

C. Chambers Jr.
Mach. for Cutting & Folding Paper
Nº 30719. Patented Nov. 27/1860

Fig. 1.

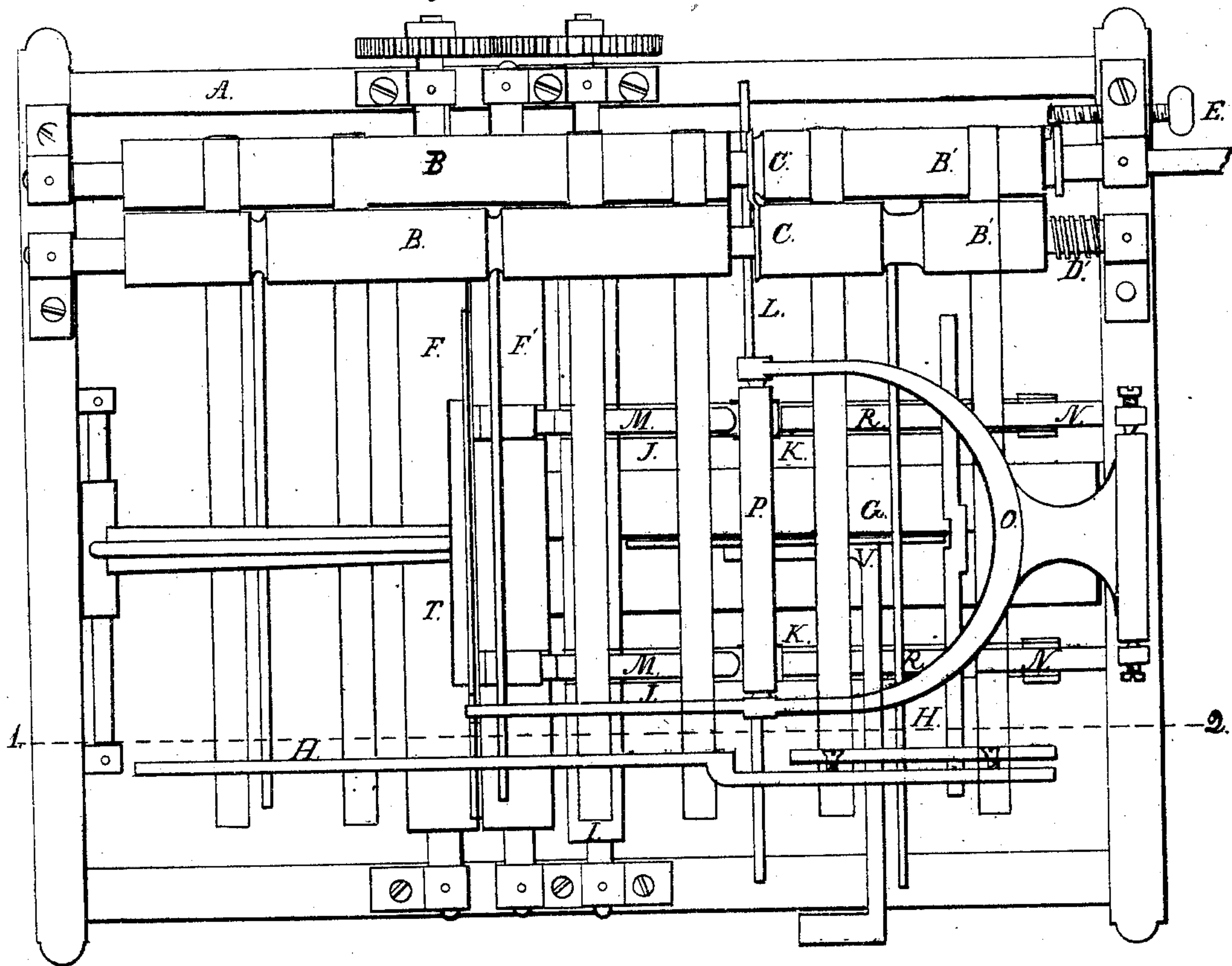


Fig. 2.

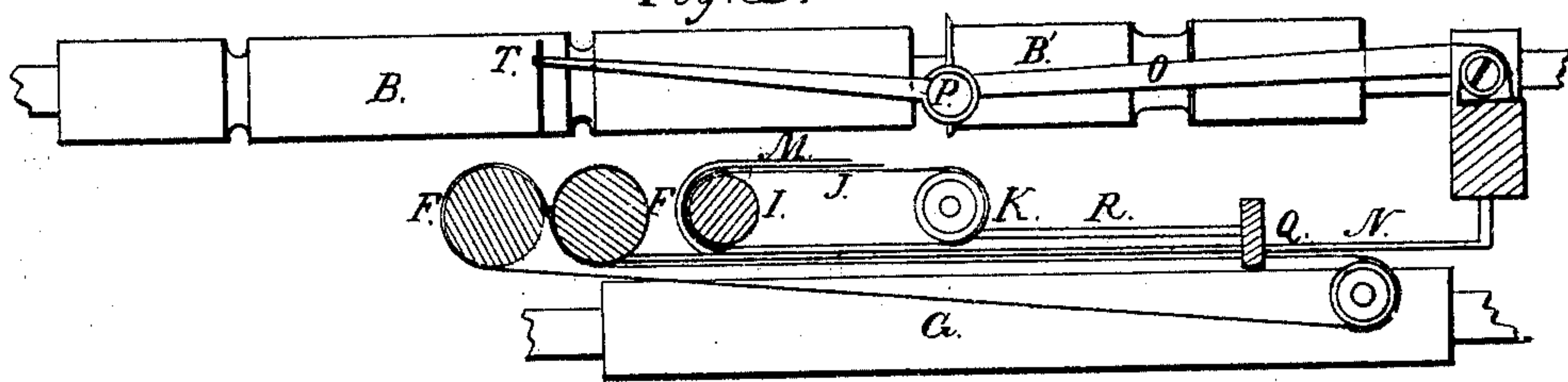


Fig. 3.

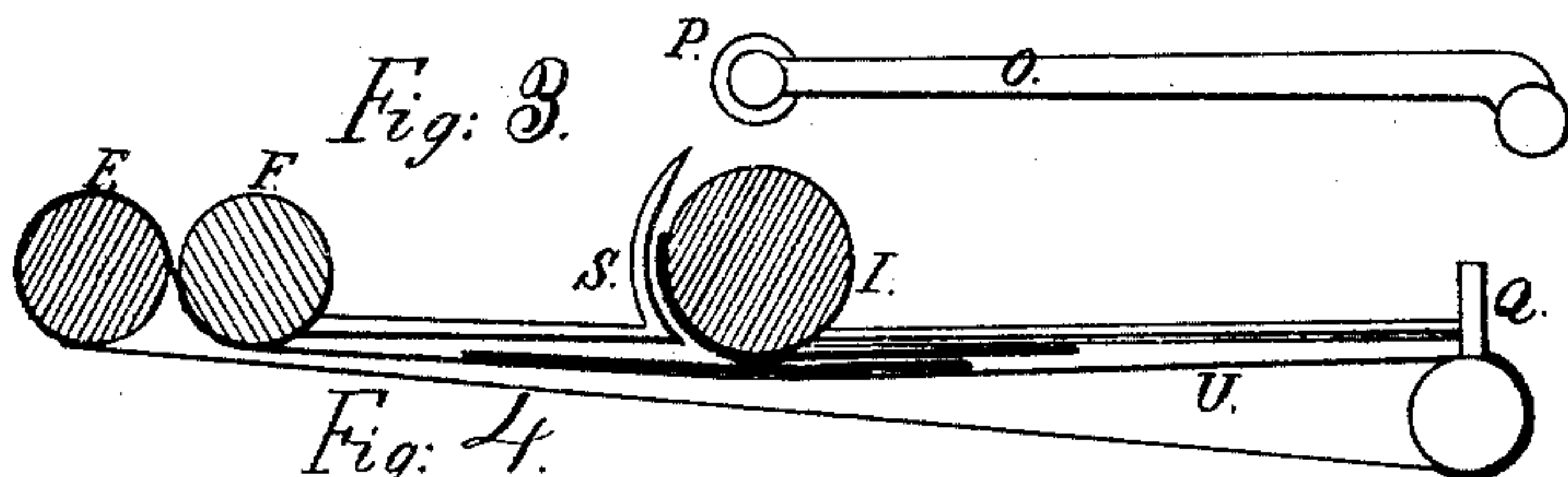
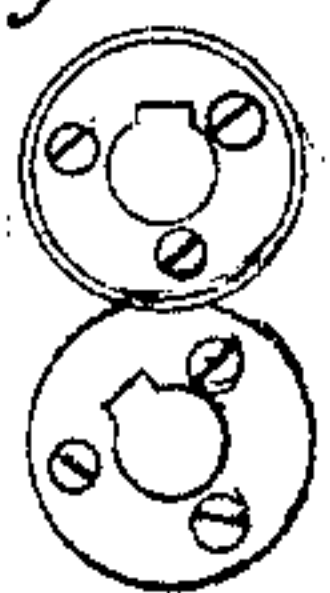


Fig. 4.



Witnesses.
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CYRUS CHAMBERS, JR., OF PHILADELPHIA, PENNSYLVANIA.

MACHINE FOR FOLDING PAPER.

Specification of Letters Patent No. 30,719, dated November 27, 1860.

To all whom it may concern:

Be it known that I, CYRUS CHAMBERS, Jr., of the city and county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Machinery for Cutting and Folding Paper; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a plan or top view of the improved machine; Fig. 2 is a vertical section of the same on the line 1—2 of Fig. 1; Fig. 3 shows a modification of the arrangement shown in Fig. 2, and Fig. 4 is a side view of the rotary cutters, showing the mode of their attachment to the rollers.

My invention consists in such a modification of the well known 8vo. book folding machine patented by me 5th April 1859, as shall adapt it to the folding of a double 12mo. sheet, or a sheet composed of 24 pages, so imposed that eight of the pages are cut off from the main sheet, folded, and placed within the remaining sixteen pages, as hereinafter more fully set forth; and its principal peculiarities are first, securing the revolving cutters which cut off the inset, to a portion of the first folding rollers so that they may be easily adjusted; second, a peculiar arrangement of the stop for the inset; third, carrying the inset to such a position relatively to the main sheet that it may be folded properly within it.

To enable others to make and use my invention, I will proceed to describe particularly its construction and operation making reference to the drawings forming part of this specification in which the same letter indicates the same part wherever it occurs.

A marks the cross rails of the main frame which are made about six inches longer than those of an ordinary 8vo. machine.

B B are the first folding rollers. On their shafts are placed two short adjustable rollers B' B', to which are attached, by feathers and grooves, as seen in Fig. 4, the rotating cutters C C, which revolve with the rollers. The cutters C are held in contact by a spiral spring D, on the shaft of one of the rollers, as shown, said spring pressing against the end of the roller on whose

shaft it is placed. Both rollers are adjusted to the desired position and retained there by means of the screw E, which has a flange upon its end working in a groove in the roller as clearly shown in Fig. 1. The second and third pairs of rollers, F F and G G, are arranged substantially in the manner described in the patent before alluded to.

The first stop is made in two parts H and H', so that the part H', against which that part of the sheet which is cut from the main sheet comes, can be adjusted independently of the main portion H of the stop, for reasons hereafter given. The part H' is made thus adjustable on the part H by means of screws, as shown in Fig. 1.

Two additional tapes are placed on the adjustable part B', of the folding rollers, for the purpose of conducting out, against the stop H', that part of the sheet which is cut off by the rotating cutters C.

Parallel to the second folding rollers F F is an additional roller I, which turns in suitable bearings, and receives motion from one of the rollers E, by any convenient gearing. Around this roller, pass two tapes J, which are carried to two tape pulleys K K having their bearings on a rod L, extending to the cross rails A. Around roller I, and projecting nearly to the tape rollers K, is a pair of bars M M so curved and arranged as to come nearly into contact with roller I and tapes J. These bars M are branches extending up from the main guide bars N which extend from the under surface of rollers F just above the level of the tapes leading therefrom, and have their main support in the frame of the machine, as shown in Figs. 1 and 2. The bars N support the adjustable stop Q from which project the short guiding bars R.

Secured in suitable bearings to the side frame, is a vibrating frame O, carrying a drop roller P. This frame receives its vibratory motion from the second folding knife T, by means of an arm extending over the back of that knife, as shown, so that when the knife rises and falls, the frame O and roller P rise and fall with it. The roller P receives rotary motion from the tapes J when it is down and in contact with them. Its vibratory motion may be ob-

tained, if preferred, by means of an independent cam in the mode commonly employed in printing presses.

Fig. 3 shows a modification of this arrangement, which consists in enlarging the roller I, and placing it in the position of the tape pulleys K K, so that the drop roller P may come into direct contact with it; and thereby dispensing with the pulleys K K, the tapes J J, the bars N and branches M, substituting for the last the curved bars S, shaped and located as represented. The object of these changes will hereafter appear.

All parts necessary for the proper feeding, manipulation and delivery of the sheets, which are not described and shown in this application, will be found fully set forth and illustrated in the several patents heretofore granted to me, and do not require renewed description here.

Operation: The operation of the machine is as follows: The 12mo. sheet is fed to the machine in the proper position for the first knife to make the first fold in the main sheet, as well as in the inset, or that part which is to be cut off by the revolving cutters C, and so that the second folding knife T, will make the second fold in the main sheet in the desired place.

The cutters C are adjusted by the screw E to the proper position for cutting off the inset, which will depend on the size of the sheet to be folded. The first folding knife, (not shown), on descending, forces the whole sheet between the rollers B B and B' B', which, by their rotation, carry the sheet in, and make the first fold, the cutters C cutting off the inset as it passes between the rollers. When the sheet has passed the rollers, the folded edge of the main sheet, or that part which contains sixteen pages, is arrested by coming in contact with the stop H; and the corresponding edge of the inset, or the part containing eight pages, is arrested by the independent stop H', being conducted by tapes from the rollers B'. The main sheet is now ready to receive its second fold.

In order properly to present the inset for correct folding by the last folding knife V, and to get it within the main sheet, it is necessary, according to the present method of imposing, that it should be turned upside down, and the cut edge brought even with the second folded edge of the main sheet. The imposition of the sheet might, if preferred, be changed, so that the pages of the inset would come in their proper order without turning, and this part of the mechanism would then be unnecessary.

On the descent of the second folding knife T, the drop roller P comes in contact with the tape pulleys K K, and binds the cut

edge of the inset between its own surface and that of the tape on said pulleys, starting the inset under the points of the bars M, and carrying it around the roller I, Fig. 2. By the friction of the roller I, and the tapes J, it is moved forward on the bars N, until its cut edge is brought against the stop Q. At the same time, the main sheet has received its second fold, and been carried forward by the tapes until its folded edge strikes against the same stop Q. The inset is now in a proper position to receive its second fold, and the main sheet to receive its third, the former lying directly over the latter and separated from it only by the bars N. The third folding blade V now descends and forces both sheet and inset between the last pair of folding rollers G G, which complete the folding and discharge them to the packing apparatus, the inset being folded within the main sheet, and in the proper position.

If the modification represented by Fig. 3 be used, the drop roller P must be so timed as to start the inset so that its cut edge will be a little in advance of the second folded edge of the main sheet when they meet as clearly represented by the heavy black lines at U in that figure. When the cut edge of the inset strikes against the stop Q (Fig. 3) the friction of the tapes against the under surface of the main sheet carries it forward until its folded edge strikes the stop, thus bringing the folded edge and cut edge of the two even, when they are ready for the action of the third folding knife V which completes the folding as before described.

When it is desired to make the second fold in the inset a greater or less distance from the first, than the third fold is from the first in the main sheet, (which, owing to imperfect register in the printing, is sometimes the case), it may be accomplished by adjusting the stop H' to a different line from that of stop H by means of the small screws in H' shown in Fig. 1.

Having thus fully described my improvements I do not claim broadly the combination of cutters with folding rollers irrespective of my particular mode of attaching and adjusting them, nor do I claim in this application adjustable stops; but

What I claim and desire to secure by Letters Patent is—

1. In folding a sheet where an inset is to be cut off, placing the inset by automatic mechanism, on the outset, and in proper position to receive the last fold.

2. Combining in one machine the mechanism for cutting off the inset, placing it on the outset, or main sheet, in proper position, and folding it therewith.

3. The combination with folding rollers of rotating cutters, when both are adjustable in the manner and for the purposes described.

5 4. The supplemental stop H', against which the inset comes, when made adjustable with, as well as independently of the stop H, as and for the purpose specified.

The above specification signed and witnessed this nineteenth day of November, 10 1859.

CYRUS CHAMBERS, JR.

Witnesses:

DAVID BERTLER,

RICHARD THOMPSON.