

No. 864,554.

PATENTED AUG. 27, 1907.

W. E. RAMAGE & H. D. SHAW.
PAPER MAKING MACHINERY.

APPLICATION FILED DEC. 6, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

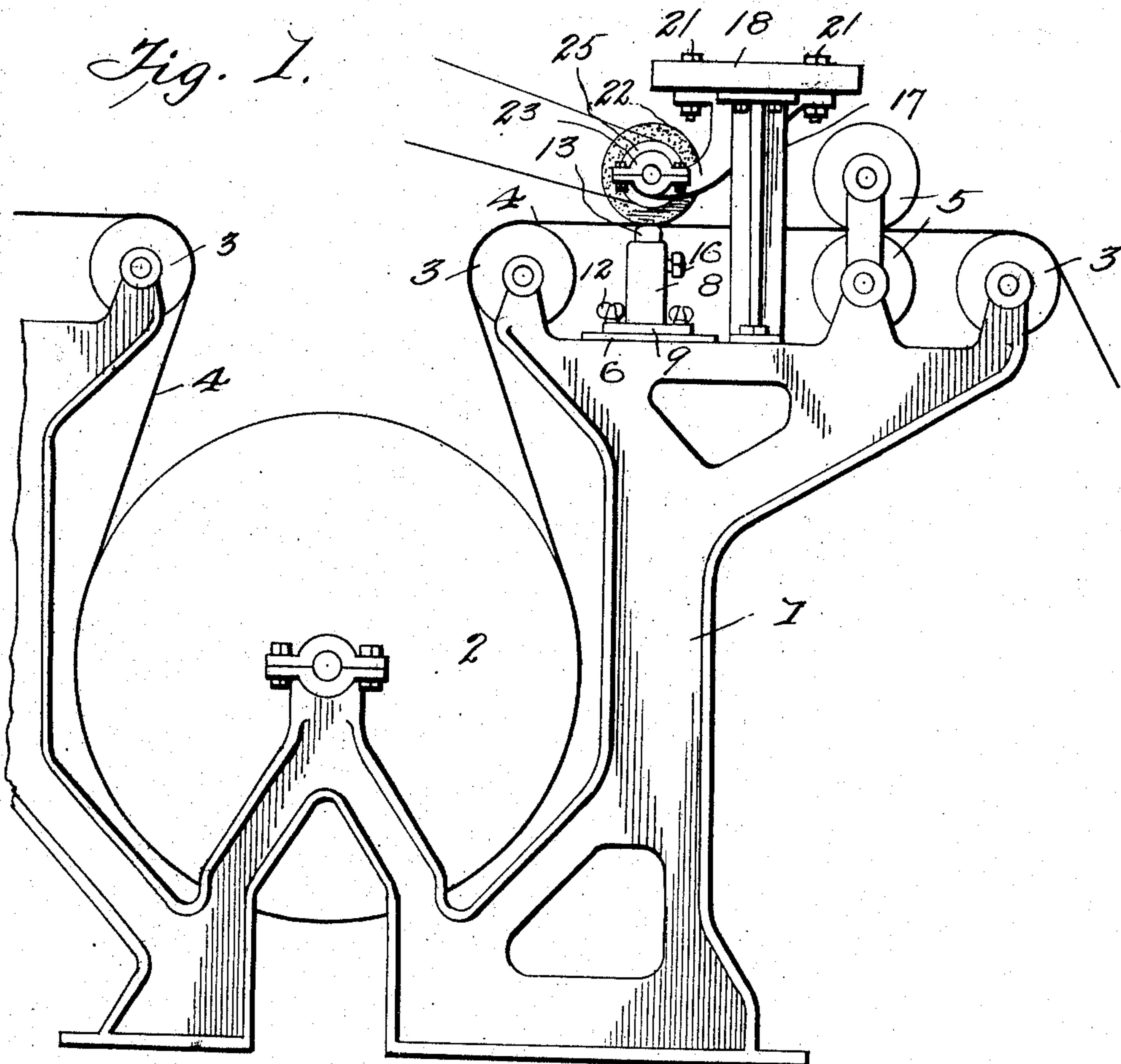
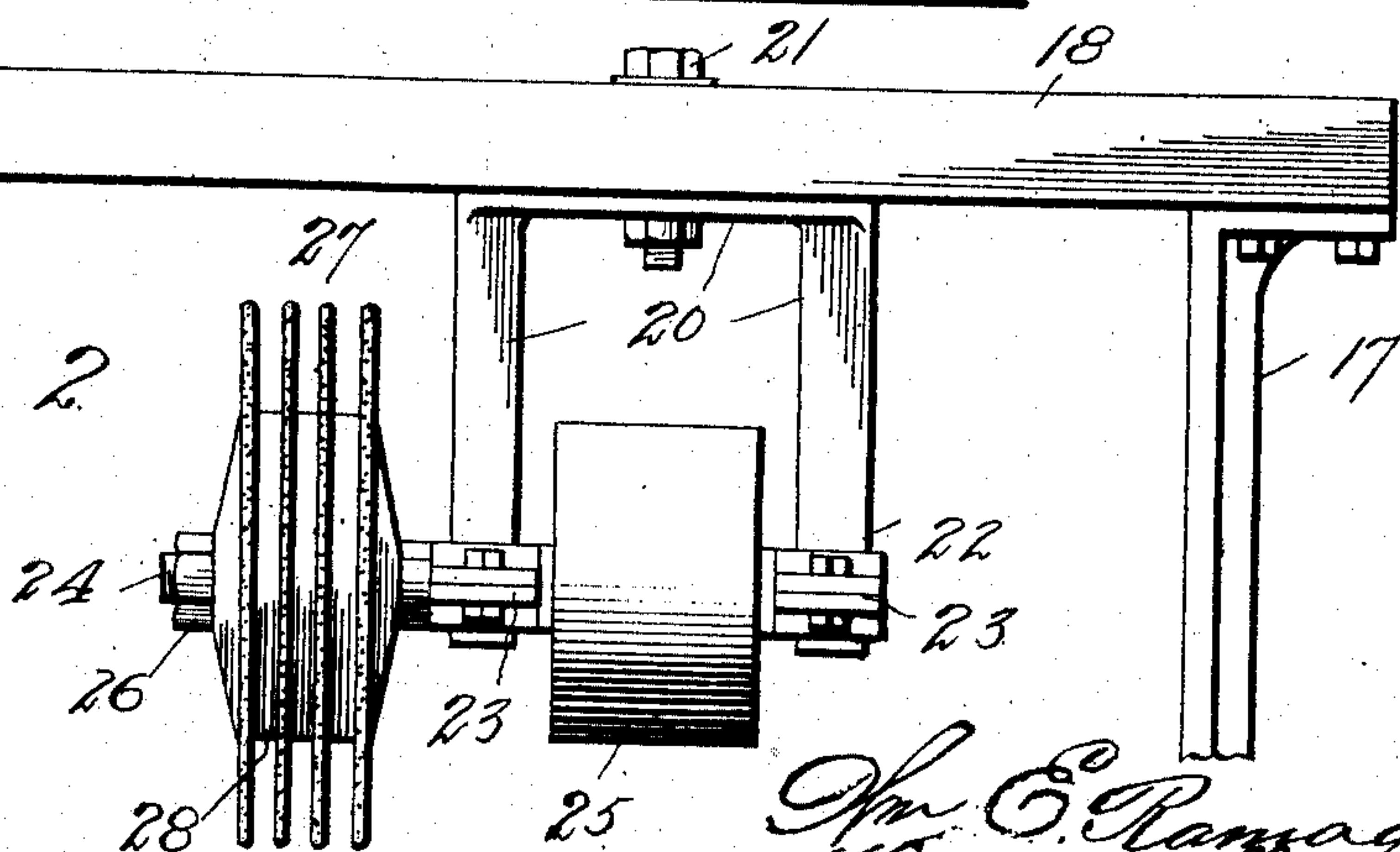


Fig. 2.



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12 SHEETS—SHEET 2.

Fig. 3.

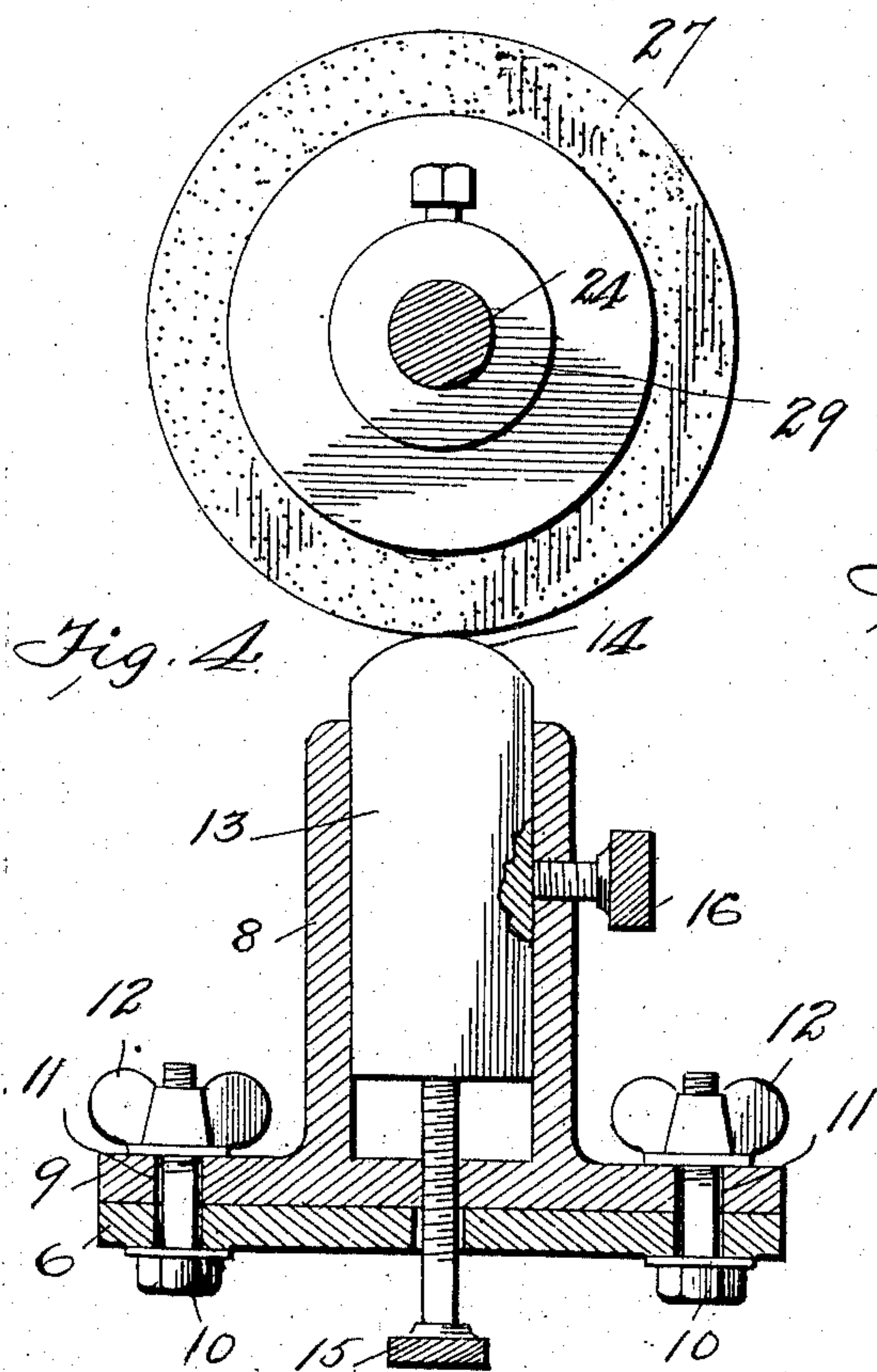
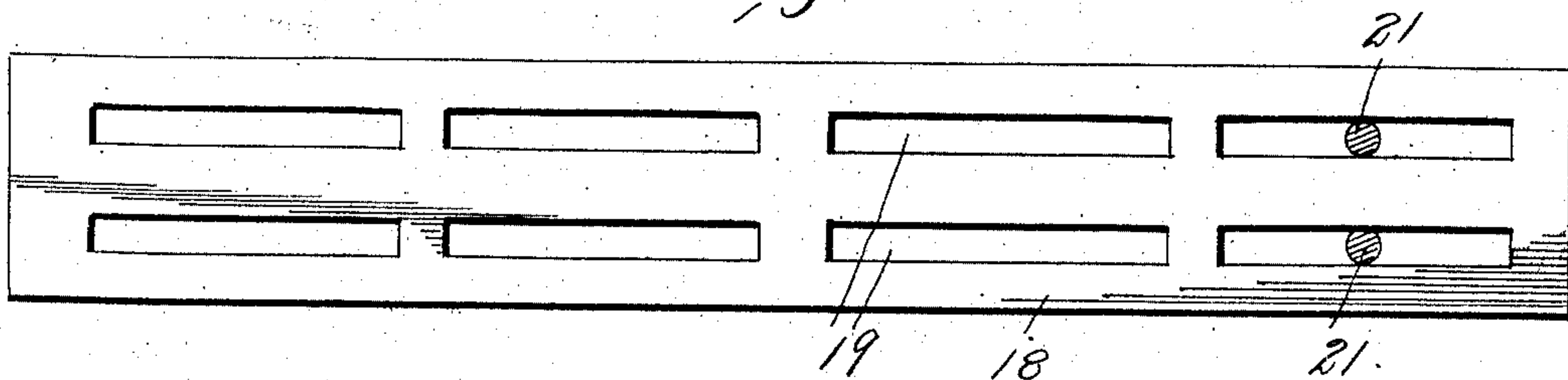


Fig. 6.

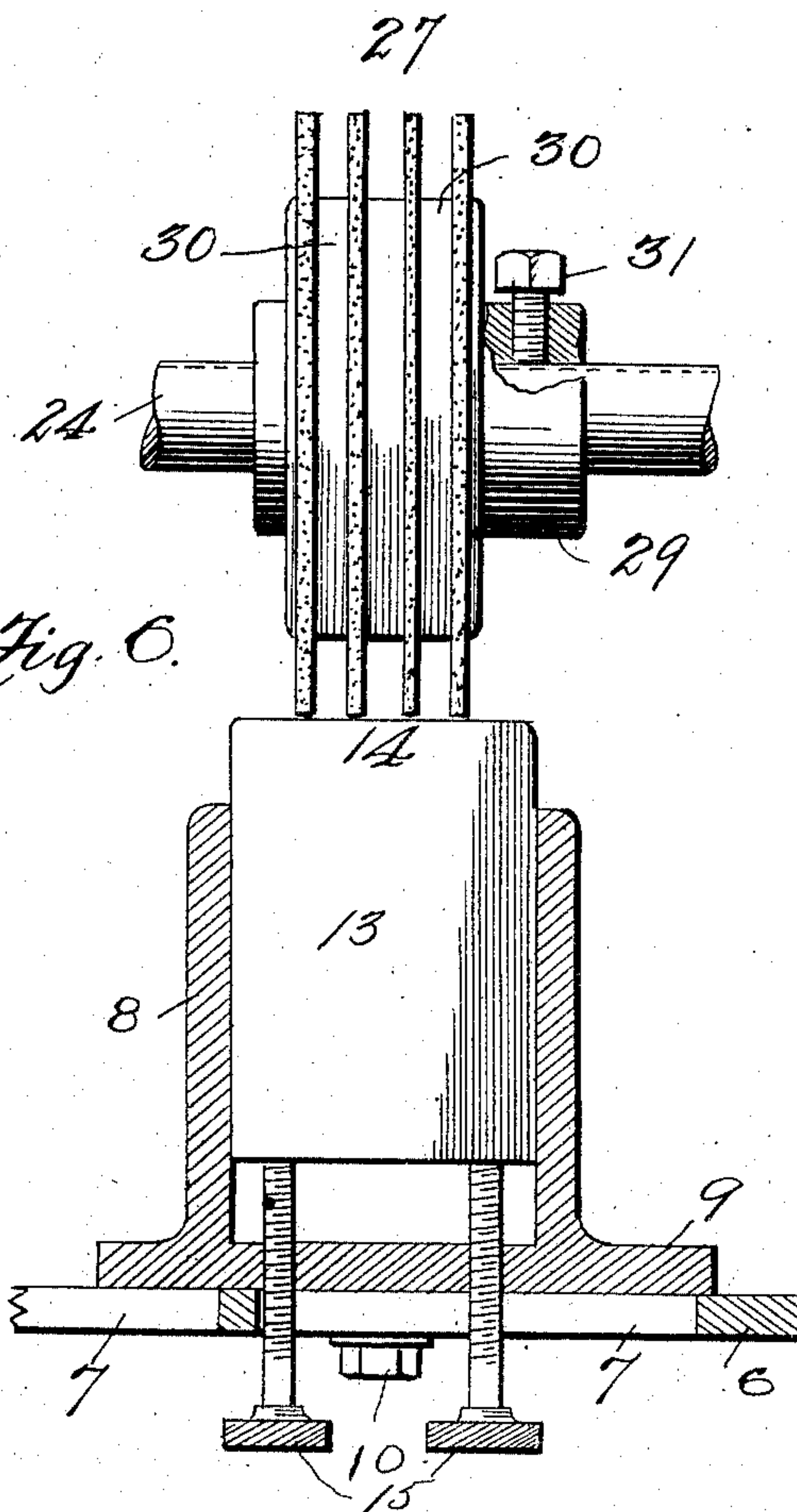
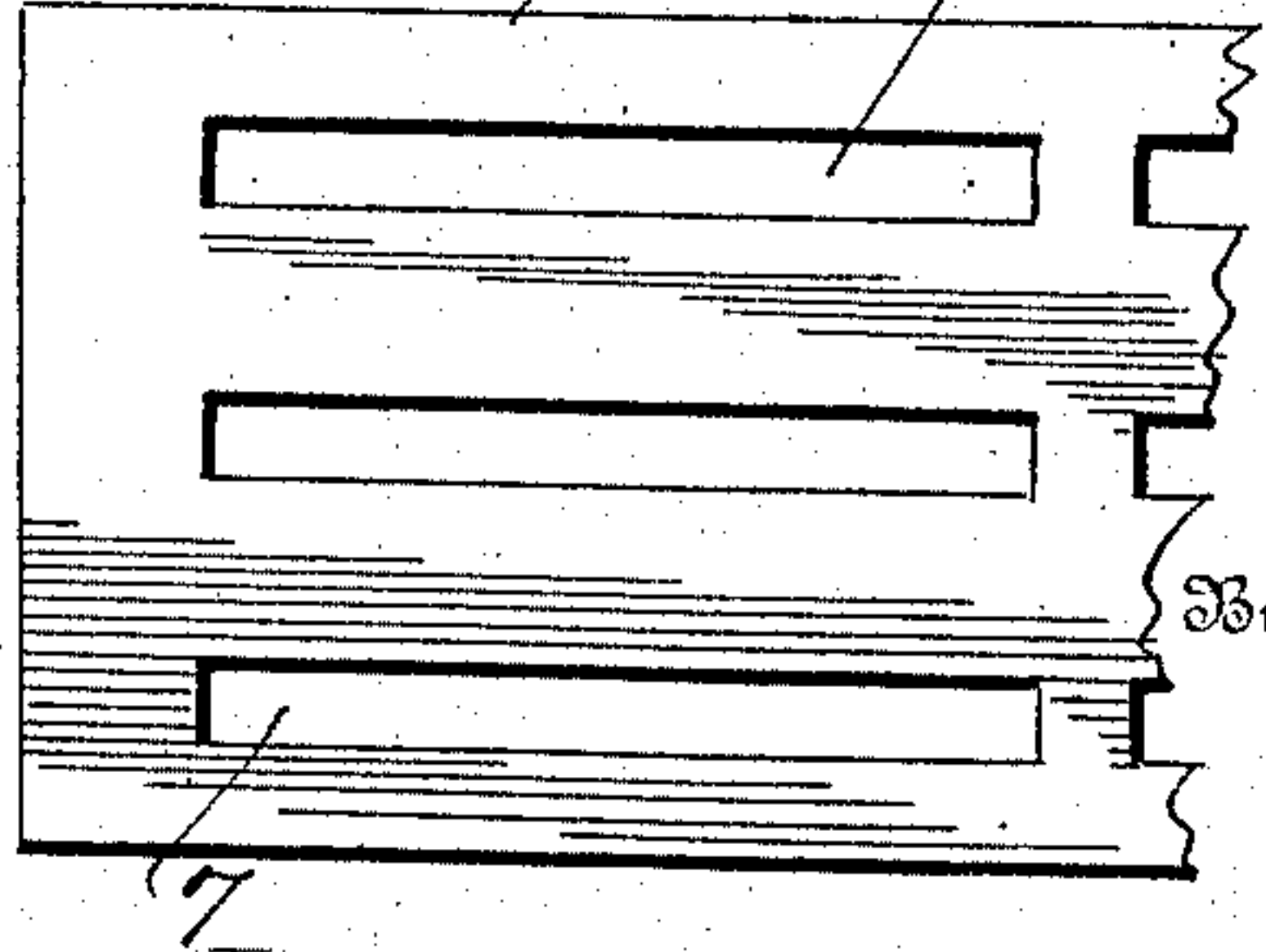


Fig. 5.

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UNITED STATES PATENT OFFICE.

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PAPER-MAKING MACHINERY.

No. 364,554.

Specification of Letters Patent.

Patented Aug. 27, 1907.

Application filed December 6, 1906. Serial No. 346,561.

To all whom it may concern:

Be it known that we, WILLIAM E. RAMAGE and HENRY D. SHAW, citizens of the United States, residing at Adams, in the county of Berkshire and State of Massachusetts, have invented certain new and useful Improvements in Paper-Making Machinery, of which the following is a specification.

Our invention relates to improvements in paper making machinery, and particularly to an attachment for that type known as the "Fourdrinier" machine, which is well-known in the art of paper making.

The object of our invention, is the provision of an attachment whereby as the web of paper leaves the drying rolls on the Fourdrinier machine, a groove or series of grooves is cut in the paper to render the same more flexible in certain portions, the paper then passing on through the attachment to the sizing boxes, then calendered and finished in the proper manner.

A further object of the invention is to produce a paper which by means of the aforesaid grooves possesses great flexibility along a certain portion thereof which portion may be used as the binding edge or hinge portion of the leaf when bound in book form, and to form the grooves before the sizing and calendering operations, so that the grooved or cut-away portions of the paper will be quite flexible but at the same time will possess practically the same strength and durability as the heavier portions of the sheet.

Another object of our invention is to provide simple and efficient mechanism for forming the grooves in the web of paper, and to render the said mechanism adjustable for use with paper of different widths and thickness, to cut grooves of any required depth, and to form any number of grooves or series of grooves, and to space the grooves in the desired relation.

To attain the desired objects, our invention comprises an adjustable platen or support over which the web of paper is adapted to pass, and a cutter wheel or series of cutter wheels arranged directly above the platen, the paper passing between the platen and the cutter wheels, and the various parts being adjustable to suit different conditions.

Our invention further comprises certain other novel features of construction, combination and arrangement of parts substantially as herein set forth, attention being invited to the accompanying drawings, in which:

Figure 1, is a broken side elevation of the end of a Fourdrinier machine known as the "dry" end of the machine, with my improvements applied thereto. Fig. 2, is a similar view of a portion of my invention, being the cutter wheels and support therefor. Fig. 3, is a plan view of the supporting plate or bar for the cutter-wheel bracket. Fig. 4, is a sectional view with parts shown in elevation to illustrate the arrangement

of the cutter wheels and paper support or platen. Fig. 5, is a plan view of a portion of the base plate for the platen support. Fig. 6, is a side elevation, partly in section, of the parts shown in Fig. 4.

We have designed our improvements so that they may readily be applied to the well-known Fourdrinier type of paper-making machinery and to such end we have shown a portion of such a machine in the accompanying drawings, in which:

The numeral 1, designates the "drier" frame, and 2, the last drier roll mounted therein. Rolls 3, are journaled in the frame, over which the web of paper, 4, passes, and "slitters" or rotary knives 5, are arranged near the end of the frame for cutting the web of paper into strips, all of the said parts being in common use.

Secured in the upper portion of the frame at a point in rear of the last drying roll, is a transverse plate or bar 6, provided with a series of longitudinal, parallel slots 7, therein, the slots being arranged in three courses, as clearly shown in Fig. 5, and this plate forms the base upon which the paper-support is arranged. A rectangular boxing or casing 8, having a flanged base 9, is mounted upon the base plate 6, and is adjustably secured thereon by means of the headed bolts 10, the bolts passing up through the outer series of slots in the base plate, through openings 11, provided in the flanged base, and wing nuts or clamping nuts 12, are secured upon the upper ends of the bolts. A supporting block or platen 13, having a rounded upper bearing edge 14, is inclosed in the boxing and is adjustable therein by means of the set screws 15, which engage the base of the platen and extend below the base plate 6, passing through the center slot therein. A thumb nut 16, engaged in the side of the boxing serves to lock the platen in its adjusted position.

Supported above the web of paper upon the standards 17, is a transverse supporting bar or plate 18, which is formed with a double row of parallel longitudinal slots 19, therein. A bracket 20, is secured to the under face of the supporting bar by means of the bolts 21, which pass through the slots in said bar, so that the bracket may be adjusted longitudinally upon the bar. Downwardly-inclined arms 22, depend from said bracket and are formed at their lower ends with the journal bearings 23, which support the shaft 24. A driving pulley 25, is fixed upon said shaft, preferably between the journal brackets, and also secured upon said shaft by means of a lock nut 26, (see Fig. 2) is a series of cutter wheels 27, which are spaced by means of the spacing collars 28. These cutter wheels are preferably of emery or hard steel, and are arranged directly above the platen so that the paper as it passes over the platen is contacted by the cutters which cut a series of parallel grooves in the web. By rotating the

cutters in the direction opposite to the travel of the web of paper and at a high rate of speed, the unfinished surface of the paper is removed to the depth desired. As shown in Figs. 4 and 6, the cutters may be arranged

5 upon a hub 29, and spaced thereon by collars 30, the hub being secured upon the shaft by the set screw 31.

The web of paper after it passes over the last drying roll, passes up over the guiding roll 3, and thence, preferably in a straight line, to the rotary knives and last
10 guiding roll. The platen and cutter wheels are arranged between the last drying roll and rotary knives preferably as shown in Fig. 1, so that the paper is grooved directly after leaving the drying roll and before it has been cut into strips. The paper after being
15 grooved and cut into strips may be sized and finished in the ordinary manner.

From the foregoing description taken in connection with the drawings, it will be evident that we have produced a machine which accomplishes all the objects
20 herein set forth, and which is especially useful for forming flexible hinge portions in the paper used for leaves in ledgers and other such heavy books.

While we have stated that our invention is particularly adapted for attachment to a Fourdrinier machine,
25 and have shown and described the device as in connection with such a machine, we would have it understood that our invention may be applied as well to any other type of paper-making machine.

I claim:

30 1. In paper making machinery, the combination with a base plate, a boxing adjustably secured thereon and a support adjustably arranged in said boxing, of cutters adjustably mounted above and adapted to operate in connection with the support.

35 2. Improvements in paper-making machinery comprising a base plate, an adjustable boxing having slotted connection with said base, a platen adjustably secured in the boxing, a support, a bracket adjustably secured to said support, and cutter wheels journaled in the bracket.

40 3. The combination with a paper-making machine having a transverse bar secured near the drier roll thereof, of a boxing adjustably secured on said bar, a platen adjustably secured in said boxing, a supporting bar arranged above

the transverse bar, brackets adjustably secured to said supporting bar, and cutter wheels journaled in said 45 bracket.

4. Paper grooving mechanism comprising a slotted base plate, a boxing mounted thereon and secured thereto by means of bolts passing through said slots, a platen adjustably secured in said boxing by means of set screws, a sup- 50 porting bar mounted upon standards above said boxing, a journal bracket adjustably secured to said supporting bar, and adjustable cutter wheels journaled in said bracket.

5. The combination with a base, of a boxing adjustably connected therewith, a platen arranged in said boxing, 55 means for raising the platen and securing it in adjusted position, journal brackets adjustably mounted above the platen, and adjustable cutters journaled in said brackets.

6. The combination with a supporting bar, of a journal bracket provided with a pair of depending arms and having 60 slotted connection with said bar, cutter wheels and driving means for the same journaled in said depending arms, and an adjustable support arranged adjacent the cutter wheels.

7. The combination with a paper making machine, of a transverse bar located adjacent the drier roll thereof, 65 a boxing adjustably secured to said bar, a platen having a rounded upper edge mounted in said boxing, means for adjusting the position of the platen, a transverse supporting bar located above the platen, a bracket adjustably secured thereto, and cutter wheels journaled in the bracket. 70

8. The combination with a paper making machine, of a transverse bar located near the drier roll thereof, an adjustable platen adjustably secured to the bar, a transverse bar located above the platen, a bracket adjustably secured thereto having depending arms, a shaft jour- 75 naled in said arms, driving means on said shaft, and adjustable cutters located on said shaft.

9. The combination with a paper making machine and a support located adjacent the drier roll thereof, of a boxing adjustably secured to said support, a platen 80 mounted in said boxing, means for adjusting the position of the platen in the boxing, a supporting bar located above the platen, a bracket adjustably secured to said bar having depending arms, a shaft journaled in said arms, driving means on the shaft, and a series of cutter wheels adjustably secured on the shaft.

In testimony whereof we affix our signatures in presence of two witnesses.

WILLIAM E. RAMAGE.
HENRY D. SHAW.

Witnesses:

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FRANKLIN H. B. MUNSON.