No. 704,232. Patented July 8, 1902.

R. A. BELL.

MACHINE FOR MAKING BLUE PRINTS.

(Application filed Nov. 15, 1901.)

(No Model.)

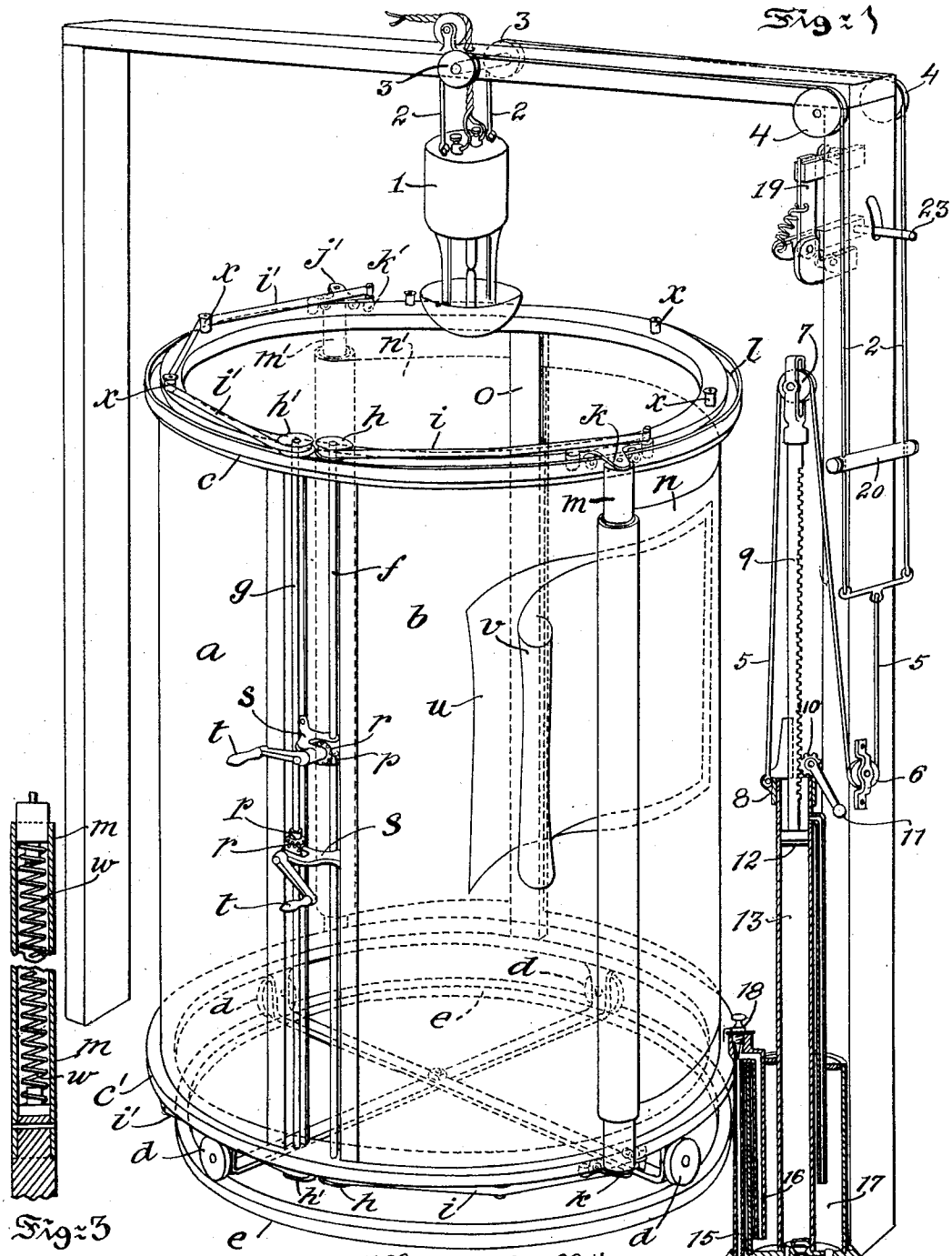


Fig. 1

Fig. 3

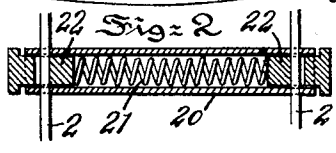


Fig. 2

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UNITED STATES PATENT OFFICE.

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MACHINE FOR MAKING BLUE-PRINTS.

SPECIFICATION forming part of Letters Patent No. 704,232, dated July 8, 1902.

Application filed November 15, 1901. Serial No. 82,462. (No model.)

To all whom it may concern:

Be it known that I, ROBERT ANGELO BELL, a citizen of the United States, and a resident of the city and county of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Machines for Making Blue-Prints, of which the following is a specification.

My invention relates to improvements in machines for making blue or other prints by artificial light; and the object of my invention is to furnish an apparatus of this character which will be adapted to make prints of widely-varying size, and, if desired, a number of different prints simultaneously.

My invention consists of two parts, viz: first, a glass cylinder against which the tracing, negative, or print to be copied is placed and means for holding against this tracing, negative, or print the sensitive paper to which an image of the tracing, negative, or print is to be transferred, and, second, of means for steadily passing through said cylinder a light, preferably an electric-arc light, which will act upon said sensitive paper to fix thereon the image carried by the tracing, negative, or print.

In the accompanying drawings, forming part of this specification, Figure 1 is a perspective view of my print-making machine, the hydraulic means for governing the movement of the lamp being shown in section; Fig. 2, a sectional view through the adjustable stop for operating the cut-out controlling the current to the lamp; Fig. 3, a longitudinal section through one end of the spring-actuated curtain-rollers.

For convenience in construction my glass cylinder is made in two parts *a b*, which are held at the top and bottom by metallic rings *c c'*. The lower ring *c'* is carried upon rollers *d*, which travel upon a circular track *e*. By means of these rollers the cylinder and its connected parts may be revolved around its vertical axis for convenience in adjustment of the paper, &c.

f g are vertical shafts carried at the top and bottom by rings *c c'* and carrying at each end rollers *h h'*, to which are attached one end of a belt or chain *i i'*, the other end of which is attached to a carriage *j j'*, which is furnished with rollers *k k'*, which are carried by and travel in a groove *l* on top of the ring *c* and on the bottom of the ring *c'*, the rings *c c'* being identical in form, their construction being clearly shown by the ring *c*.

Carried by carriages *k k k' k'* are rollers *m m'*, similar in construction to the ordinary Hartshorn window-shade roller, and shown in section in Fig. 3. The rollers *m m'* carry curtains *n n'*, the outer ends of which are permanently secured, by preference, to a strip *o*, carried by rings *c c'*. Upon the shafts *f g* are bevel-gears *p*, and meshing with these gears are gears *r*, which are carried by brackets *s* and which may be revolved by cranks *t*. By revolving cranks *t* in one direction the shafts *f g* will be revolved, so as to wind ribbons *i i* upon rollers *h h'* and draw carriages *k k'* and rollers *m* toward the shafts. As the rollers *m* are drawn toward shafts *f g* the curtains *n* are unwound from the rollers and lie against the glass cylinder, against which has been placed the tracing, negative, or print *u*, backed by the sensitive paper *v*, and the spring *w* is wound up. The tracing and sensitive paper are held tightly against the glass cylinder by the curtain until the print has been made, when a reversal of the cranks *t* will release ribbons or belts *i*, and the spring *w*, Fig. 3, of the rollers *m*, unwinding, will revolve the rollers *m* and wind thereon the curtains *n*. It will be observed that the winding of the curtains upon rollers *m* will draw carriages away from the shafts *f g*, releasing the tracing and sensitive paper, which may be then removed.

x represents pins or rollers carried by rings *c c'*, which cause the belts or chains to travel in a circumferential path.

The cranks *t t* may be operated simultaneously, or but one of them may be operated, if it be desired to use but one side of the cylinder for printing purposes.

The tracing and sensitive paper being in place on the glass cylinder an electric-arc lamp *l* is lowered slowly and steadily through the cylinder, its rays acting equally upon all parts of the tracing and fixing the lines of the tracing upon the sensitive paper. It is necessary that the lamp be moved steadily, so that all parts of the sensitive paper may

be subjected to the same amount of light; otherwise some parts may be overexposed while others would be underexposed. To cause the lamp to be moved steadily, I carry it upon a cord or cords 2, which pass over pulleys 3 4 to a continuation or another cord 5, which passes around a pulley 6, then up and over a pulley 7, then down to a fastening 8. The pulley 7 is carried upon the upper end of a toothed rod 9, which gears with a gear 10, which may be rotated by a crank 11. The lower end of rod 9 is secured to a piston 12, working in a cylinder 13, which contains some liquid. The lower end of piston 13 is connected to a reservoir 17 by a passage 14, which leads to a passage 15, and the latter to a passage 16, connecting with the under part of reservoir 17, as shown. The flow of liquid from cylinder 13 to reservoir 17 is controlled by a valve 18 in passages 15 or 16. 19 is a pipe connecting top of cylinder 13 with reservoir 17, which will carry to the reservoir any liquid that may find itself on top of piston 12. The pulley 7 and rod 9 having been raised by means of gear 10, the lamp will be in the position shown in the drawings. The valve 18 is now opened and the liquid allowed to escape from cylinder 13 to reservoir 17, permitting piston 12 to sink and with it the lamp 1. The rapidity of movement of the lamp will depend upon the amount that valve 18 is opened. The lamp having traversed the cylinder, or so much of it as may be necessary, the current is shut off through switch 19, when the prints may be removed from the cylinder and washed or otherwise treated, as may be necessary. A new set of prints may now be placed in the machine, the lamp again lifted, lighted, and dropped, and so on.

20 is a stop carried by cords 2, which is furnished with a spring 21, which normally forces the pieces 22 against cords 2. The stop 20 can be moved up or down on the cords 2 and is adapted to engage the pin 23 to operate the cut-out to extinguish the light. The higher that stop 20 is moved the sooner will the lamp be extinguished, and vice versa. This device is useful when but a small print is being made and it is only desired to have the lamp lighted for a portion of its travel. The device is also useful for automatically extinguishing the lamp when it is at the end of its full travel through the cylinder.

Having thus described my invention, I claim—

1. The combination in a machine for making prints, of a glass platen, a curtain one end of which is secured to a line along said platen, a spring-actuated roller to which the other end of said curtain is secured, and means for drawing said roller across said platen.

2. In a machine for making prints, in combination, a glass cylinder, rings secured to the top and bottom of said cylinder, a curtain one end of which is fixed to said cylinder, a spring-actuated roller to which the other end of said curtain is secured, means carried by said rings for carrying said roller, and means for drawing said roller and connected parts circumferentially around said glass cylinder.

3. In a machine for making prints, in combination, a sectional glass cylinder, metallic rings carried by and securing the ends of said sections, a curtain secured to said cylinder upon a line parallel with its axis, spring-actuated rollers upon which the ends of said curtain are rolled, means carried by said rings for carrying said rollers, and means for drawing said rollers circumferentially around said glass cylinder toward one another and away from the point at which said curtain is secured to said cylinder.

4. In a machine for making prints, in combination, a glass cylinder, metallic rings carried by the ends of said cylinder furnished with grooves concentric with said cylinder, a curtain one end of which is secured to said cylinder, a spring-actuated roller to which the other end of said curtain is secured, carriages carried by said rings carrying the ends of said roller and being guided in their movements by said grooves in said rings, a shaft, pulleys upon said shaft, belts secured at one end to said carriages and at the other to said pulleys, a gear-wheel upon said shaft, a gear-wheel meshing with said first gear, and means for revolving said latter gear.

5. The combination with the glass cylinder and the curtains as described, of a lamp, a cord one end of which is secured to said lamp and the other to a fixed point, a stationary pulley under which said cord passes, a movable pulley over which said cord passes, a rod carrying said latter pulley, a piston to which said rod is secured, a cylinder in which said piston works, a reservoir, a connection between said reservoir and said cylinder, and a valve by means of which the flow of liquid from said cylinder to said reservoir, or vice versa, may be controlled.

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