter Scott

for L. W. Ferrell

alt,

UNITED STATES PATENT OFFICE.

WALTER SCOTT, OF PLAINFIELD, NEW JERSEY.

MEANS FOR COLLECTING AND EVENING UP SHEETS FOR PRINTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 397,314, dated February 5, 1889.

Application filed November 21, 1887. Serial No. 255,714. (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 Means for Collecting and Evening Up Sheets for Printing-Machines, of which the following is a specification.

Printing-presses have been made in which the sheets as delivered are imposed or laid one upon the other and passed in a group to the folding apparatus. In presses of this kind I have found that the second imposed sheet is generally slightly to the rear of the first sheet, and so on, their forward edges not exactly coinciding. This arises partly from the fact that the cylinder around which the first sheet is wrapped is thereby increased in diameter and the front edge of the second sheet comes slightly behind the edge of the first sheet, and so on.

The object of my invention is to gradually lessen the time consumed in passing the sheet from the cutting-cylinders to the imposing-cylinder while collecting each group of sheets, so that the forward edges of such sheets are exactly in line with each other, and in addition to this I even up the group of sheets while laying out flat and before the folding-blade commences to act upon the same, thereby bringing all the sheets exactly into the proper position and obviating any difficulty that might arise from the conveying-belts slightly disarranging the sheets or changing the relative positions of one to the other previously to folding the same.

In the drawings, Figure 1 is a diagrammatic elevation illustrating my improvements. Fig. 2 is a cross-section of the folding device at the line *xx*, Fig. 1; and Figs. 3 and 4 illustrate modifications in the arrangements of the belts and devices that convey the sheets to the imposing-cylinder. Fig. 5 is an elevation of the gearing that drives the cutting and collecting cylinders, and Fig. 6 is a detached view of a modification of the eveners.

The impression-cylinder is represented at A, and the plate or type cylinder at B, and the cutting-cylinders C and D are provided with a slot and knife, respectively, of any usual character, for perforating the web of paper. The cutting-cylinders C and D are upon the shafts C² and D², respectively. These

cutting-cylinders C D are shown of one-quarter the diameter of the type-cylinder B, so as to be adapted to cutting up the printed web into four pages or sections each revolution of the type-cylinder; but the proportion may vary according to the number of sheets to be grouped together and form one signature in the folding apparatus.

The imposing or collecting cylinder F is upon a shaft, F², and is adapted to receive two, three, or more printed sheets and deliver the same when the proper number have been collected or grouped together. This imposing-cylinder may be of any desired construction and provided with penetrating-points or gripping-fingers, as are well known. I have, however, shown a plain cylinder and provided endless belts 2, running around the pulleys 3 4 5, and against the portion of the periphery of the said cylinder, so as to hold the sheets in place as they are accumulated.

The belts 8 and 9, passing around the pulleys 6, 10, 11, 12, 13, and 14, respectively, serve to convey the punctured web from the cutting-cylinders C D to the collecting-cylinder F, and the belts 8 press the web of paper toward the cylinder F, and each sheet is separated from the web when the forward end comes in contact with the collecting-cylinder F, the speed thereof being greater than the speed of the cutting-cylinders C D, thereby tearing the sheet off the web at the punctures the moment the front edge of such sheet is nipped by the belt 8 against the top surface of the cylinder F. After the proper number of sheets has been accumulated the switch O causes the delivery of such sheets to the folding apparatus, hereinafter described, such switch being swung at the proper time by a cam or other suitable device acting upon the rod 16 of the crank upon the shaft of the switch, as usual.

The collecting-cylinder F is rotated, preferably, by a train of gears, E, from the cutting-cylinders C D, as indicated in Fig. 5, there being a smaller wheel, 18, upon the shaft 19 and a larger wheel, 20, gearing into the wheel on the shaft F² of the collecting-cylinder F, so that this cylinder F has a greater surface speed than the cutting-cylinders C D.

Upon the shaft 19 are lever-frames 22, carrying the journals of the collecting-cylinder

F, and also of the rollers 3 4 5 6 and switch O, so that these parts can all be swung upon the shaft 19, and there is a connecting-rod, 25, with a pin in the cam 26 upon the axis of the type-cylinder B, by which the frames 22 and the collecting-cylinder F can be swung forward and backward each revolution of the printing-cylinder, and the shape of the cam 26 is to be such that the first sheet of the group of sheets will reach the collecting-cylinder F when the same is farthest away from the cutting-cylinders C D, and then the said collecting-cylinder F will be swung toward the cutting-cylinders C D the proper distance to cause the front end of the second sheet to coincide exactly with the front end of the first sheet, and this operation will be continued for the third and fourth sheets, or for as many sheets as there are in the group, after which the group of sheets is delivered and the collecting-cylinder will be swung away from the cutting-cylinders C D ready to commence receiving another set or group of sheets.

It will be thus seen that the distance between the collecting-cylinder and the cutting-cylinder is lessened each sheet of the group of sheets, and then the distance is increased to the normal position as each group of sheets is delivered, so that the collecting-cylinder is in position for receiving the first sheet of the next group. It is not necessary to move the collecting-cylinder F, as the same effect is produced by shortening the distance traveled by the sheet or the time consumed in the movement of the sheet, as illustrated in Figs. 3 and 4.

In Fig. 3 the roller S is upon the lever or frames 22 at the ends of the shafts 19, and the connecting-rod 25 passes to the cam 26, as before, and the roller S is thereby moved toward or from the cutting-cylinders C D, and the belts 8 and 9, passing over and against this roller S, nip the sheet and tear the same from the web at the perforations, and the sheet is accelerated thereby and passes to the collecting-cylinder F, which cylinder remains in a fixed position. Hence as the roller S is moved toward the cutter C D the second sheet will be caught and accelerated at an earlier period than the first sheet, and so on for the third and fourth sheets, and according to the extent of motion given to the roller S between the nipping of one sheet and the next, so the sheet will reach the collecting-cylinder F sooner or later, and its front edge can be thereby made to coincide with the front edge of the previous sheet or be lapped thereon, if desired.

The before-described object can be effected by shortening the length of the belts 8 and 9 between the cutting-cylinders C D and the collecting-cylinder F progressively, to lessen the distance traveled by the sheets in succession. With this object in view the rollers 12 and 30 should be mounted in spring-bearings to allow them to yield as the nipping-roller S

is moved away from the cutting-cylinders C D, and to take up the slack in the reverse direction.

The group of sheets as delivered from the collecting-cylinder F, by the switch O passes beneath the rods 56 and upon the belts 32, that are around the rollers 33 34, and by them they are conveyed up to the gage or stop N, and during this movement the vibrating fingers G have been swung back out of the way. These fingers G are upon a cross-shaft, 36, that is provided with a crank and connecting-rod, 37, to a cam, K, preferably upon the shaft of the impression-cylinder A. The shape of this cam is such that the fingers occupy the position indicated by dotted lines until after the group of sheets has passed along beneath them, and then the said fingers are brought up against the rear edges of the sheets and rapidly swung back and forth by the corrugated portion of the cam K, so as to straighten up and even the sheets, causing the front edges of them all to come into contact with the stop N, after which the folding blade M is brought down to carry the center of the group of sheets in between the folding rollers H, and deliver such group of sheets as a signature ready for binding, or such group as folded passes to any suitable apparatus for giving additional folds.

The stop N may be hung on pivots and made to vibrate by a cam or other suitable device, as illustrated in Fig. 6, to aid in evening up the sheets as they lie one on the other. In this case the stop N becomes the vibrating eveners.

The folding-blade M is connected at its ends to the slides 40, which move in vertical slides ways 41 upon the frame of the machine, and there is a revolving shaft, V, upon which are grooved cams J, receiving pins or rolls 42 upon the respective slides 40, so as to force down the folding-blade M suddenly and at the proper moment to fold the sheets after they have been properly evened up against the stop N.

It is preferable to employ rods 44, sliding through guides 45 and having around them springs 46, that act against the nuts 47 to counterpoise the slides and folding-blade and cause the movement of the parts to be more uniform.

By making use of the cam J, acting directly upon the slides of the folding-blade, I am enabled to move such folding-blade rapidly after the sheets have been evened up for forcing them through between the folding-rollers H, and the motion given to the blade will be more steady and accurate in consequence of the cams acting directly at the ends, and the folds will be even and accurate, and there will be the necessary time for the delivery of such sheets and for the rising of the folding-blade before the next group of sheets is delivered from the collecting-cylinder.

The cutter upon the cylinder D may entirely separate the sheet instead of simply

perforating it, and rods may take the place of some of the tapes or belts, as well-known in printing-presses.

The evening-up fingers act upon the sheets as they lie in position immediately before the folding operation regardless of the position of the folding-rollers to the fingers.

I claim as my invention—

1. The combination, with the type and impression cylinders and the cutting-cylinders, of the collecting-cylinder and the rollers and tapes or belts for conveying the sheets from the cutting-cylinders to the collecting-cylinder, and mechanism, substantially as specified, for discharging the groups of sheets successively from the collecting-cylinder, one of the rollers or cylinders being movable laterally during the gathering of each group of sheets to lessen the time occupied in the travel of the respective sheets of the group from the cutting-cylinders to the collecting-cylinder, so as to bring the ends of all the sheets in the group of sheets in line with each other upon the collecting-cylinder, substantially as set forth.

2. The combination, in a press for printing from a web of paper, of cutting-cylinders for perforating the paper, a collecting-cylinder, and belts for conveying the paper from the cutting-cylinder to the collecting-cylinder, the swinging lever-frames 22 and shaft 19, carrying the same, the connecting-rod 25, and cam 26, for swinging such frames progressively during the delivery of each group of sheets and varying the delivery of the respective sheets in the group to bring their ends into line with each other upon the collecting-cylinder, substantially as set forth.

3. The combination, with the cutting-cylinders C D and the delivery-belts 8 and 9 and their rollers, of a collecting-cylinder, F, the belts 2, passing partially around the same, the rollers for carrying such belts 2, the lever-frames 22 and their shaft 19, for supporting the collecting-cylinder, and mechanism, substantially as specified, for swinging the lever-frames gradually during the collection of each group of sheets to bring the collecting-cylinder nearer to the cutting-cylinders, and thereby insure the proper position of the sheets one upon the other in the group of sheets around the collecting-cylinder, substantially as set forth.

4. The combination, with the cutting-cylinders, the collecting-cylinder, the conveying belts and rollers, and a switch for delivering the groups of sheets from the collecting-cylinder, of conveying-belts for receiving the sheets from the collecting-cylinder, a stop, N, against which the front edges of the sheets are arrested, and vibrating fingers acting against the rear edges of the sheets to even up the same, substantially as set forth.

5. The combination, with the belts 32 and

their rollers, of the stop N, vibrating fingers G, shaft 36, carrying the same, connecting-rod 37, and cam K, for vibrating the fingers, and a folding-blade, M, and rollers H, for folding and delivering the groups of sheets, substantially as set forth.

6. The combination, with the folding-blade M, of the pair of slides 40, supporting the folding-blade, and the pair of slideways 41 on opposite sides of the frame of the machine, and the revolving shaft and cams, also upon opposite sides of the machine, for moving the slides and blade, and the folding-rollers H, substantially as set forth.

7. The combination, with the folding-blade M, of the slides 40, supporting the folding-blade, the slideways 41 on the frame of the machine, the cams J, and revolving shaft 36, for moving the folding-blade, and the rods and springs for counterpoising the folding-blades and slides, substantially as specified.

8. The combination, in a paper-folding machine, of the rollers H H, the folding-blade M, the parallel line of vibrating fingers G, acting on one edge of the sheets, and mechanism, substantially as specified, for giving motion to the parts, and the stop N, whereby the sheets after being superimposed are evened up and folded, substantially as set forth.

9. The combination, with the type and impression cylinders and the cutting-cylinders, of the collecting-cylinder and the rollers and tapes or belts for conveying the sheets from the cutting-cylinders to the collecting-cylinder, and mechanism, substantially as specified, for discharging the groups of sheets successively from the collecting-cylinder, one of the rollers or cylinders being movable laterally during the gathering of each group of sheets to lessen the time occupied in the travel of the respective sheets of the group from the cutting-cylinders to the collecting-cylinder, so as to bring the ends of all the sheets in the group of sheets in line with each other upon the collecting-cylinder, and the folding-blade M, the rollers H, and a stop, N, for folding the groups of printed sheets, substantially as set forth.

10. The combination, with mechanism, substantially as specified, for collecting and superimposing sheets of paper, of the folding-blade and rollers, a vibrating evenner acting at the front and back edges of the sheets after they are superimposed to cause said sheets to coincide with each other, substantially as set forth.

Signed by me this 16th day of November, 1887.

WALTER SCOTT.

Witnesses:

GEO. T. PINCKNEY,
WILLIAM G. MOTT.