

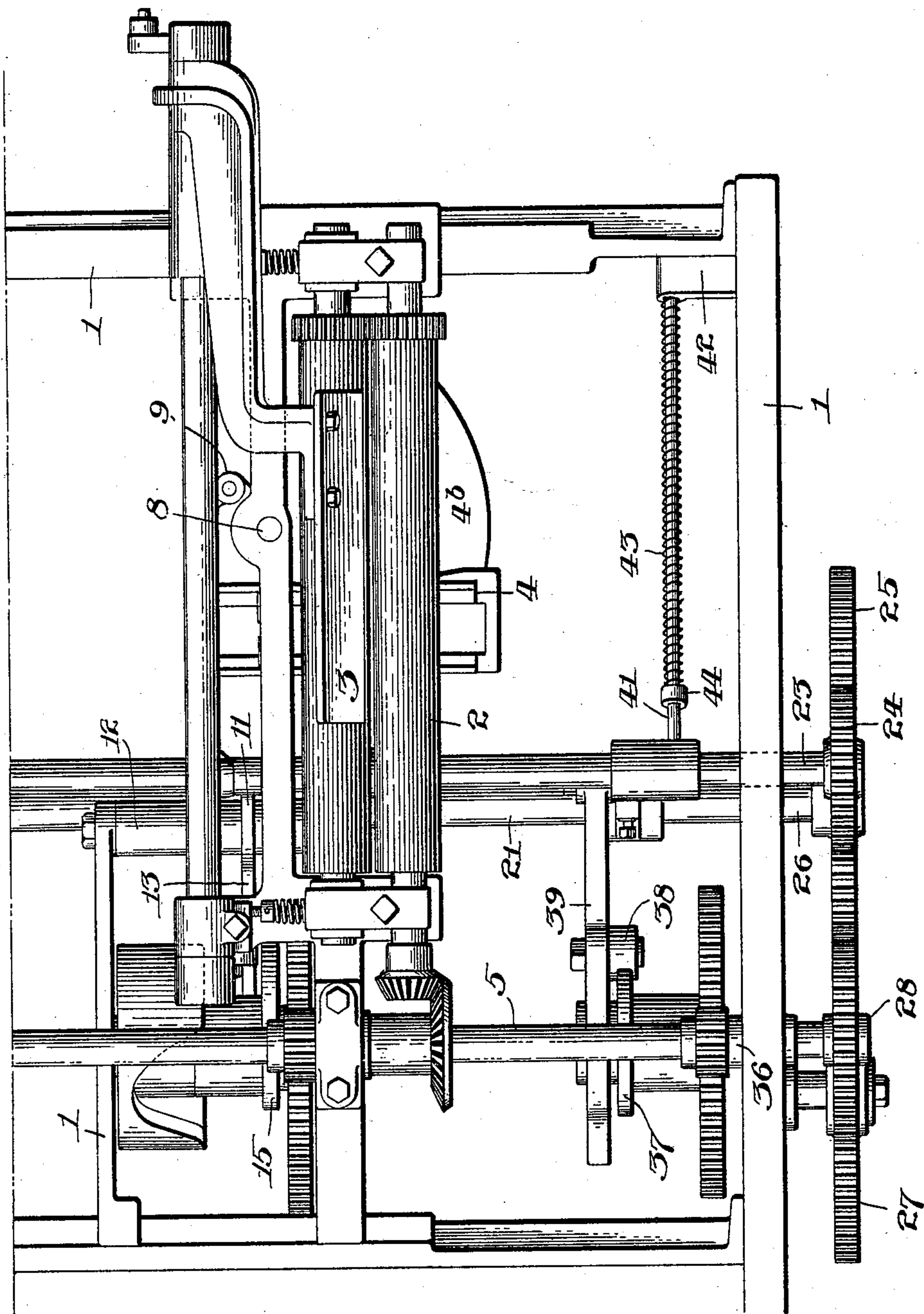
(No Model.)

3 Sheets—Sheet 1.

J. GILL.
PAPER FOLDING MACHINE.

No. 594,245.

Patented Nov. 23, 1897.



Witnesses.

Walter C Pusey.
Fred Taylor Pusey

Fig. 1.

Inventor.

James Gill,
per Joshua Pusey,
Attorney.

(No Model.)

3 Sheets—Sheet 2.

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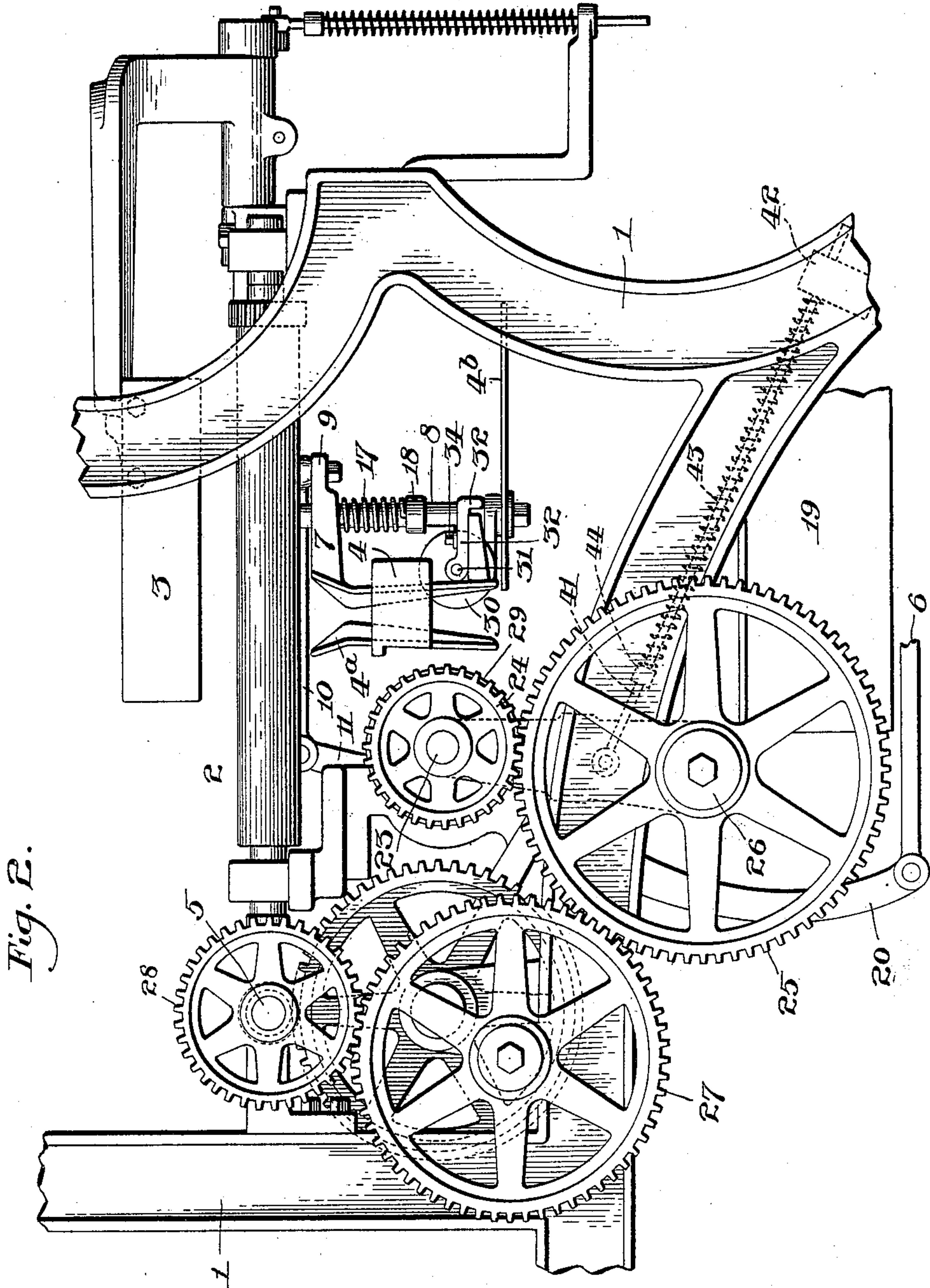


Fig. 2.

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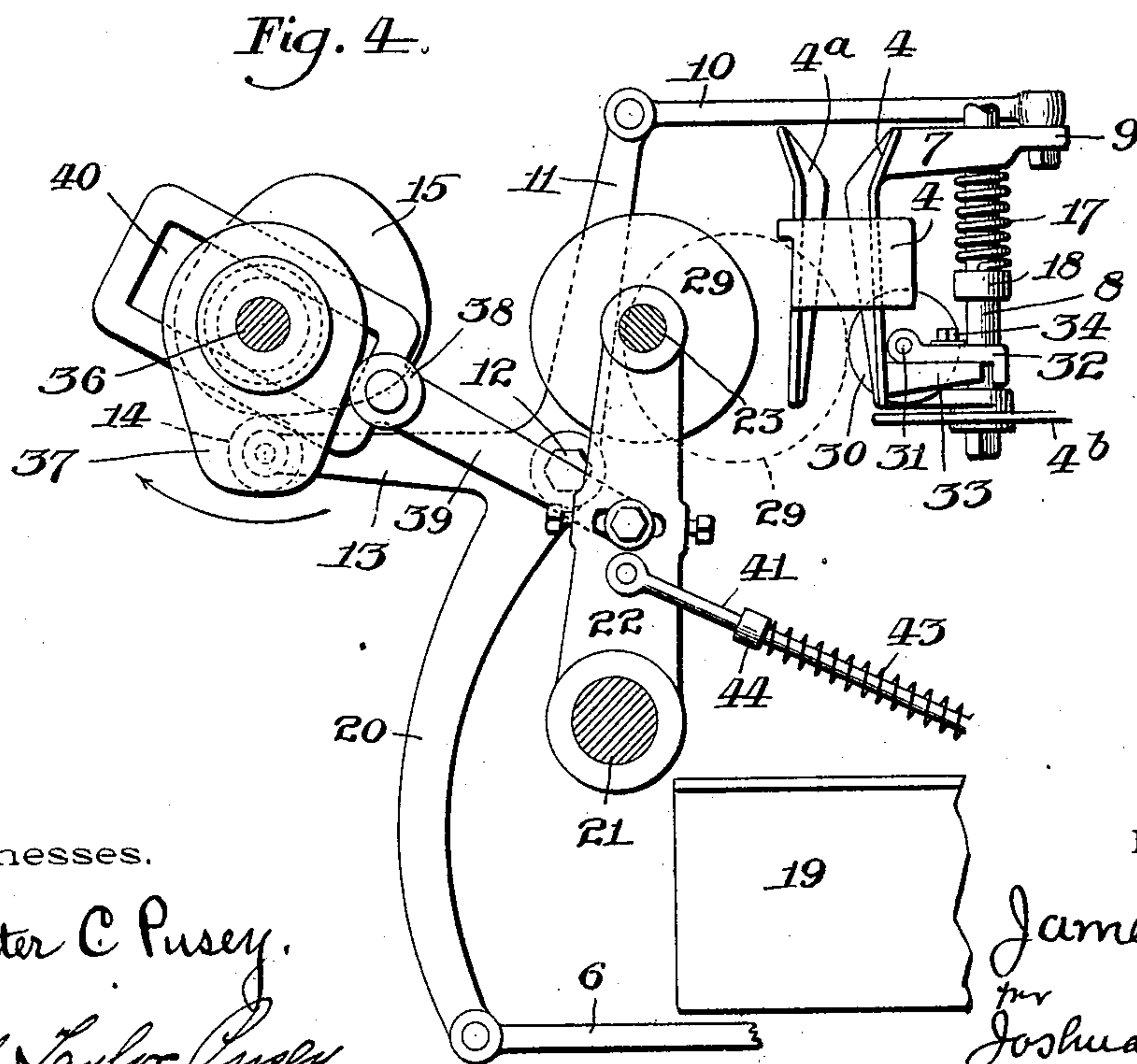
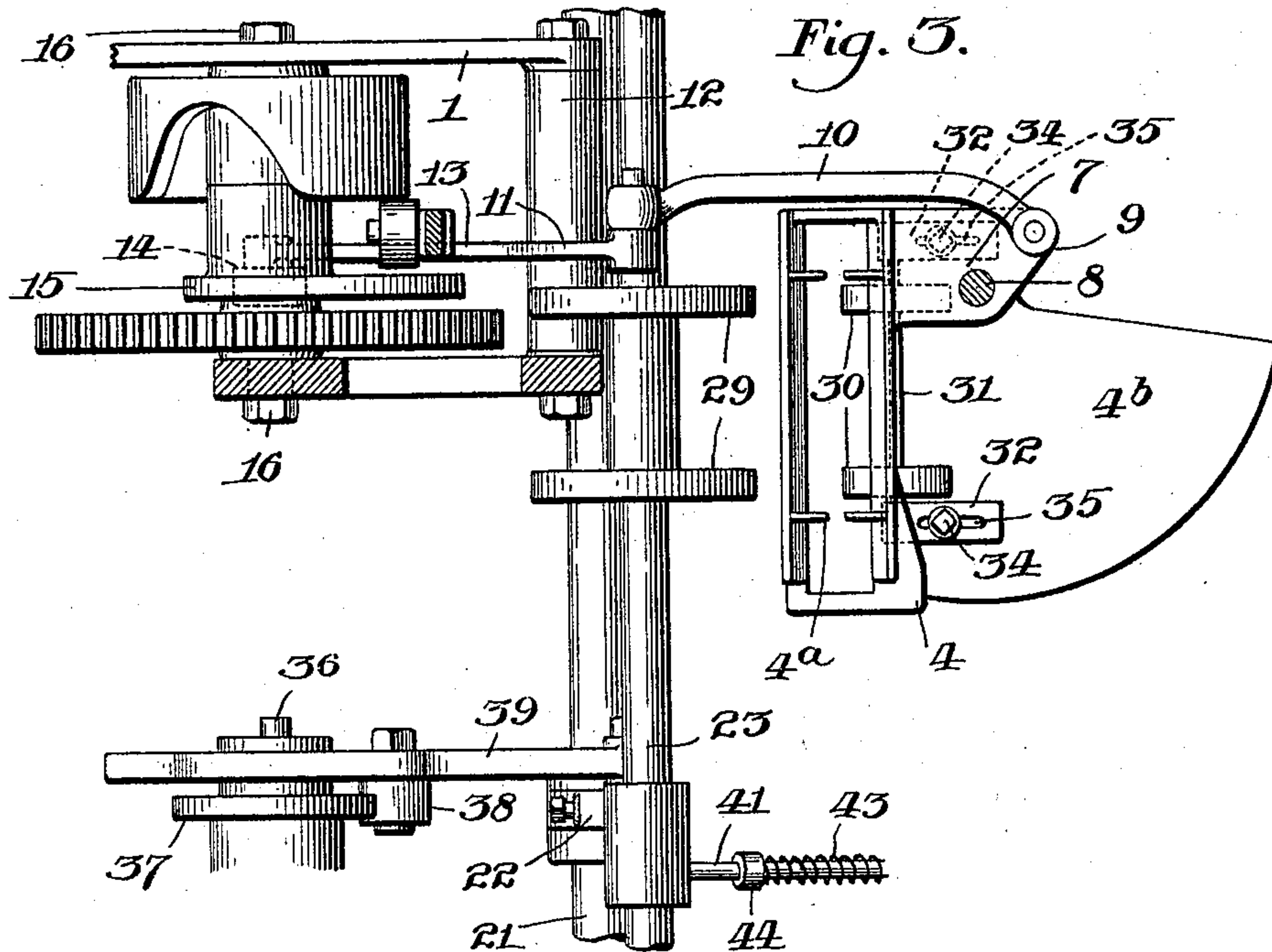
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3 Sheets—Sheet 3..

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UNITED STATES PATENT OFFICE.

JAMES GILL, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE
CHAMBERS BROTHERS COMPANY, OF SAME PLACE.

PAPER-FOLDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 594,245, dated November 23, 1897.

Application filed January 29, 1897. Serial No. 621,219. (No model.)

To all whom it may concern:

Be it known that I, JAMES GILL, a citizen of the United States, residing at the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Paper-Folding Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, of which—

10 Figure 1, Sheet 1, is a general plan view. Fig. 2, Sheet 2, is a side elevation of Fig. 1. Fig. 3, Sheet 3, is a plan view, partly in section, of the shoo-fly and parts relating thereto. Fig. 4 is a side elevation, partly in section,
15 of Fig. 3.

This invention relates to folding-machines wherein the folded sheet of paper or signature passes from the last pair of folding-rollers into a device known as a "shoo-fly,"
20 which turns the signature at right angles, or thereabout, as it leaves the said rollers and delivers it (the signature) to the subjacent packing-trough. Heretofore it frequently happened that the signature stuck in the
25 shoo-fly, and consequently did not descend into the packing-trough; also, when the shoo-fly swung back into position to receive the succeeding signature from the folding-rollers the preceding one that had stuck fast in the
30 shoo-fly clogged the latter, or, having descended some distance, was caught between the oscillating shoo-fly and its fixed base-plate and thus became torn or mutilated.

The object of my present invention is to
35 avoid the foregoing results, which I do by carrying down the signature from the shoo-fly to the packing-trough positively at the proper time by means of a simple and efficient mechanism which I shall now proceed to describe, reference being had to the accompanying
40 drawings, in which—

1 marks the frame of well-known form of folding-machine; 2, the last set of folding-rollers; 3, the usual folding-blade for tucking
45 the sheet to be finally folded into the bite of said rollers. The mechanism for driving the latter and for reciprocating the folding-blade being well known requires no particular description.

50 4 is the shoo-fly, which is similar in general construction and operation to the shoo-flies

in common use—that is to say, it consists of a pivoted transfer-box 4^a, open at the top and bottom, with its mouth normally in line with the folding-rollers 2, with means for swinging
55 it on its pivot in the arc of a circle, so as to bring the same into position to deliver into the subjacent packing-trough, together with a quadrant-table 4^b, upon which the lower edge of the folded sheet drops as it leaves the
60 folding-rollers.

5 is the shaft, that is rotated by power applied thereto, and which through the medium of suitable gears and connections actuates the folding-rollers, the folding-blade, the
65 packing-trough plunger-rod 6, the shoo-fly, and the mechanism combined with the latter, whereby the result which is the object of my present invention is accomplished.

The transfer-box arm 7 is pivoted upon a
70 vertical rod or standard 8, whose upper end is fixed to the frame of the machine. To an extension 9 of the said arm is pivoted one end of a bar 10, whose other end is pivoted to an upwardly-extending arm 11, Figs. 3 and 4,
75 that is fulcrumed on a stud 12, secured to the side of the machine-frame. Extending horizontally from the hub of the said arm 11 is a second arm 13, having at its free end a roller 14, (shown in dotted lines in Figs. 3 and 4,)
80 that bears against the face of a cam 15, of the form and in the relative position shown, upon a shaft 16, which shaft is rotated in the direction of the arrow in Fig. 4 by suitable gears connected with the driving-shaft. The said
85 cam in its rotation actuates the arm 13, and consequently through the arm 11 and its described connection with the transfer-box swings the latter against the stress of a spring
90 17 upon rod 8, one end of which spring is connected to the arm 7 of the transfer-box and its other end to a collar 18 upon said rod from its position for receiving the folded sheet from the rollers 2 into the position shown in the
95 drawings for delivery to the packing-trough 19. As the cam continues its rotation the said spring returns the transfer-box to the former position. To the hub of arm 11 is also secured a depending arm 20, to whose lower
100 end is pivoted the rod 6 of the packing-trough plunger, (not shown,) which latter is also actuated by the movement of the cam 15.

Fulcrumed on a horizontal shaft 21, that is secured to the machine-frame and is at right angles to and below the plane of the folding-rollers 2, is an arm or arms 22, in the upper or free end of which is journaled a horizontal shaft 23, upon which is a gear 24, that engages a larger idler-gear 25 on the end of a shaft 26. The latter gear engages a gear 27, which in turn engages a gear 28 on the driving-shaft 5.

Upon the shaft 23 of the small gear 24 are two disks or rollers 29, that are in line with slots (not shown) in the adjacent side wall of the transfer-box when the latter is in the position shown in the drawings—that is to say, in position for delivering the folded sheet to the packing-trough. 30 are two rollers in line with and similar to rollers 29, except that in the present instance they are of less diameter than the latter. A portion of these rollers projects through slots in the side of the transfer-box, into the latter to a point about in line with the vertical axis of the box. Rollers 30 are carried by a shaft 31, that is journaled in bearings of plates 32, that are secured to lugs 33 of that side of the transfer-box. I usually secure said plates by means of bolts 34, that for purposes of adjustment pass through elongated slots 35, Fig. 3, in the plates.

Upon a rotatable shaft 36, driven by a gear engaging a gear on the driving-shaft, is a cam 37 of suitable shape, as shown, against the face of which bears a roller 38 on an arm 39, that is secured to arm 22 at a point some distance above the fulcrum of the latter. The said arm 39 is enlarged at its free end and is provided with a slot 40, through which the shaft 36 passes, thus forming a guide and support for that end of the arm. To the arm 22 is also connected one end of a rod 41, whose other end is adapted to slide in an aperture in a lug 42 of the frame of the machine. Said rod has thereon a normally open helical spring 43, one end of which bears against a collar 44 on the rod and the other end against the inner side of the lug 42.

Having thus described the construction, I shall now proceed to describe the mode of operation of my invention, which is as follows:

Assuming that the working parts have arrived at that point in the operation of the machine when the transfer-box, through the action of cam 15 and its connections, has been rotated against the stress of spring 17 to the position in line with the bite of the folding-rolls, and that the folded sheet has descended into said box, now as the said cam continues its rotation, the eccentric part of its face moving out of the way, the spring 17 causes the transfer-box to swing on its pivot, carrying the sheet with it, to the position shown in the drawings, for delivering the sheet to the packing-trough below. Of course the rollers 30 follow the movement of the transfer-box. About coincident with the arrival

of the latter in the last-mentioned position the rotating cam 37, bearing upon the roller of the arm 39, (which, it will be remembered, is secured to the arm 22, that carries the shaft of gears 24 and disk or roller 29,) oscillates forward the said arm 22 and advances the rollers 29 toward the transfer-box until they come in contact with the opposite rollers 30, or rather in contact with the folded sheet, which is then in the bite of the opposed rollers. As the arm 22 is fulcrumed on the shaft 21; the teeth of the gear 24 keep in engagement with those of the large gear 25, and as the latter is continuously rotating in the direction of the arrow the former gear and so its shaft 23, and consequently the roller 29, are rotated forward. Thus the folded sheet is carried positively down until, escaping from the bite of rollers 29 and 30, it falls into the packing-trough. The arm 22 is then swung back by the stress of the spring 43, and rollers 29 are retracted from the transfer-box, finally reaching the position shown in the drawings. Shortly after the said rollers move out of the slots in the transfer-box the rotating cam 15 carries the latter back into position for the reception of a folded sheet coming from the folding-rollers.

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

1. In a folding-machine of the class recited, the combination of the folding-rollers and the shoo-fly, the rollers journaled to and projecting into the transfer-box of the latter, and the opposed coacting rollers; together with means for reciprocating the same at predetermined intervals, contiguous to and away from the first-mentioned rollers, substantially as and for the purpose set forth.

2. In a folding-machine of the class recited, the combination with the folding-rollers and the shoo-fly of the rollers journaled to and projecting into the transfer-box of the latter, means for swinging said box on its pivot, at predetermined intervals, the shaft having the rollers, 29, opposed to the first-mentioned rollers, the pivoted arm, 22, to which said shaft is journaled, the arm, 39, connected to arm, 22, the shaft, 36, carrying the cam adapted to impinge against arm, 39, means for imparting a rotary motion to said shaft and arm; together with the spring adapted to draw arm, 22, and, consequently, the rollers, 29, toward the said rollers carried by the transfer-box, at an interval in the rotation of said cam, all constructed and adapted to operate substantially as and for the purpose set forth.

In testimony whereof I have hereunto affixed my signature in the presence of two subscribing witnesses.

JAMES GILL.

Witnesses:

CHARLES J. LYNCH,
C. H. COCHRAN.