

No. 735,285.

PATENTED AUG. 4, 1903.

J. McCOY.

WALL PAPER PRINTING MACHINE.

APPLICATION FILED NOV. 6, 1902.

NO MODEL.

3 SHEETS—SHEET 1.

Fig. 1.

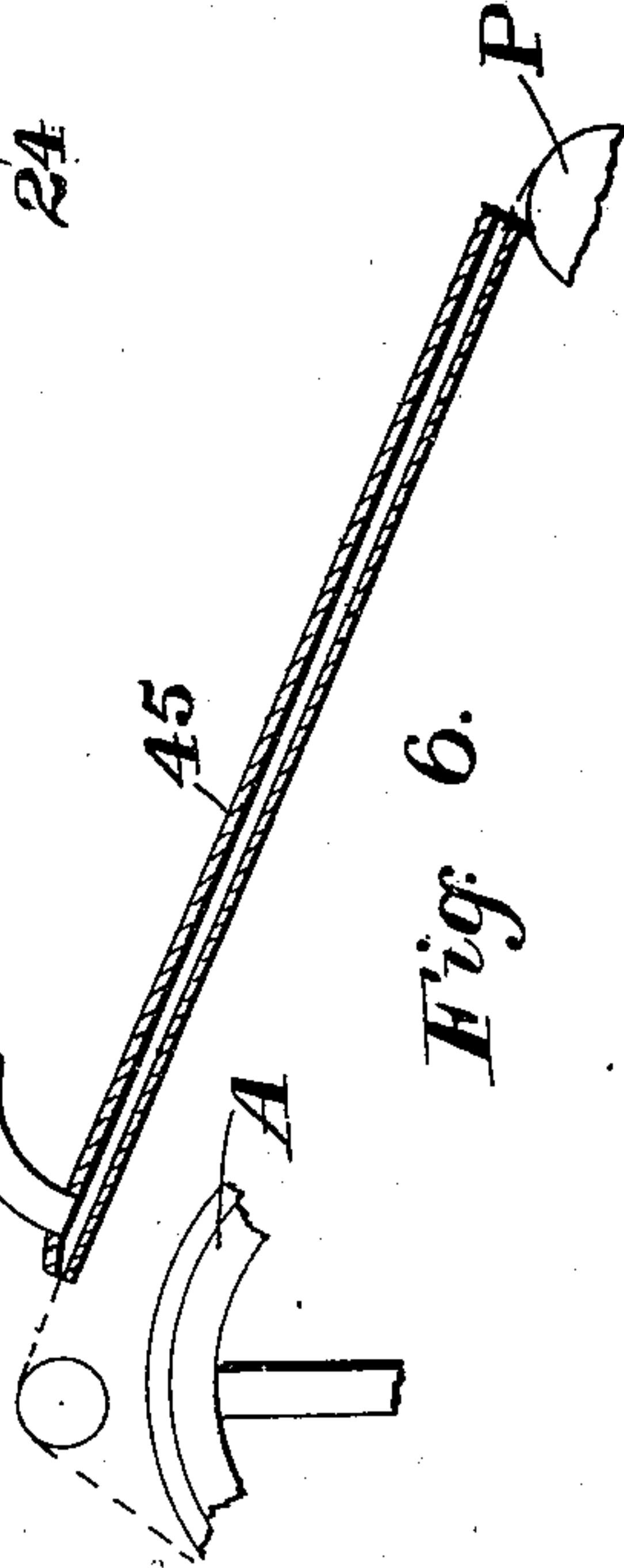
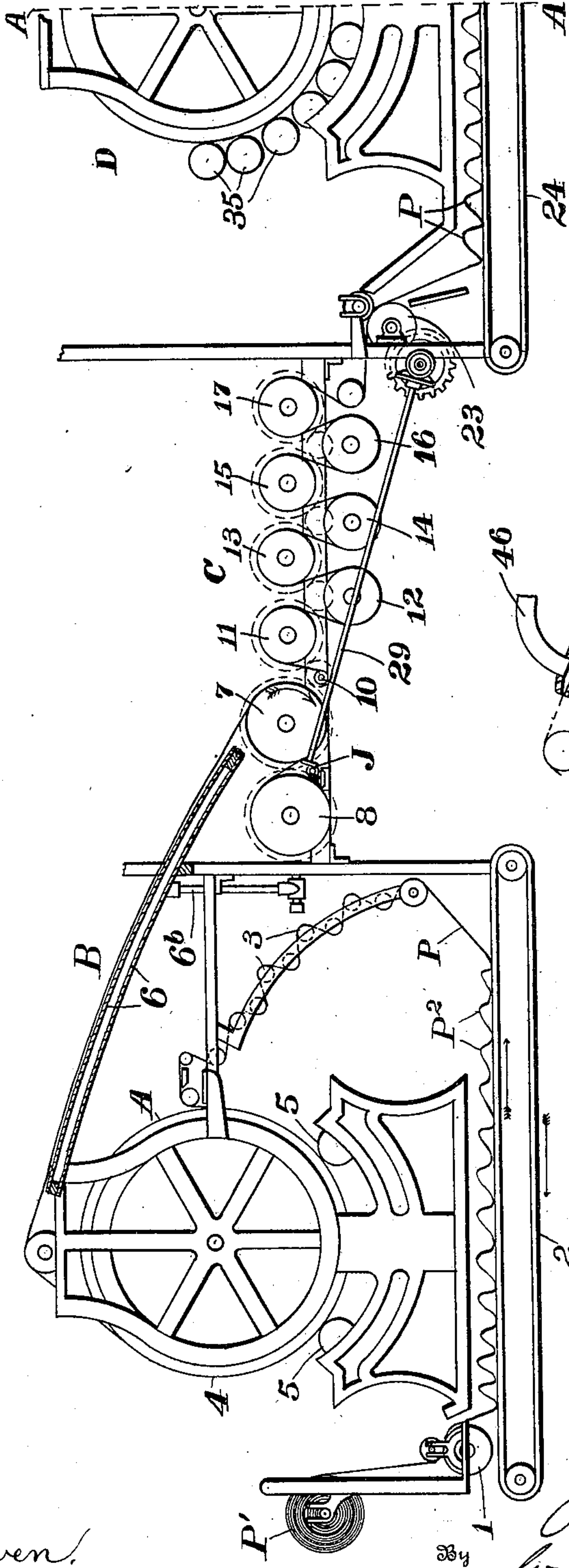


Fig. 6.

Witnesses

Percy C. Baven.
C. W. Clement.

Inventor

John McCoy
Watson & Watson

Attorneys

No. 735,285.

PATENTED AUG. 4, 1903.

J. McCOY.
WALL PAPER PRINTING MACHINE.
APPLICATION FILED NOV. 6, 1902.

NO MODEL.

3 SHEETS—SHEET 2.

Fig. 2.

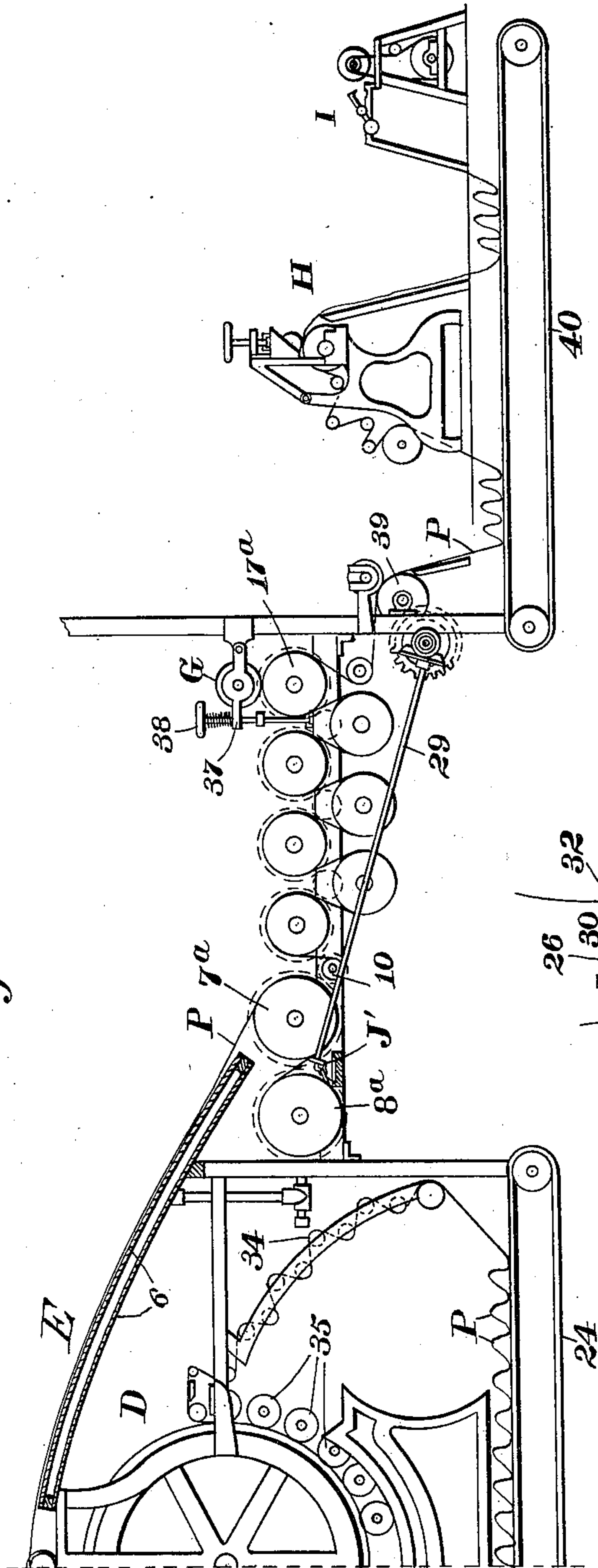
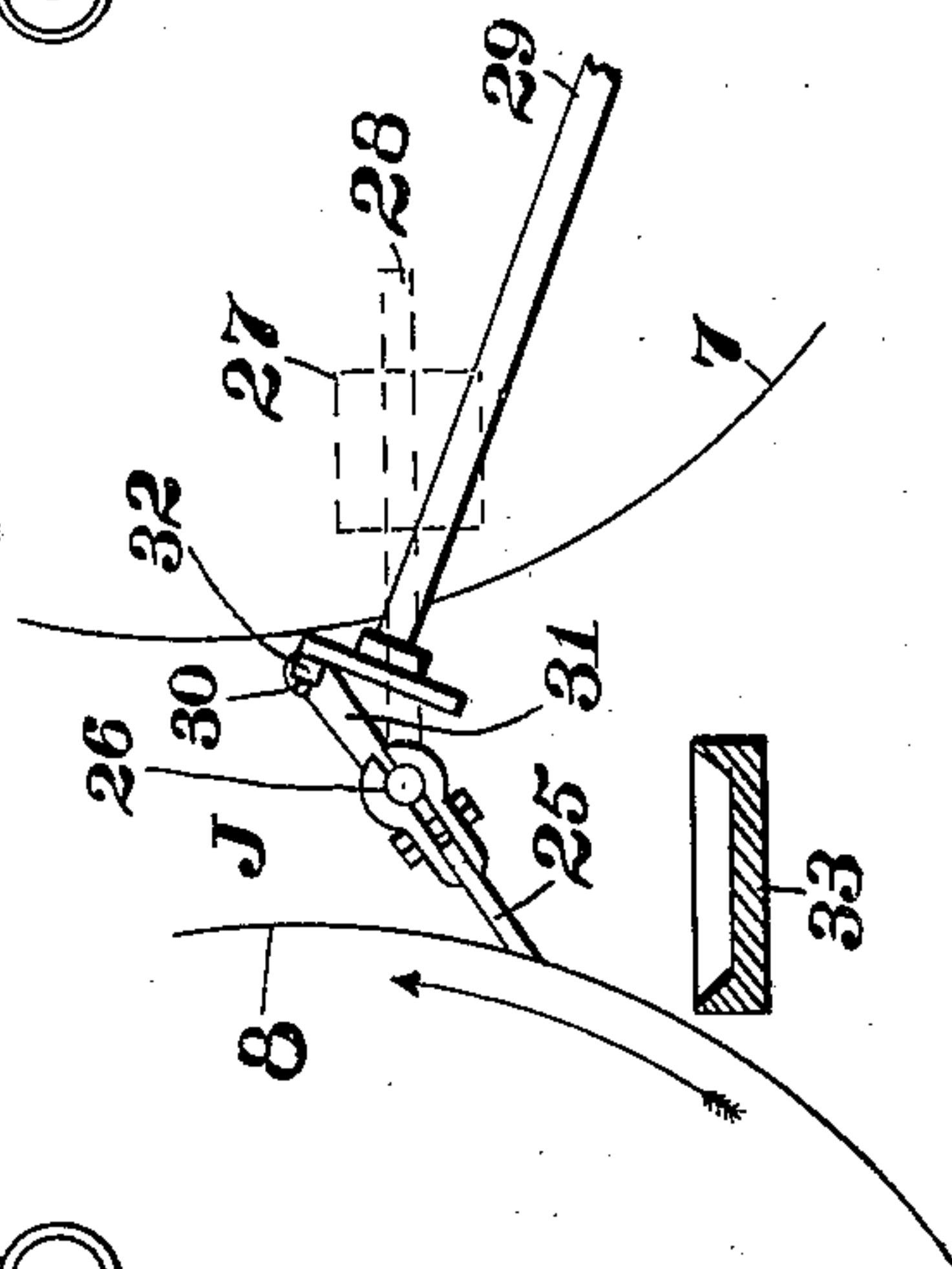


Fig. 5.



Witnesses

Percy C. Bowen
G. W. Clement

334

Inventor
John McCoy
Watson & Watson
Attorneys

No. 735,285.

PATENTED AUG. 4, 1903.

J. McCOY.
WALL PAPER PRINTING MACHINE.
APPLICATION FILED NOV. 6, 1902.

NO MODEL.

3 SHEETS—SHEET 3.

Fig. 3.

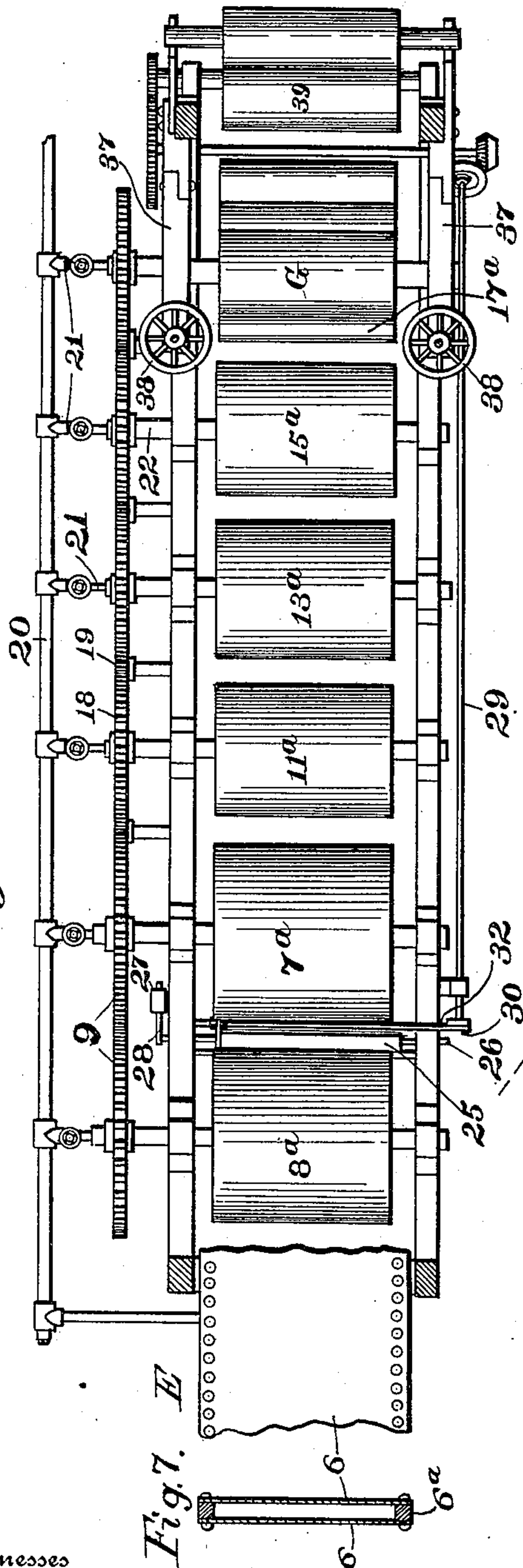
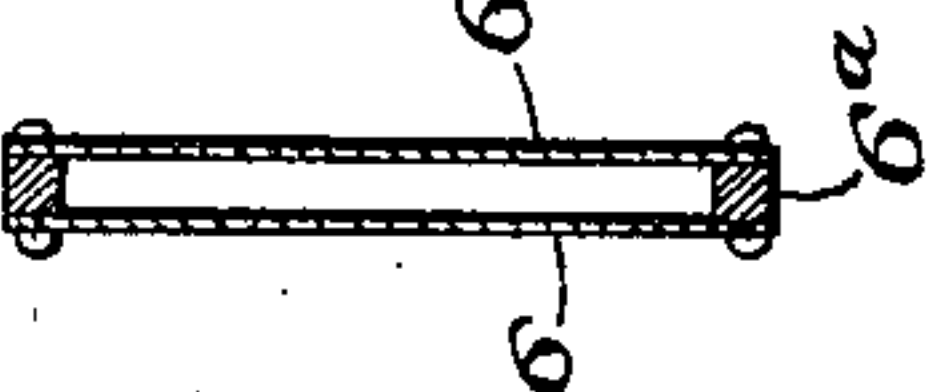


Fig. 7. E



Witnesses

Percy C. Bowen.
C. W. Clement.

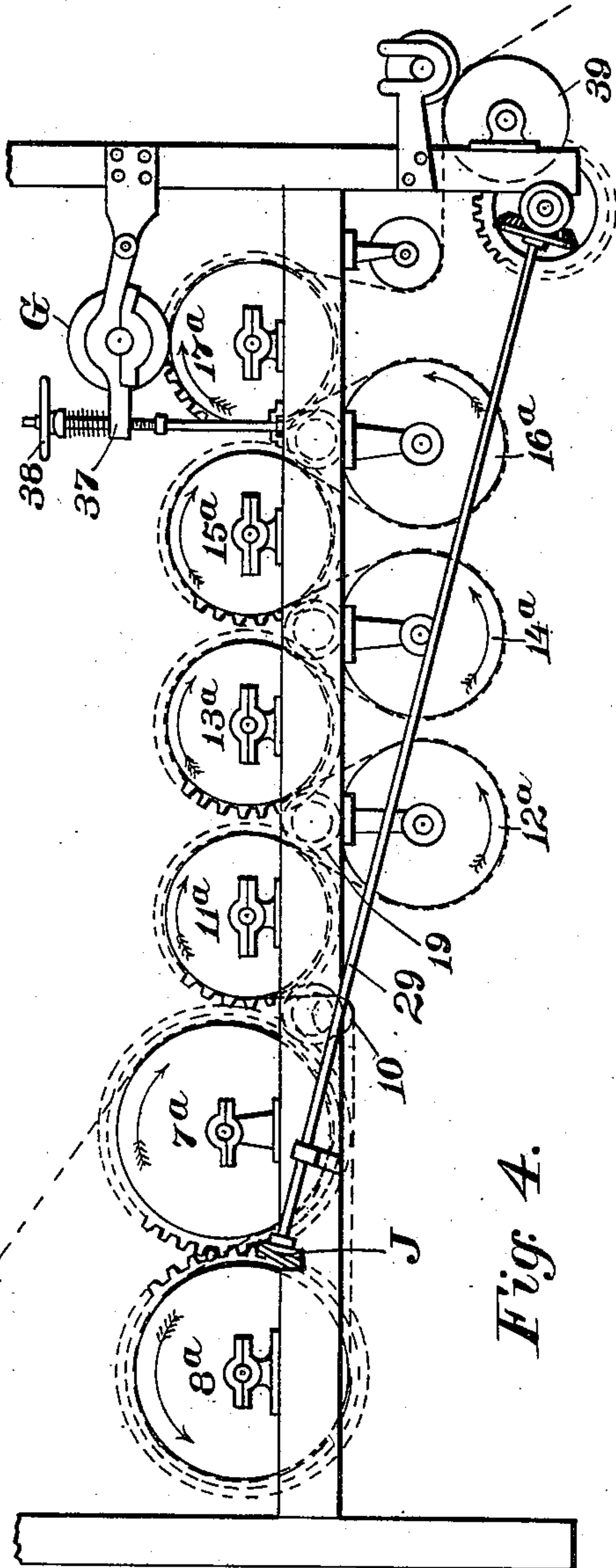


Fig. 4.

John M. McCoy Inventor

By

Watson & Watson

Attorneys

UNITED STATES PATENT OFFICE.

JOHN MCCOY, OF YORK, PENNSYLVANIA, ASSIGNOR TO THE YORK CARD AND PAPER COMPANY, OF YORK, PENNSYLVANIA.

WALL-PAPER-PRINTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 735,285, dated August 4, 1903.

Application filed November 6, 1902. Serial No. 130,359. (No model.)

To all whom it may concern:

Be it known that I, JOHN MCCOY, a citizen of the United States, residing at York, in the county of York, State of Pennsylvania, have invented certain new and useful Improvements in Wall-Paper-Printing Machines, of which the following is a specification.

This invention relates to certain improvements in wall-paper-printing machinery whereby great economy is effected both in the printing process and in the amount of floor-space required for the machinery. Heretofore the wall-paper after leaving the printing-machine has passed through a drier comprising a traveling series of sticks, over which the paper is looped. The sticks are fed to traveling conveyers from a "stick-box" and after passing through the machine are delivered again to the stick-box. This drying apparatus has usually occupied a floor-space of seventy-five to one hundred feet in length by six to eight feet in width. Furthermore, this old method of drying has been productive of great loss through the breaking of sticks, the tearing of paper, and numerous stoppages of the machinery for these reasons.

By my improvements, hereinafter described, I effect a great saving in floor-space, the drying apparatus requiring no more than one-fourth of the floor-space occupied by traveling-stick driers. I also eliminate the loss of time and material due to the breaking of sticks and the tearing of the paper, thus effecting great economy in the manufacture of wall-paper.

The invention will now be described, reference being had to the accompanying drawings, in which—

Figures 1 and 2 illustrate a machine embodying the invention in side view, the forward part of the apparatus being shown in Fig. 1 and the rear part in Fig. 2, the secondary or pattern printing machine being divided on the line A A and one-half of said machine being shown in each of said figures. Fig. 3 is a plan view of the set of drying-rolls and the calendering-rolls shown in Fig. 2. Fig. 4 is a side view of the same; and Fig. 5 is a detail view of the doctor or scraper, which is sometimes applied to one drying-roll of each set. Fig. 6 is a detail of a modification.

Fig. 7 is a transverse section through the drying device E.

Referring to Figs. 1 and 2 of the drawings, P indicates the paper strip, which travels from the roll of blank paper P' at the forward end of the machine, Fig. 1, through a primary printing-machine A, where the ground color is applied, thence over a drying device B and around a set of drying-rolls C to a secondary printing-machine D, where the pattern colors are applied, and thence successively over a drying device E, Fig. 2, around drying-rolls F, and, as shown, through calendering-rolls G, embossing-machine H, and finally to a reeling-machine I, where the finished paper is wound into rolls of suitable size and cut off. The printing, embossing, and reeling machines may be of any suitable construction.

Referring to Fig. 1, 1 indicates a feed-roll, by which the paper is drawn from the blank-roll P' and fed onto a conveyer 2, which travels slower than the periphery of the feed-roll, thus permitting a supply of paper to fold and accumulate upon the conveyer, as shown at P². The paper passes from the conveyer through a tension device 3 and thence around a printing-drum 4 of the machine A. While passing around the drum the ground color is applied to the paper by suitable printing-rolls 5. After passing around the printing-drum the paper passes over a preliminary drying device B, which preferably consists of a steam-heated slab or platform extending from the printing-machine to the series of heated drying-rolls C. As shown, the device B consists of upper and lower metal plates 6, separated by a marginal spacing-piece 6^a, the whole being connected together by a marginal row of rivets. This construction constitutes a flat steam-chest, which is preferably curved lengthwise and arranged with the convex side uppermost, so that the paper will travel in close contact with its surface. This chest is supplied with steam through a pipe 6^b, and during the operation of the machine it is kept at a high temperature, not sufficiently high, however, to in any way injure the paper, which passes over it at a rapid rate. The paper travels over this steam-heated surface with the printed side uppermost, and sufficient mois-

ture is evaporated before it reaches the drying-rolls C to thoroughly set the colors. From the stationary drier B the paper passes around a drying roll or drum 7, the plain side of the paper being in contact with said roll. In front of the roll 7 is a roll 8 of the same diameter, these rolls being arranged to revolve in opposite directions at the same speed by means of intermeshing gears 9 upon the shafts of the rolls. The paper strip embraces a large portion of the periphery of the roll 7 and is thereby further dried. After passing from the roll 7 the strip travels around the roll 8 with its printed side in contact with said roll and from thence passes around a roller 10 and a series of rolls or drums 11, 12, 13, 14, 15, 16, and 17, arranged alternately in different rows, the upper row of rolls being suitably geared together by pinions 18 and gears 19, which cause the rolls in said row to travel in the same direction and at the same peripheral speed. The lower rolls may be geared or may turn idly, and they may be heated or not heated. The arrangement of the rolls is such that the paper embraces a large portion of the periphery of each roll. The upper rolls are heated by hot air or steam, which is conveyed through a main pipe 20 and valve-controlled branch pipes 21 to the interior of the rolls through hollow shafts 22, upon which the rolls are secured. The paper is kept taut upon the drums or rolls by a feed-roll 23, from which the paper is fed onto a slow-traveling conveyer 24, adjacent to the secondary printing-machine D.

As the paper passes around the roll 8 with its printed surface in contact with the roll and before the color has become thoroughly dry it may sometimes happen that a portion of the color may adhere to the roll. In order to keep the roll clean, a scraper or doctor J (shown in detail in Fig. 5) may be arranged to bear against the face of said roll to scrape the adhering substance from the roll. This scraper preferably comprises a blade 25, mounted upon a rock-shaft 26, which shaft is movable longitudinally. The blade is held in contact with the roll by a weight 27, which is adjustably secured upon an arm 28, the latter being secured to the rock-shaft. In order to provide for the even wearing of the scraper and the roll, the scraper is reciprocated longitudinally of the roll by means of a crank-shaft 29, upon the end of which is secured a crank 30, which crank is connected to an arm 31 upon the rock-shaft 26 by a connecting-rod 32. The crank-shaft is suitably geared to the driving power and is continuously operated while the apparatus is in use. Any material scraped from the roll 8 will fall into a suitable receptacle 33, arranged beneath the scraper.

By the time the paper has passed around the entire series of drying-rolls C it has become thoroughly dry. The paper then passes onto the conveyer 24 and thence through a tension device 34, Fig. 2, to the secondary

printing-machine D, whereon the patterns are applied by suitable pattern-rolls 35. After passing from the pattern-printing machine the paper passes over a stationary drier E. This drier is similar to the drier B in Fig. 1 and is supplied with steam by a pipe 36. From the drier E the paper passes around the series of rolls F, which are the same in all respects as the series of rolls C. A scraper J' may be arranged to bear upon the forward roll 8^a of the series. While passing over the drier E and around the rolls F the coloring-matter applied by the printing-machine D is thoroughly dried. Arranged above the last roll 17^a of the series is a calendering-roll G, which is mounted upon pivoted arms 37, and a device 38 is provided for the purpose of applying tension to the roll. The paper after being dried and calendered passes through the feed-rolls 39 onto a slow-traveling conveyer-belt 40, from whence it travels through an embossing-machine H, thence back to the conveyer 40, and from said conveyer to the reeling-machine I, in which it is wound into rolls of suitable sizes for the market. In Fig. 6 I have illustrated a modification of the stationary drier, consisting of a trunk or tube 45, through which the paper P passes. Through said trunk or tube is forced a current of hot air supplied by a pipe 46. The paper may be dried in this way sufficiently to enable it to be passed about the rollers without smearing; but the steam-heated slab heretofore described is a more effective drier and at the same time inexpensive.

By making the roll or cylinder 7, around which the paper first passes, of larger diameter, so that the paper would be in contact with it for a considerable period, drying might be effected without the use of an intermediate stationary drier; but a larger cylindrical drier would be much more expensive than the stationary drier and would occupy more floor-space. I have found that the scraper or doctor for the roll 8 may generally be omitted, although it is well to provide it, to be used when running paper or colors which are difficult to dry. For all ordinary purposes I find that it may be dispensed with.

The important novel features of my invention are, first, the combination, with a wall-paper-printing machine, of a series of heated drying-rolls around which the paper is passed, said rolls being used in lieu of traveling-stick driers heretofore employed; second, the combination, with a wall-paper-printing machine, of a stationary drier over or through which the paper passes and a series of heated drying-rolls around which the paper subsequently passes, the stationary drier serving to set the colors, so that they will not adhere to the rolls; third, the combination, in a wall-paper-printing apparatus, of a primary or ground printing machine, a secondary or multicolor printing machine, an intermediate drying mechanism consisting of a stationary drier and a series of rolls, and drying devices

following the multicolor-machine and also consisting of a stationary drier and a series of rolls; fourth, the combination, with the foregoing primary and secondary printing-machines and drying devices, of the calendering-rolls, the embossing-rolls, and the reeling-machine or either of them.

I am aware that heated rolls for drying are not broadly novel; but I believe myself to be the first to use heated rolls for drying paper as it comes from a wall-paper-printing machine either with or without the intermediate stationary drier. The latter, however, is a very important element of my present invention. As heretofore stated, my invention, which is now in practical use, results in great economy in operation and economy of space occupied as compared with the wall-paper printing and drying apparatus heretofore used.

It is understood that no novelty is claimed for the particular printing, calendering, embossing, and reeling mechanisms shown in the drawings and that any equivalent machines may be substituted for those illustrated.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an apparatus for printing wall-paper, the combination of a machine for applying color to a continuous strip of paper, a series of drying-rolls, means for heating the same, a stationary drying device between said machine and rolls, and means for passing the paper after it leaves the machine first across said drying device and then over said heated rolls to thoroughly dry the same.

2. In an apparatus for printing wall-paper, the combination of a machine for applying a plurality of colors to a continuous strip of paper, a stationary heated plate or surface arranged adjacent to said machine, and a series of heated rolls, the said elements being so arranged that the paper passes from the printing-machine across said heated plate in contact therewith and then over said drying-rolls, for the purpose set forth.

3. In an apparatus for printing wall-paper, the combination of a machine for applying a plurality of colors to a continuous strip of paper, a steam-chest arranged adjacent to said machine, and a series of heated rolls, the said elements being so arranged that the paper passes from the printing-machine across said steam-chest in contact therewith and then over said drying-rolls, for the purpose set forth.

4. In an apparatus for printing wall-paper, the combination of the following elements arranged and operating on a continuous strip of paper in the order mentioned, viz: a primary printing-machine, a stationary drying device, a series of heated drying-rolls, a secondary printing-machine, a second stationary drying device, and a second series of drying-rolls, for the purpose set forth.

5. In an apparatus for printing wall-paper,

the combination of the following elements arranged and operating on a continuous strip of paper in the order mentioned, viz: a printing-machine for applying a ground color, a stationary steam-heated drying-surface, a series of steam-heated drying-rolls, a multicolor-printing machine, a second stationary steam-heated drying-surface, and a second series of drying-rolls, for the purpose set forth.

6. In an apparatus for printing wall-paper, the combination of the following elements arranged and operating on a continuous strip of paper in the order mentioned, viz: a primary printing-machine, a stationary drying device, a series of heated drying-rolls, a secondary printing-machine, a second stationary drying device, a second series of drying-rolls, and a reeling-machine, for the purpose set forth.

7. In an apparatus for printing wall-paper, a printing-machine, a drying-roll around which the paper from said machine travels on its plain side, a stationary heated plate between said machine and roll, a second drying-roll around which the paper travels on its printed side, and a scraper arranged to bear against said latter roll.

8. In an apparatus for printing wall-paper, a printing-machine, a drying-roll around which the paper from said machine travels on its plain side, a second drying-roll, around which the paper travels on its printed side, a scraper arranged to bear against said second roll, and a plurality of drying-rolls succeeding said second roll.

9. In an apparatus for printing wall-paper, a printing-machine, a drying-roll around which the paper from said machine travels on its plain side, an adjacent drying-roll around which the paper travels on its printed side, a scraper arranged to bear against said latter roll, and means for automatically reciprocating said scraper longitudinally of the roll.

10. In an apparatus for printing wall-paper, a printing-machine, a drying-roll around which the paper from said machine travels on its plain side, an adjacent drying-roll around which the paper travels on its printed side, a pivotally-mounted scraper arranged to bear against said latter roll and movable longitudinally thereof, a suitably-driven crank, and a rod connecting said crank with the scraper, said rod and crank being adapted to reciprocate the scraper.

11. An apparatus for printing and finishing wall-paper comprising a primary printing-machine, a series of drying-rolls, a secondary printing-machine, a second series of drying-rolls, calendering-rolls, an embossing-machine, and a reeling-machine arranged to receive and operate upon the paper strip successively.

12. An apparatus for printing and finishing wall-paper comprising, a primary printing-machine, a series of drying-rolls, a secondary printing-machine, a second series of drying-rolls, calendering-rolls, an embossing-ma-

chine, a reeling-machine arranged to receive and operate upon the paper strip successively, and a stationary drying device for the strip between each printing-machine and the succeeding series of rolls.

13. An apparatus for printing and finishing wall-paper comprising, a primary printing-machine, a series of drying-rolls, a secondary printing-machine, a second series of drying-rolls, calendering-rolls, an embossing-machine, a reeling-machine arranged to receive and operate upon the paper strip successively, and slow-traveling conveyers arranged to support the strip and convey it to each of said machines.

14. In an apparatus for printing wall-paper, the combination of the following elements arranged to operate upon a continuous strip of paper, viz: a primary printing-machine, drying-rolls about which the paper passes, a secondary printing-machine, and means between the drying-rolls and said secondary printing-machine for receiving an accumulation of slack paper from the drying-rolls and delivering the same to the secondary printing-machine.

15. In an apparatus for printing wall-paper, the combination of the following elements arranged and operating upon a continuous strip of paper in the order mentioned, viz: a primary printing-machine, drying-rolls, a con-

veyer arranged to move at a rate slower than the paper and upon which the paper accumulates as it leaves the drying-rolls, and a secondary printing-machine arranged to take the paper from said conveyer.

16. In an apparatus for printing wall-paper, the combination of the following elements arranged and operating upon a continuous strip of paper in the order mentioned, viz: a printing-machine, drying-rolls about which the paper passes, a conveyer traveling at a slower rate than the paper and upon which the paper accumulates, and an embossing-machine arranged to take the paper from said conveyer.

17. In an apparatus for printing wall-paper, the combination of the following elements arranged and operating upon a continuous strip of paper in the order mentioned, viz: a printing-machine, drying-rolls, a conveyer traveling at a slower rate than the paper and upon which the paper accumulates, and a reeling-machine adapted to take the paper from said conveyer.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN MCCOY.

Witnesses:

JOHN S. MCCOY,
CHARLES A. MAY.