

(No Model.)

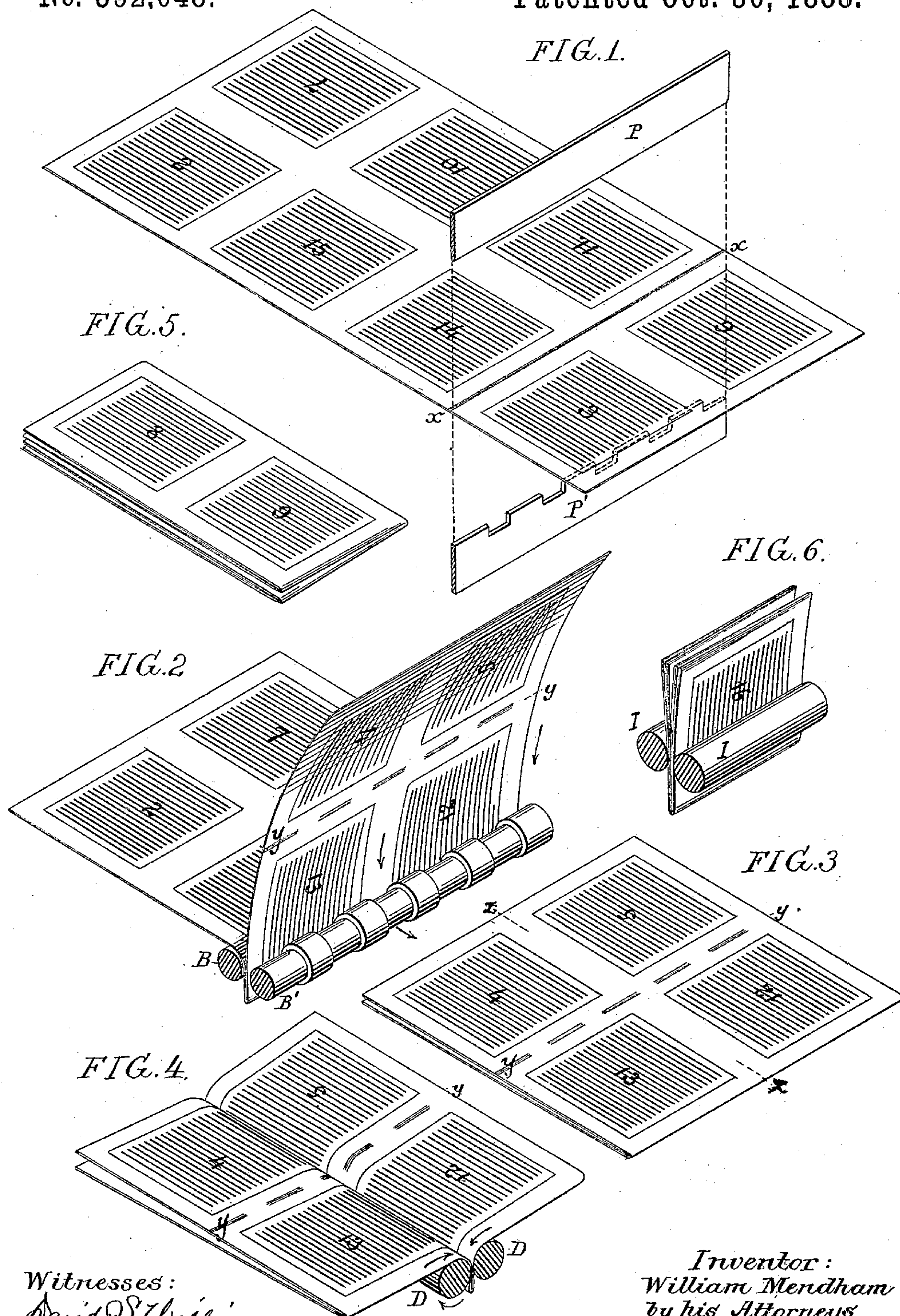
6 Sheets—Sheet 1.

W. MENDHAM.

PASTING AND FOLDING MACHINE.

No. 392,048.

Patented Oct. 30, 1888.



Witnesses:
David S. Williams,
Jno. E. Parker.

Inventor:
William Mendham
by his Attorneys

Horton & Horton

(No Model.)

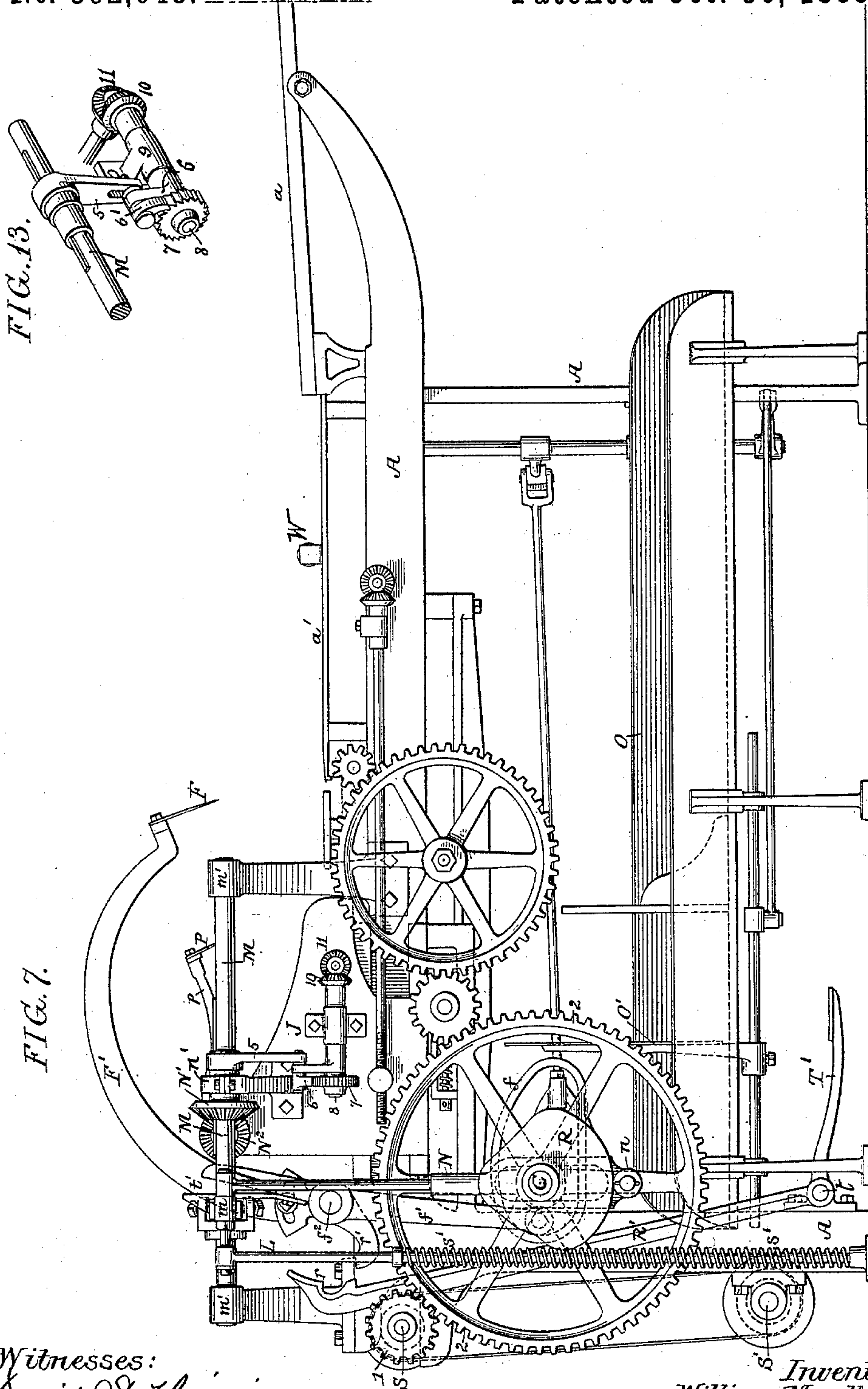
6 Sheets—Sheet 2.

W. MENDHAM.

PASTING AND FOLDING MACHINE.

No. 392,048.

Patented Oct. 30, 1888.



Witnesses:
David S. Williams,
Jno. E. Parker.

Inventor:
William Mendham,
by his Attorneys
Horton & Horton.

(No Model.)

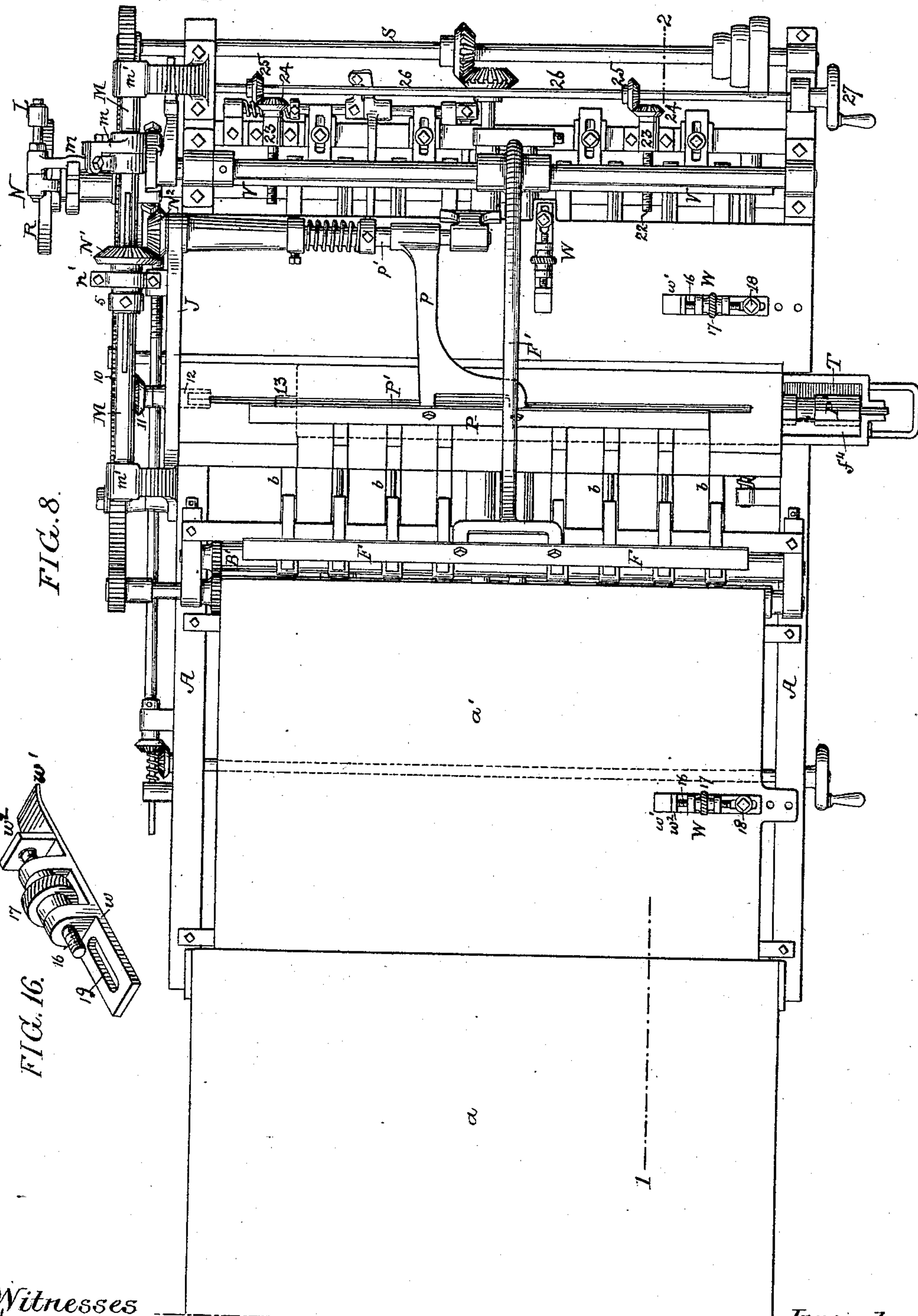
6 Sheets—Sheet 3.

W. MENDHAM.

PASTING AND FOLDING MACHINE.

No. 392,048.

Patented Oct. 30, 1888.



Witnesses
David S. Williams,
Jno E. Parker

Inventor,
William Mendham,
by his Attorneys
Howson & Howson.

(No Model.)

6 Sheets—Sheet 4.

W. MENDHAM.

PASTING AND FOLDING MACHINE.

No. 392,048.

Patented Oct. 30, 1888.

FIG. 9.

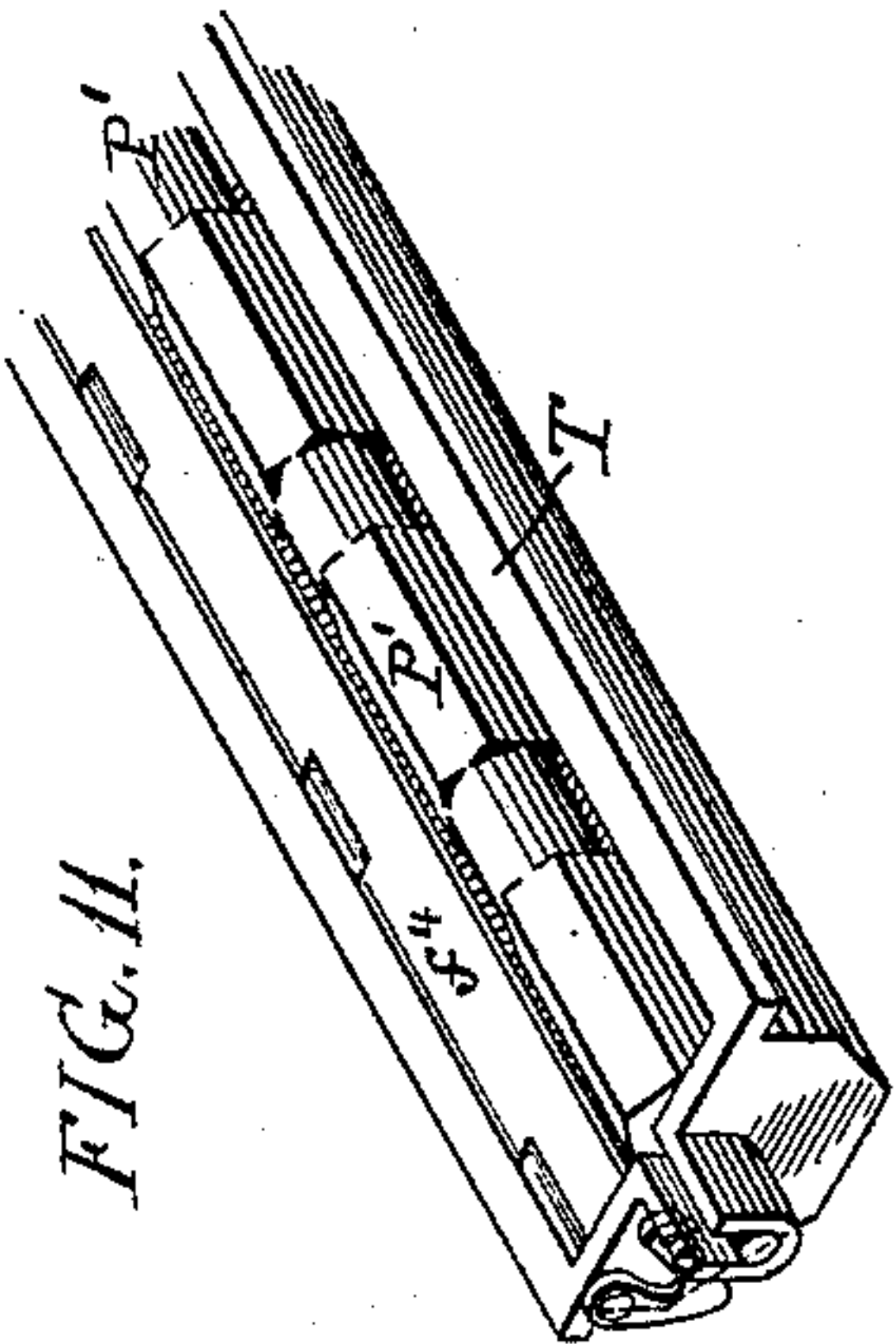


FIG. 11.

Witnesses:
David S. Williams,
Jno. E. Parker.

FIG. 14.

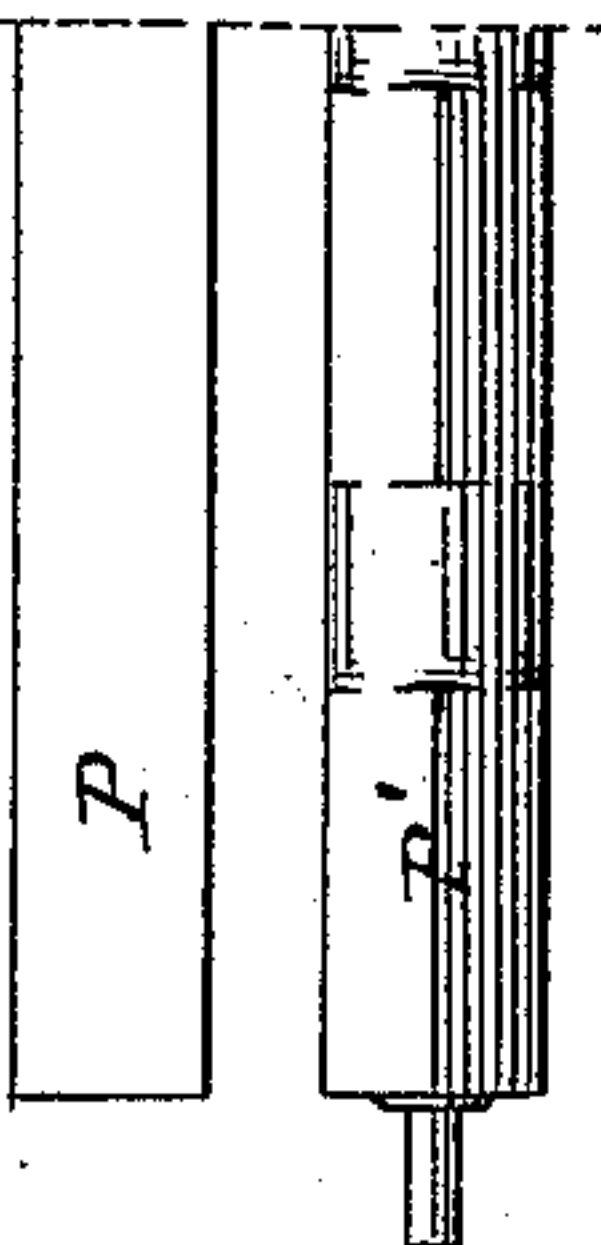
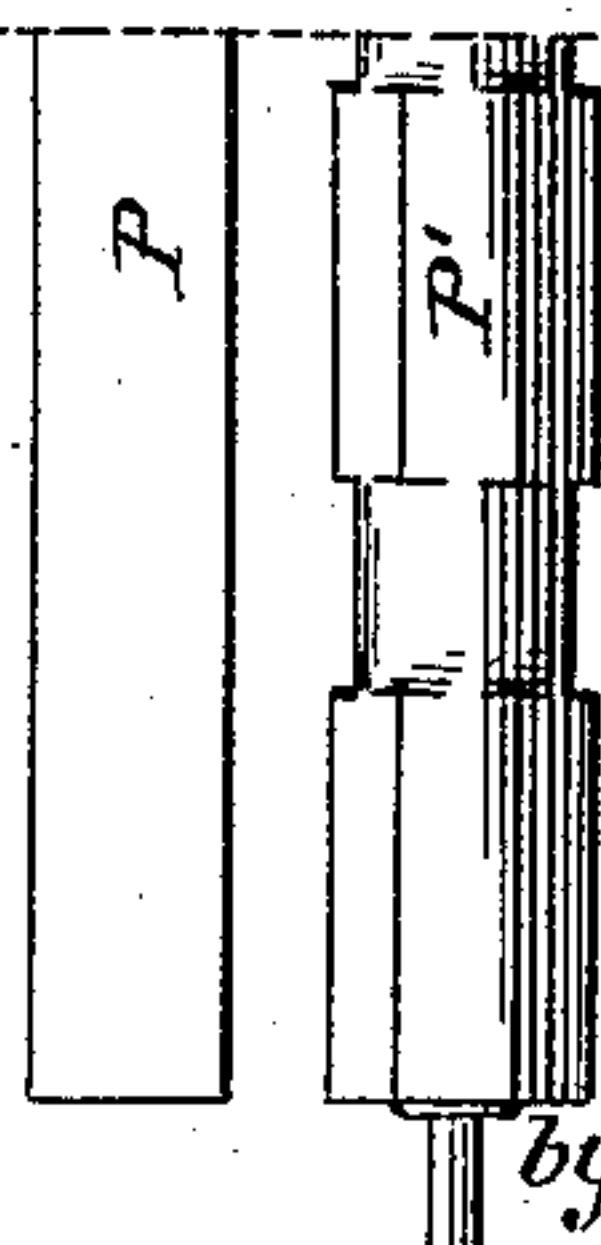


FIG. 15.



Inventor:
Wm Mendham,
by his Attorneys

Howson & Howson.

(No Model.)

6 Sheets—Sheet 5.

W. MENDHAM.

PASTING AND FOLDING MACHINE.

No. 392,048.

Patented Oct. 30, 1888.

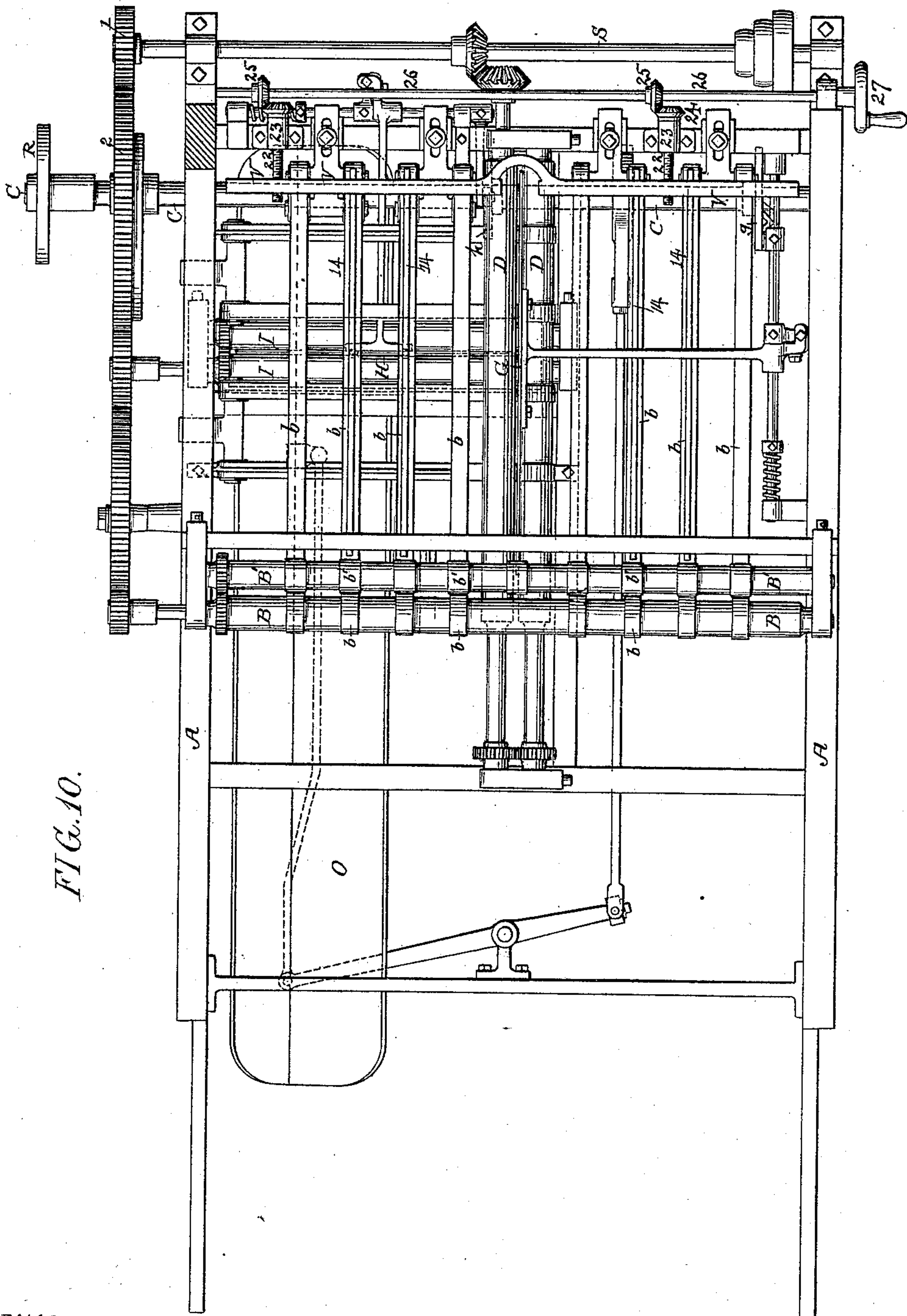


FIG. 10.

Witnesses:

David S. Williams,
Jno. E. Parker

Inventor:
William Mendham,
by his Attorneys

Houston & Houston.

(No Model.)

6 Sheets—Sheet 6.

W. MENDHAM.

PASTING AND FOLDING MACHINE.

No. 392,048.

Patented Oct. 30, 1888.

FIG. 17.

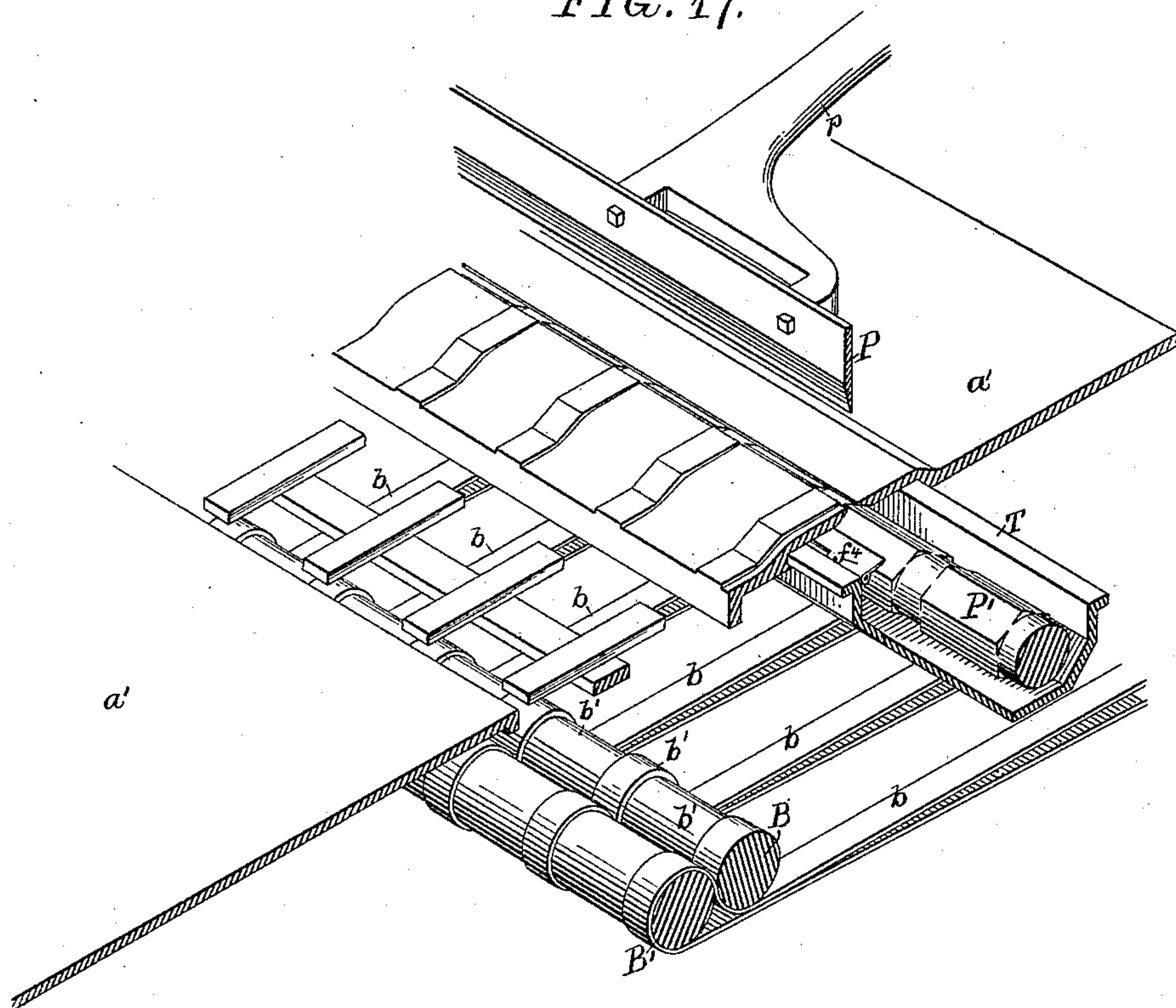
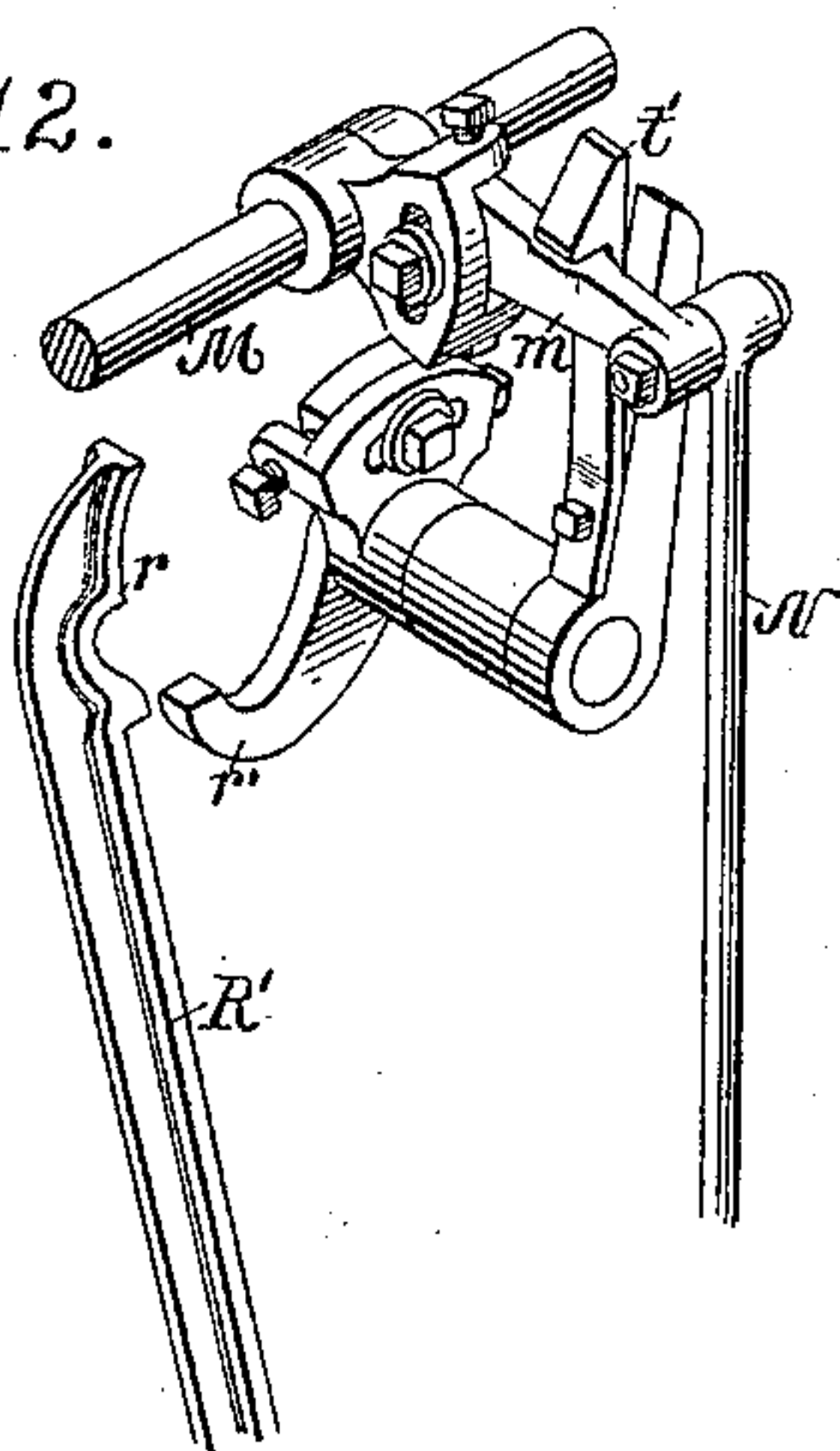


FIG. 12.



Witnesses:

E. J. Griswold.
John Revell.

Inventor:

William Mendham.

By his Attorneys.

Howe and Howson

UNITED STATES PATENT OFFICE.

WILLIAM MENDHAM, OF PHILADELPHIA, PENNSYLVANIA.

PASTING AND FOLDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 392,048, dated October 30, 1888.

Application filed November 19, 1887. Serial No. 255,591. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM MENDHAM, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in Pasting and Folding Machines, of which the following is a specification.

The main object of my invention is to simplify the pasting and folding of sheets of paper which are to be folded up into pamphlet or book form, and this object I attain as hereinafter described.

In the pasting and folding of paper by machinery, more especially newspaper and pamphlet work—into signatures of sixteen pages, for instance—it has been heretofore the practice to apply a first line of paste to one side of the sheet before the first fold is made, to then give the sheet the first fold, then apply a second paste-line across one-half of the folded sheet, and then give the latter the second and third folds successively. This involves two separate pasting operations and two sets of pasting devices at different parts of the machine. I greatly simplify this by pasting both sides of the sheet at one and the same time, as I will hereinafter describe.

In the accompanying drawings, Figures 1, 2, 3, 4, 5, and 6 are perspective diagrams illustrating my method of pasting and folding a sixteen-page pamphlet or signature. Fig. 7 is a side view of a pasting and folding machine provided with my improvements. Fig. 8 is a plan view of the same. Fig. 9 is a longitudinal section on the line 1 2, Fig. 8. Fig. 10 is a plan view with the bed-plate, pasting mechanism, and first folding-blade removed. Fig. 11 is a perspective view of part of the lower pasting-bar and paste-trough. Fig. 12 is a perspective view of the “tripping” or arresting devices for the upper pasting mechanism. Fig. 13 is a perspective view of a part of the mechanism. Figs. 14 and 15 are views of portions of the pasting blades or bars, the lower one being shown in its different positions in the two views; and Fig. 16 is a perspective view, drawn to an enlarged scale, of the adjustable guide for the sheet of paper. Fig. 17 is a perspective view of a part of the machine.

I will first describe my method of pasting and folding a sixteen-page pamphlet or signature without reference to the detailed machin-

ery which I have designed to carry out the method. To illustrate my explanation I will refer to Figs. 1 to 6, showing the successive manipulation in the pasting and folding of a sixteen-page sheet.

In Fig. 1, P and P' indicate two pasting blades or bars, by which lines of paste are to be applied to the sheet at the proper points. The lines of paste are applied to opposite sides of the sheet at the same time and before any folding takes place, the two pasting blades or bars being in advance of the first folding-rollers. The sheet of paper is first fed between the two pasting-bars P P', and the bars are then brought into contact with the opposite sides of the paper at the same time and paste thereby applied at the proper points—that is, a line, x , of paste midway between the third and fourth rows of pages on the upper side of the sheet and interrupted or broken paste-line y on the lower side of the sheet, directly opposite the line on the upper side. The pasted sheet then has its first fold imparted to it, Fig. 3, (by rollers B B', Fig. 2,) and the adjacent faces are caused to adhere along the paste-line x , which comes to the back of the signature when the latter has been folded. Then the sheet is folded again at right angles (by rollers D D, Fig. 4) to bring it to the form shown in Fig. 5. Another fold, Fig. 6, brings the sixteen pages in consecutive order. The interrupted or broken line of paste is so applied that when the sheet is folded, as indicated in Fig. 4, the broken lines of paste on one face will enter the spaces between the broken lines of paste on the opposite face, and the two broken lines of paste will then practically form one continuous line of paste.

To carry out the above-described method of pasting and folding, I employ the mechanism which I will now describe.

So far as the folding-machine proper is concerned, it may be constructed and operate on substantially the principle of the machine described and shown in Patent No. 15,842, dated October 7, 1856.

A is the frame of the machine, with feed-table a at one end for the supply of sheets to be folded, while underneath is the V-shaped trough O, into which the folded signatures are received, as is usual in this class of machines.

S is the driving-shaft of the machine, re-

ceiving its motion from the pulley-shaft S', which is provided with the usual fast and loose pulleys.

C is the cam-shaft, which receives motion from the driving-shaft through the medium of the pinion 1 on the latter gearing into the wheel 2 on the cam-shaft.

B B' are the usual first-fold rollers, between which the sheet is fed by the first folding-blade, F. The sheet is thence carried by the tapes b to a point (determined by the adjustable stop V, Fig. 10) over the second folding-rollers, D D, between which the sheet folded once is then inserted by the second folding-blade, G. The twice-folded sheet then in like manner passes to the third pair of folding-rollers, I I, between which it is inserted by the third folding-blade, H. The folded sheet then falls into the trough O, in which it is pressed by the reciprocating plunger O'.

It will be unnecessary to describe in detail the gearing by which the several folding-rollers, with their tapes, are driven, or the mechanism for imparting reciprocating motion to the plunger O' in the trough O, as these may be of any usual construction. With regard to the folding-blades F, G, and H, it will suffice to note that the first blade, F, is operated by the cam f acting on an arm, f', on the shaft f², which carries the arm F' of the blade, Figs. 7 and 9. The blade G, Fig. 10, is in like manner operated by the cam g, while the blade H, Fig. 10, is operated by a cam, h, Fig. 9. The forward motion of the first folding-blade, F, can be arrested or tripped by pressing on the treadle T' on the cross-shaft t, which carries the upright arm R', Fig. 7, having at its upper end a catch, r, to engage with a catch-arm, r', on the shaft f².

The above-described devices, constituting the principal elements of the folding mechanism, form no essential part of my present invention, as I may make use of different folding devices in connection with my pasting mechanism.

P is the upper transverse pasting blade or bar, and P' is the lower transverse pasting-bar, the former being carried by an arm, P, on the end of a short shaft, p', mounted in bearings on a bracket, J, on the frame of the machine. The intermittent vibrating movement of the arm of the upper pasting blade or bar, P, is obtained by means of a cam, R, on the cam-shaft acting on an anti-friction roller, n, on the lower end of a rod, N, Fig. 7. The upper end of this rod is connected to an arm, m, which is adjustably secured to a rock-shaft, M, mounted on fixed bearings m' on the frame, Figs. 7, 8, and 9. To this same arm m is connected a rod, L, acted on by a spring, s', which tends to press the rod upward and to keep the anti-friction roller at all times in contact with the cam R.

On the rock-shaft M is a bevel-gear, N', having a groove-and-feather connection with the shaft, Fig. 3, so as to turn therewith, but be free to be moved longitudinally thereon. This

gear is mounted in a bearing, n', on the bracket J, and meshes into a corresponding gear, N², on the end of the shaft p', which carries the pasting-blade arm, Fig. 8.

The lower pasting-bar, P', which is one of the characteristic features of my invention, is made with two different edges, one notched and the other straight or plain, (see the diagram, Fig. 1,) and it performs the double function of imparting a continuous line of paste to the lower edge of the upper blade and of imparting a broken or interrupted line of paste to the under side of the sheet of paper. The straight edge of the lower paste-bar is brought into position to transfer the paste to the edge of the upper bar or blade, while the notched edge is brought into play to transfer the interrupted line of paste to the paper. As a convenient way of making this compound lower paste-bar, I construct it in the form of a roller, P', which is made alternately cylindrical and polygonal, as shown in Fig. 11. The centers of the flat sides of the polygons are flush with the cylindrical parts, while the angles of the polygons project beyond the peripheries of the cylinders. Thus if a straight edge (the upper paste-blade, P, for instance) be laid along the roller on a line running through the centers of the corresponding flat sides of the polygons, as in Fig. 14, it will be in contact with the roller throughout its length, while if the blade be laid on the roller on a line running through corresponding apexes of the polygons, as in Fig. 15, the contact will be discontinuous or interrupted where the cylinders occur.

In the drawings I have shown the polygons as in the form of hexagons; but their shape is not material, provided they are regular polygons and all correspond in shape and position.

The roller made as described is mounted in bearings in the paste-trough T, which is bodily removable, being mounted in guides f in the bed a' of the frame, Fig. 9. In Fig. 8 I have shown the trough with its roller and doctor f⁴ as partly drawn out, and in Fig. 11 it is shown detached from the machine.

Devices are provided for imparting an intermittent rotary motion to this bar or roller P', to bring the straight and the notched edges into position alternately to act in conjunction with the upper pasting-blade, P. In the present instance I have shown the roller as receiving its motion from the same rock-shaft, M, as imparts motion to the upper pasting-blade. To the hollow spindle of the bevel-gear N' is secured an arm, 5, acting on a pawl-carrier, 6, which has a pawl, 6', engaging with a ratchet-wheel, 7, Fig. 13, on a spindle, 8. This spindle turns in a bearing, 9, on the bracket J, and carries at its opposite end a bevel-pinion, 10, gearing with a bevel-pinion, 11, in bearings in the bracket J. As indicated by dotted lines in Fig. 8, the stem 12 of this bevel-pinion 11 has a squared open end for the reception of the squared end 13 of the journal of the bar P' when the paste-trough is slid into place in its guides. The rock-shaft M, through

the medium of the pawl-and-ratchet mechanism, thus imparts at each movement a partial rotary movement to the paste bar or roller P' , to bring the straight and notched edges alternately into position to be struck by the edge of the upper pasting-blade.

The operation of the described devices is as follows: Before the sheet of paper is fed into position the pasting bar or roller P' is brought with the flat sides of its polygons uppermost, and while in that position the upper paste-blade, P , is brought down onto it, so as to receive on its lower edge a continuous line of the paste, which, under the control of the doctor f'' , gathers on the roller as it turns in its trough. The upper blade being then caused to rise a little, the sheet of paper is fed from the table a onto the bed a' of the machine into proper position for being acted on by the first folding-blade, F , which is to insert the paper between the first folding-rollers; but before this blade comes into action the pasting devices perform their effect. The lower pasting roller or bar, P' , has in the meanwhile been turned so as to bring a line of notched edges uppermost, and the upper paste-blade is caused to descend, so as to apply a continuous line of paste to the upper side of the sheet between the proper pages, while at the same time, by the pressure of this upper blade, the projecting edges of the lower pasting-bar apply an interrupted or broken line of paste to the under side of the sheet. The first folding-blade, F , then descends, and the sheet, pasted as described, passes through the folding-rollers to be folded in the usual way.

The primary object of applying only an interrupted line of paste to one side of the sheet is to prevent the paste from getting onto the folding-rollers $B B'$ or tapes b , and for this purpose the roller B' is formed with the collars b' at the points where the tapes b pass under it, and the notches in the pasting bar or roller P' are in line with these collars b' and the tapes, so that the unpasted portions of the sheet will pass under the tapes. The surface of the table or bed between the slot over the pasting-roller and the first folding-rollers is also correspondingly recessed, to allow the sheet to pass over without smearing the table with paste, Fig. 17.

On the under side of the pressure-bars 14, between the first folding-rollers and the stop V , I form recesses 15, as shown in Fig. 9, so that as the sheet is being drawn through the second folding-rollers, $D D$, the interrupted line of paste will not smear the bars.

The guides W on the bed of the machine are so adjusted that the sheet of paper when it reaches the second folding-rollers, $D D$, will be folded on a line, z , Fig. 3, crossing the interrupted line of paste between a dash of paste and a space, so that when folded the paste-lines on one face will enter the spaces between the paste-lines on the other face, as before described.

The construction of the adjustable guides W

will be more fully understood on reference to Fig. 16, from which it will be seen that they consist of a body, w , having a spring-tongue, w' , and adapted to be secured to the bed of the machine by means of a bolt, 18, passing through a slot, 19, in the body w . The face w^2 of the stop is made adjustable on the body by means of a threaded stem, 16, and an adjustable nut, 17, thereon. Approximate adjustment can be obtained by means of the bolt and slot, while the finer adjustment can be readily obtained after the machine has been started by means of the nut 17. The spring-tongue w' is bent downward at its outer end, so that when the guide is bolted down on the bed of the machine the straightening out of the tongue thereon will always keep the tongue perfectly flat and prevent catching of the sheet of paper on the guide.

In order to arrest or trip the pasting mechanism with the arrest or stoppage of the first folding-blade, I mount on the shaft f^2 a spring-catch, r^2 , Figs. 7 and 12, to engage with the arm m when the shaft f^2 is arrested by the arm R' .

In order to facilitate the correct adjustment of the stop V over the second folding-rollers, $D D$, I provide stems 22, adapted to bearings 23 on the frame of the machine. These stems at their inner ends are threaded and adapted to threaded openings in the stop-bar V , while at their outer ends they are provided with bevel-pinions 24, gearing with bevel-pinions 25 on a cross-shaft, 26, to be operated by a hand-wheel, 27, at the side of the machine, Fig. 8. By turning this hand-wheel the stop-bar V can be adjusted backward or forward evenly.

I claim as my invention—

1. The combination of the first folding-rollers of a folding and pasting machine with transverse pasting blades or bars for both sides of the sheet in advance of the said first folding-rollers.

2. The combination of the folding-rollers of a folding and pasting machine with transverse pasting blades or bars for opposite sides of the sheet, in line with each other, to paste both sides of the sheet at once.

3. The combination of the folding-rollers of a folding and pasting machine with a straight pasting blade or bar for one side of the sheet, and opposite to it a pasting blade or bar with both straight and notched edges for the other side of the sheet.

4. The combination of the first rollers and first-roller tapes of a pasting and folding machine with a pasting-blade having notched edges for the under side of the sheet, the notches being in line with the said tapes.

5. The combination of the first-roller tapes and first folding-rollers of a folding and pasting machine with a lower pasting blade or bar for the under side of the sheet notched opposite the tapes, one of the said first folding-rollers being provided with collars where the tapes pass around it.

6. The combination of the first folding roll-

ers and tapes of a folding and pasting machine, with the lower pasting blade or bar notched opposite the tapes, and the surface of the table correspondingly recessed between the said
5 blade or bar and the rollers, as and for the purpose set forth.

7. The combination of the first and second folding-rollers of a folding and pasting machine with an upper pasting blade or bar,
10 a lower pasting blade or bar, and guides on the bed-plate, whereby the lines of paste on one inner face of the second fold will enter the spaces between the lines of paste on the other inner face of the fold.

15 8. The combination of the upper pasting blade or bar of a folding and pasting machine with a lower movable pasting-blade having notched and straight edges, and a paste-trough containing the lower blade or bar.

20 9. The combination of the reciprocating pasting-blade of a folding and pasting machine with intermittently-rotating pasting-bar having straight and notched edges, and a paste-trough in which the said bar turns.

25 10. The combination of the reciprocating

pasting-blade and folding-rollers with the intermittently-rotated pasting-bar alternately polygonal and cylindrical throughout its length, and a paste-trough in which the said bar turns.

11. The combination of the folding-rollers
30 and first folding-blade of a folding and pasting machine, and a tripping or arresting arm for the blade, with the pasting blades or bars, operating-shaft therefor carrying an arm, and a
35 spring-catch controlled by the tripping-arm, all substantially as set forth.

12. The adjustable guide for a pasting and folding machine, consisting of a slotted frame adapted to be bolted to the machine, a spring-
40 tongue, and a guide-face having a screw-and-nut adjustment.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM MENDHAM.

Witnesses:

HUBERT HOWSON,
HARRY SMITH.