

No. 897,482.

PATENTED SEPT. 1, 1908.

J. C. PERHAM.  
BLUE PRINTING MACHINE.

APPLICATION FILED MAY 12, 1903.

Fig. 1.

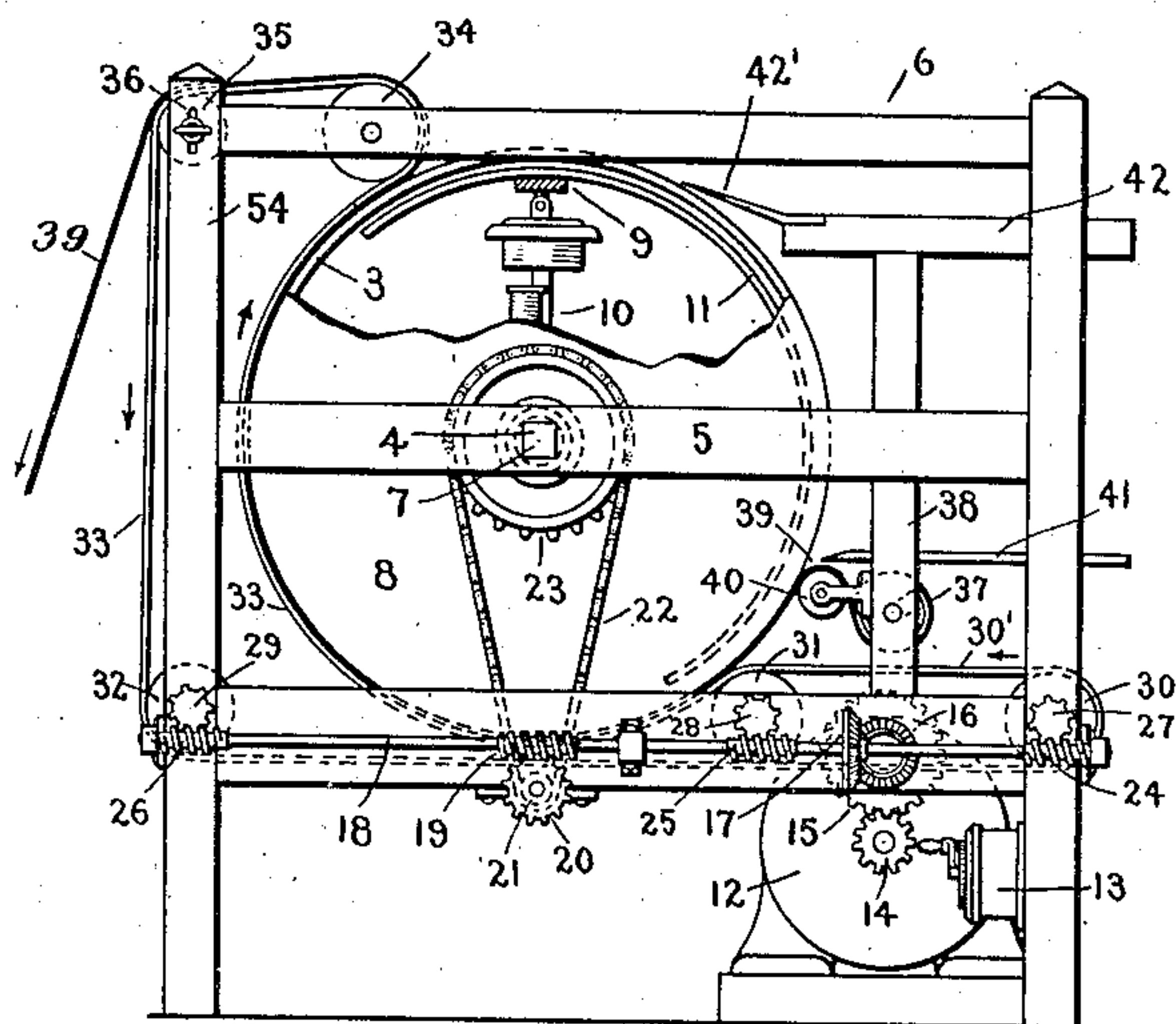
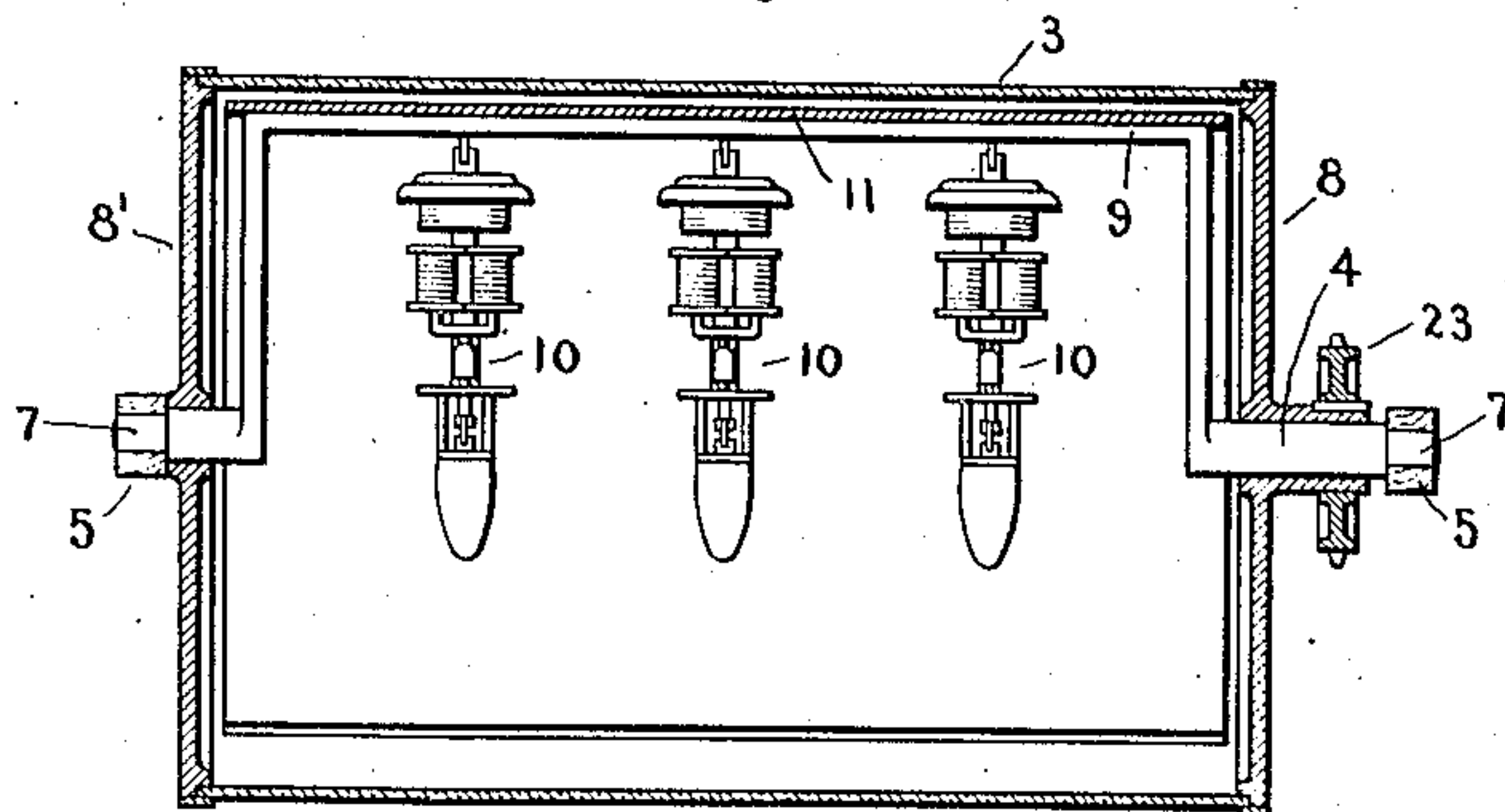


Fig. 2.



Witnesses.

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# UNITED STATES PATENT OFFICE.

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## BLUE-PRINTING MACHINE.

No. 897,482.

Specification of Letters Patent.

Patented Sept. 1, 1908.

Application filed May 12, 1903. Serial No. 156,794.

*To all whom it may concern:*

Be it known that I, JAMES C. PERHAM, a citizen of the United States, residing in the township of Glenville, county of Schenectady and State of New York, have invented certain new and useful Improvements in Blue-Printing Machines, of which the following is a specification.

My invention relates to machines for making blue - prints or similar photographic prints.

The methods of blue-printing now commonly employed require the use of relatively stationary flat or cylindrical printing-frames. In using these frames it is necessary to adjust the sensitized or chemically-prepared paper, tracings and pads in position within the frame and also adjust the screws and clamps for holding the paper, etc., before an exposure can be made. The time required for preparing to make the exposure in these methods is by far the largest portion of the whole time required to make the blue-prints. Furthermore, it is necessary to remove the exposed paper from the frame by hand and carry it to a washing machine and then to a drying chamber. When it is considered that in many large concerns several acres of prints are made daily, the amount of time lost in preparing the printing-frames for exposure and in handling the paper after it has been exposed is very great.

The object of my invention is to reduce the time required to make the blue-prints, especially the time required to prepare the tracings and the paper for printing, and a further object of my invention is to so organize a machine that it will print any size and shape of drawing expeditiously upon a continuous moving sheet of sensitized paper.

My invention comprises a printing-machine which embodies a rotatable cylinder of glass, or other transparent or translucent material, around which a continuous strip of sensitized paper and the tracings are adapted to pass and within which is mounted a source of illumination such as an electric arc lamp or the like.

Referring to the drawings, which illustrate the preferred embodiment of my invention, Figure 1 is a side elevation of the blue-printing machine, and Fig. 2 is a longitudinal section through the rotatable cylinder of the blue-printing machine.

Referring now to Fig. 1, 3 represents a cylinder of glass or other transparent or translucent material mounted upon the shaft 4 which is fixed in the cross-bars 5 of the frame 6 on the machine. This shaft 4 has squared ends 7 which fit in correspondingly squared openings in the cross-bars 5 to prevent the rotation of said shaft. The cylinder 3 is provided with end disks 8 and 8', preferably opaque, rotatably mounted on the shaft 4 as shown in Fig. 2. The shaft 4 is formed with an upwardly bent part 9 within the cylinder 3 and acts as a support for the lamps 10 and also as a support for the semi-cylindrical shield 11 of opaque material also mounted within the cylinder.

The cylinder 3 is rotated by means of the motor 12 which may be run at any desired speed through the agency of the controlling rheostat 13. A pinion 14 on the end of the motor shaft engages with the gear 15 which is mounted on the same shaft with the bevel gear 16. Said bevel gear 16 engages with the bevel gear 17 mounted on the shaft 18 which extends the entire length of the machine and carries the worm-gear 19 which meshes with the worm-wheel 20. Mounted on the same shaft with the worm-wheel 20 is a sprocket wheel 21, shown in dotted lines in Fig. 1, around which is passed a sprocket chain 22 which also engages with the large sprocket wheel 23 rigidly mounted on the hub of the end disk 8, as shown in Fig. 2. Also mounted on the shaft 18 are worm gears 24, 25 and 26 which mesh with the worm-wheels 27, 28 and 29 respectively. These last-mentioned worm-wheels are mounted on the ends of the shafts which carry the feeding rollers 30, 31 and 32 respectively. Around these rollers passes the endless belt or webbing 33 of cotton cloth, duck or other flexible material which also passes around the roller 34 and the belt-tightening roller 35 in the upper part of the frame of the machine. The roller 35 is vertically adjustable in the slots 36 which are formed in the uprights 54 of the frame of the machine. The said endless webbing or feeding-belt 33 passes over the roller 31, remains in contact with the outer surface of the cylinder 3 until it reaches the roller 34, then passing around said roller, it moves over the tightening-roller 35, thence under the roller 32 and around the roller 30 to the roller 31 again.



The roll 37 of sensitized or chemically-treated blue-print paper 39 is mounted in the uprights 38 of the machine, and the paper 39 as it leaves said roll 37 passes over the roller 40 and into contact with the cylinder 3 being then taken up and fed forward by the feeding-belt 33. The shelf 41 is provided for the reception of tracings, drawings, etc., from which blue - prints are to be made. This shelf is removably mounted in the frame 6 of the machine so that it can be taken out when it is desired to replace the exhausted roll 37 of sensitized paper by a fresh roll of paper. The shelf 42 is provided for the purpose of receiving the tracings which have passed through the printing machine. The flexible strip or series of fingers 42' rest against the surface of the cylinder and automatically remove the tracings from said cylinder.

In the operation of this machine, the motor is started and its speed is regulated by the rheostat 13 until the printing cylinder 3 moves at the speed necessary to produce the proper results required for the work in hand. The endless belt or webbing 33 is thus moved in the direction indicated by the arrows. Then the roll 37 of blue - print paper is mounted in the frame of the machine and the paper is threaded over the roller 40, around the cylinder 3 between the surface of said cylinder and the belt 33, then over the rollers 34 and 35, from which it passes into the washing machine.

As the sensitized paper is moved through the machine, the tracings are fed one by one between the cylinder 3 and the roller 40 from the shelf 41. While the tracings are being adjusted and fed into the machine the sensitive paper 39 is prevented from being acted upon by the light within the cylinder by means of the semi - cylindrical shield 11. Just after the paper and tracings come into engagement with the endless feeding-belt 33, they pass beyond the edge of the protecting shield 11 and the said paper is subjected to the action of the rays of light emanating from the lamps 10 and passing through the tracings. The shield 11 also protects the paper from the direct rays of the light within the cylinder as it leaves the machine and protects the eyes of the operator from said rays. As the exposed paper passes over the roller 34, the tracings continue around the cylinder 3 and are collected on the shelf 42 from which they can be taken by the operator and removed to the shelf 41 to be passed through the machine again if so desired.

By the use of the endless belt 33, the speed of which is exactly equal to the peripheral speed of the cylinder 3, I am enabled to hold the tracings and paper tightly against the surface of the cylinder while the paper is subjected to the rays of light emanating from the lamps 10, and thus prevent wrinkling of the paper and tracings and also prevent a

relative movement of the tracings and the paper.

The machine is preferably operated in a relatively darkened room. If operated in a brilliantly lighted room, the exposed parts of the strip of sensitized paper should be protected by hoods of opaque material.

If desired, the tracings may be rolled up in position within the roll of sensitized paper before placing the latter in the machine, in which case the feeding shelf 41 would not be necessary. Furthermore, if it is desired to print small pieces of sensitized paper instead of a continuous strip, the paper and tracings are arranged upon the surface of the belt 33 at 30' and are fed into the machine together at the roller 31 between the endless belt 33 and the cylinder 3, thereby dispensing with the shelf 41, roll 37 and roller 40. The flexible strip 42' then acts to remove automatically from the machine the pieces of exposed paper and the tracings and land them on the receiving table 42.

I do not desire to restrict myself, except as the scope of the appended claims demands, to the particular form or arrangement of parts herein shown and described, since it is apparent that they may be changed and modified without departing from my invention.

What I claim as new and desire to secure by Letters Patent of the United States, is—

1. In a blue-printing machine, a rotatable cylinder of transparent or translucent material, a source of illumination mounted within said cylinder, means for driving said cylinder at any desired rate of speed, means for maintaining a strip of sensitized paper in contact with the outer surface of said cylinder, and mechanism for moving said paper-maintaining means through the machine at a speed corresponding to the peripheral speed of said cylinder.

2. In a blue-printing machine, a cylinder of transparent or translucent material, a source of illumination mounted within said cylinder, means for driving said cylinder at any desired rate of speed, an endless belt of flexible material for maintaining a strip of sensitized paper in contact with the outer surface of said cylinder, and mechanism for moving said belt through the machine at a speed corresponding to the peripheral speed of said cylinder.

3. In a blue-printing machine, a rotatable cylinder of transparent or translucent material, an endless belt adapted to maintain a strip of sensitized paper in contact with the surface of said cylinder, means for driving said cylinder, separate mechanism whereby said belt is moved at a speed corresponding to the peripheral speed of said cylinder, and means for adjusting the tension of said endless belt.

4. In a blue-printing machine, a cylinder



of transparent or translucent material rotatably mounted on its longitudinal axis, means for driving said cylinder, means for maintaining a strip of sensitized paper and a tracing tightly against the outer surface of said cylinder during part of a revolution, and flexible fingers for automatically removing the tracing and the paper from the surface

of said cylinder after the paper has been subjected to the rays of light. 10

In witness whereof, I have hereunto set my hand this eleventh day of May, 1903.

JAMES C. PERHAM.

Witnesses:

BENJAMIN B. HULL,  
HELEN ORFORD.