

No. 789,773.

PATENTED MAY 16, 1905.

J. H. WAGENHORST.  
BLUE PRINTING APPARATUS.

APPLICATION FILED MAY 13, 1904.

3 SHEETS—SHEET 1.

Fig. 1.

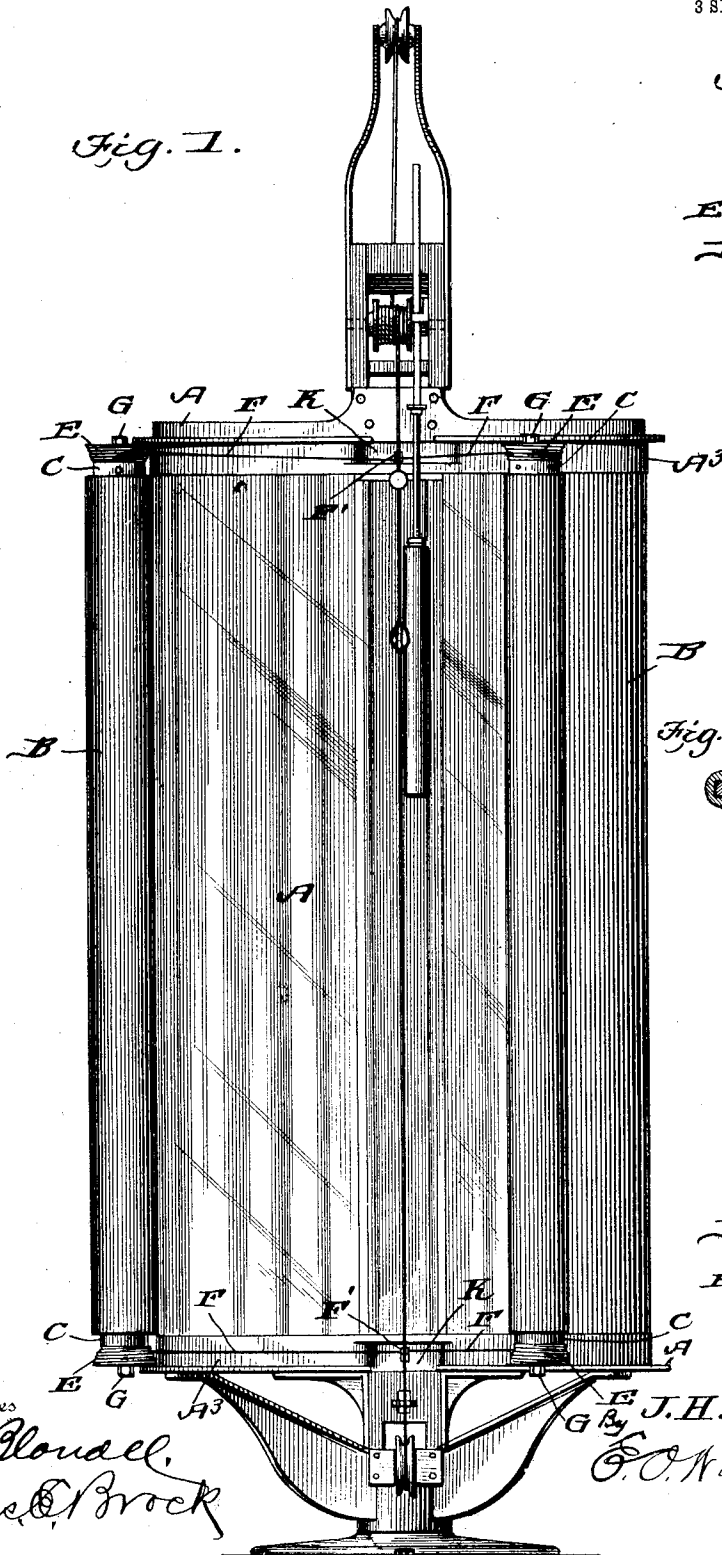


Fig. 76.

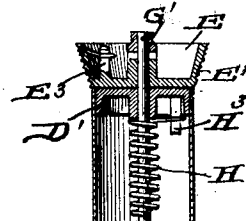
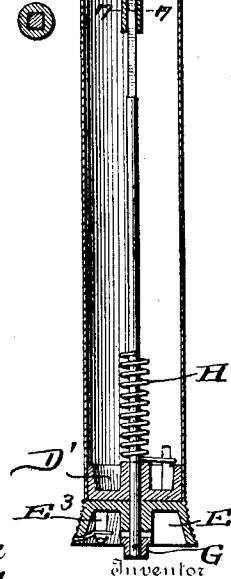


Fig. 77.



Witnesses  
M. H. Clouall,  
Chas. C. Brock

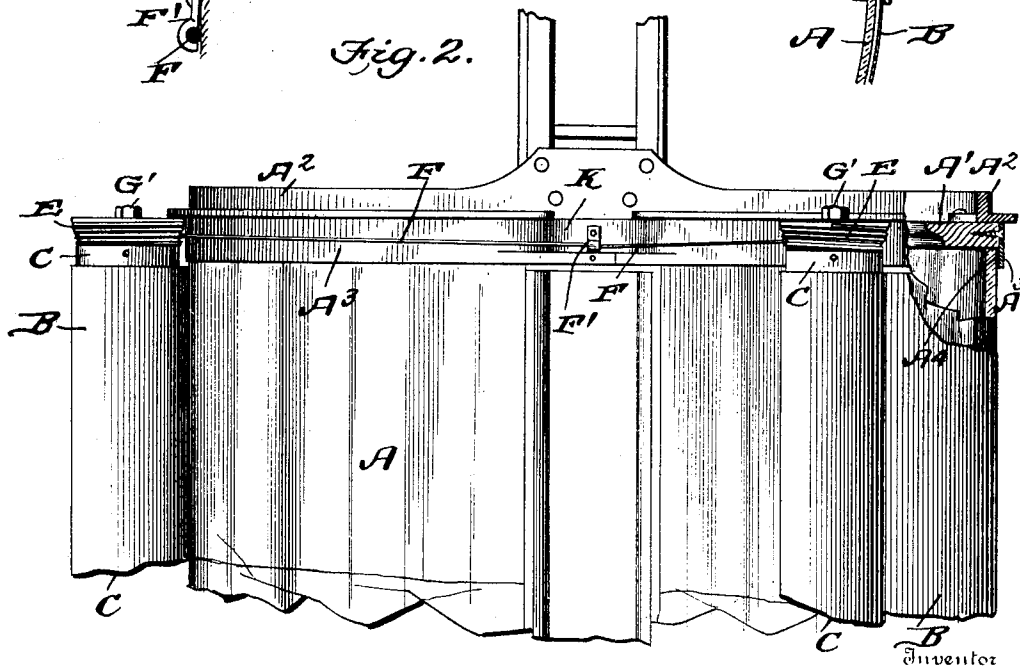
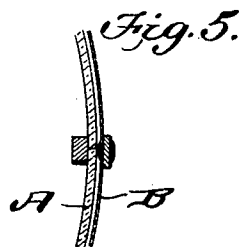
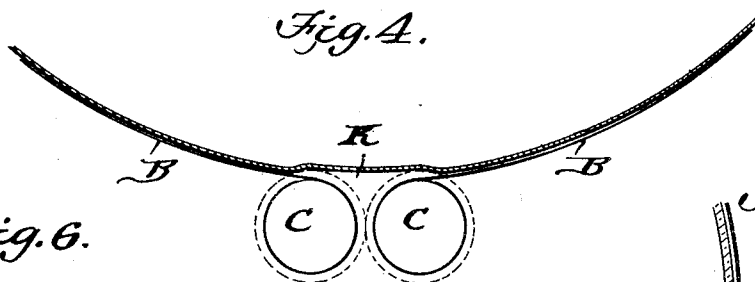
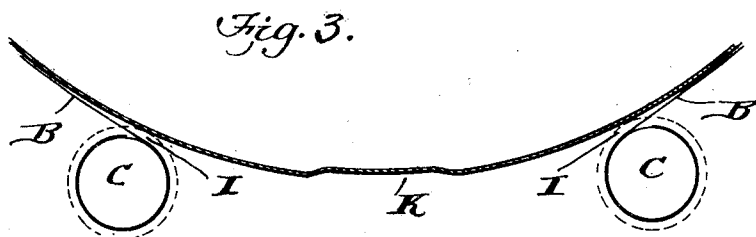
J. H. Wagenhorst  
G. O. Wagenhorst  
Attorney

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3 SHEETS—SHEET 2.



Witnesses

Mr. Blouel.  
Chas. E. Brock

*J. H. Wagenhorst*

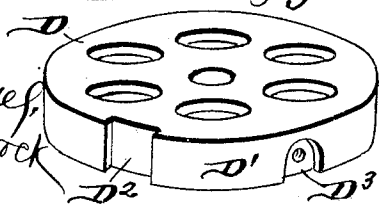
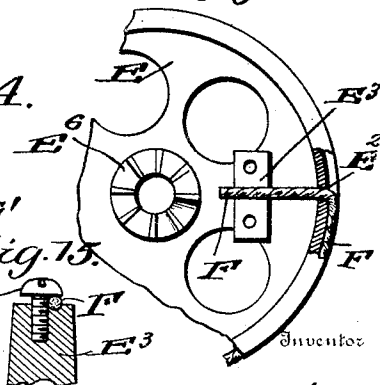
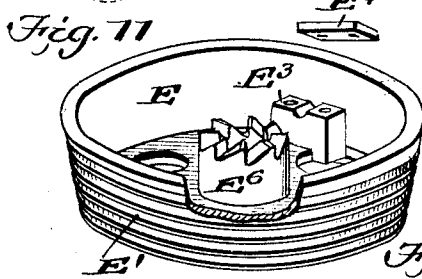
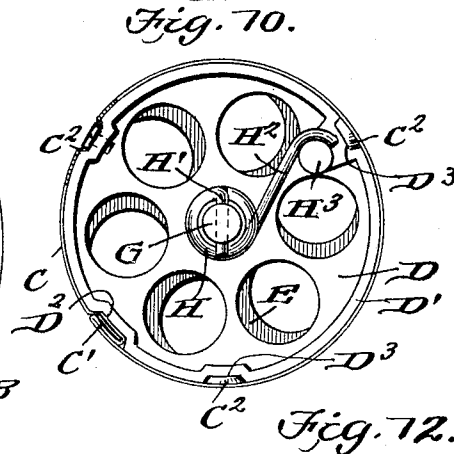
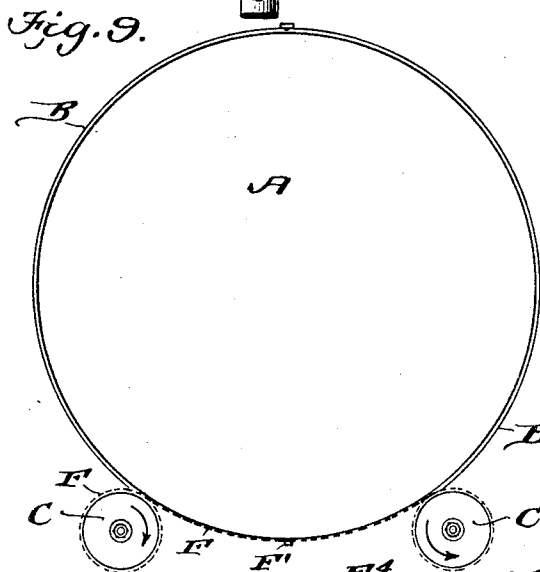
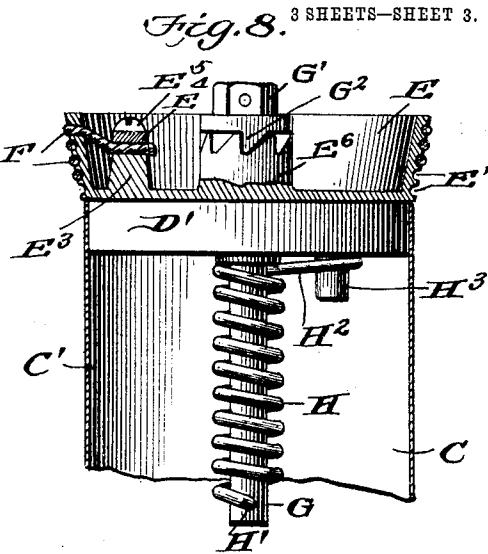
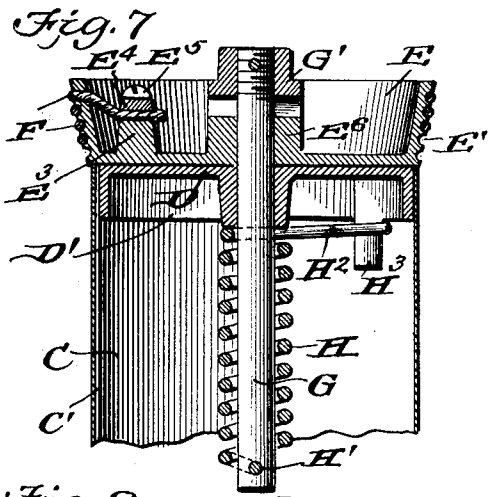
 $\mathfrak{M}_1$ 

E. O. Wagenhorst  
Attorney

Attorney

J. H. WAGENHORST.  
BLUE PRINTING APPARATUS.  
APPLICATION FILED MAY 18, 1904.

3 SHEETS—SHEET 3.



Witnesses  
M. J. Cloude,  
Chas. E. Brock

*J. H. Wagenhorst.*  
*E. O. Wagenhorst*  
Attorney

# UNITED STATES PATENT OFFICE.

JAMES H. WAGENHORST, OF MANSFIELD, OHIO.

## BLUE-PRINTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 789,773, dated May 16, 1905.

Application filed May 13, 1904. Serial No. 207,725.

*To all whom it may concern:*

Be it known that I, JAMES H. WAGENHORST, a citizen of the United States, residing at Mansfield, in the county of Richland and State of Ohio, have invented a new and useful Improvement in Blue-Printing Apparatus, of which the following is a specification.

This invention relates generally to an electric blue-printing apparatus, and more particularly to the construction, attachment, and operation of the curtain used in connection with the transparent cylinder for the purpose of holding the tracings and prints in place.

The object of my invention is to provide a single curtain capable of completely enveloping the entire transparent cylinder and provided with a roller at each end, so that the said curtain can be rolled or unrolled from either end.

Another object of the invention is to provide a curtain connected at each end to rollers which contain means for creating a tension upon the curtain throughout its entire length whereby the curtain is tightly held to the surface of the cylinder over which it is stretched, said tension means being so connected with the means for retaining the rollers in place upon the cylinder that the curtain is not only stretched taut, but the rollers held firmly against the cylinder.

Another object of the invention is to so construct the various parts that all strain upon the glass cylinder is removed and said strain communicated to wood or metal parts capable of standing the strain.

Another object of the invention is to provide for increasing or decreasing the tension, as the occasion may require.

With these objects in view and also with certain other objects, as will hereinafter appear, the invention consists in various features of construction and arrangement, all of which will be fully described hereinafter, and pointed out in the claims.

In the drawings forming a part of this specification, Figure 1 is a face view of the blue-printing apparatus provided with my improved form of curtain and rollers. Fig. 2 is an enlarged elevation, partly in section, show-

ing the upper portion of the cylinder. Fig. 3 is a detail sectional view showing the relative positions of the cylinder, rollers, and curtain when the said rollers are being revolved about the cylinder. Fig. 4 is a detail sectional view showing the relative positions of said parts when the rollers are brought together and the entire cylindrical surface enveloped by the curtain. Fig. 5 is a detail sectional view showing the joint at the rear between the two sections of the cylinder. Fig. 6 is a detail sectional view showing the clip for connecting the cable to the cylinder. Figs. 7 and 8 are sectional views showing one end of the roller and the tension device connected thereto, said views being taken upon different planes. Fig. 9 is a diagrammatic plan view illustrating the operation of the curtain and rollers. Fig. 10 is an inverted plan view of the stationary portion of the tension device. Fig. 11 is a detail perspective view of the tapering ferrule. Fig. 12 is a detail sectional plan of said part. Fig. 13 is a detail perspective view of the stationary cap-piece upon which the ferrule is mounted, and Figs. 14 and 15 show details of construction. Fig. 16 shows a slight modification in which the ferrules are connected to the opposite ends of a shaft passing through the roller. Fig. 17 is a detail section on the line 17 17 of Fig. 16.

In carrying out my invention I employ a glass cylinder A, which may be made in a single piece or in sections, as preferred. At the top and bottom of the glass cylinder are arranged the wooden rings A', the outer diameter of which is coextensive with the outer diameter of the cylinder. Flanged rings A<sup>2</sup> are secured to the wooden ring A', and a metallic band A<sup>3</sup> is also secured to the wooden ring and surface to hold the cylinder, wooden ring, and flanged rings in their proper positions, a packing of felt or other material A<sup>4</sup> being interposed between the metallic band and the cylinder, as most clearly shown in Fig. 2.

B indicates the curtain, which is of sufficient length to completely envelop or surround the glass cylinder and also wrap one or more times around the rollers C. These rollers C

may be made solid or hollow, as preferred, and if made hollow they may be made of seamless tubing, or they can be made with a seam C', as most clearly shown in Fig. 10, said seam being turned inwardly, as shown. The end of the curtain is preferably glued to the roller; but, if desired, the end may be turned into the seam at the same time the seam is formed. Each roller has a cap-piece D rigidly fitted into each end thereof, said cap-piece being flanged, as shown at D', and said flange is recessed, as shown at D<sup>2</sup>, to receive the seam C' and is provided with one or more recesses D<sup>3</sup> to receive the depressions C<sup>2</sup>, produced in the ends of the rollers, thereby securely fastening the cap-piece D in the end of the roller. The outer surface of the cap-piece D is flush with the end of the roller, as most clearly shown in Figs. 7 and 8, and arranged upon each cap-piece is a tapering ferrule E, said ferrules being widest at their outer ends—that is, the ferrules upon the tops of the rollers are widest at their upper ends and the ferrules upon the bottom of the rollers are widest at their lower ends. The exterior of each ferrule is provided with a helical groove E', the grooves of the opposing ferrules extending in opposite directions—that is, the ferrules of the right-hand roller are provided with right-hand threads and the ferrules of the left-hand roller are provided with left-hand threads—and in manufacturing these ferrules they are marked "R" and "L" in order to designate the right and left hand rollers, so that in assembling the parts no difficulty will be had. A wire strand or cable F is connected at its center to the front central line of the cylinder by means of a clip F', and the ends of this wire strand are connected to the opposite ferrules after being partially carried around said ferrule, as most clearly shown in Figs. 7, 8, and 12, the extreme end of the strand or cable being passed through an aperture E<sup>2</sup> and fastened to a post E<sup>3</sup> by means of a clip-plate E<sup>4</sup> and screw E<sup>5</sup>. The helically-grooved ferrule E is pivotally connected to the cap-piece D by means of a bolt G, which passes through a ratchet-faced boss E<sup>6</sup>, which surrounds the central opening produced in the bottom of the ferrule, said bolt passing downwardly through a central opening in the cap-piece. This bolt G has a head G', which carries the dog G<sup>2</sup> upon the lower side thereof, which dog is adapted to engage the ratchet-faced boss E<sup>6</sup>. A spiral spring H surrounds that portion of the bolt G which extends into the roller, the lower end of said spring being connected to the lower end of the bolt, as shown at H', and the upper end H<sup>2</sup> is adapted to engage a downwardly-extending lug H<sup>3</sup>, formed integral with the cap-piece D and projecting into the tube or roller, as most clearly shown in Figs. 7, 8, and 10. By turning the bolt-head, consequently the bolt, any desired tension can be placed upon the

helically-grooved ferrule, and the tension upon the ferrule is of course transmitted to the cable and likewise to the roller and curtain, and after the parts have been once adjusted the tension will always remain the same. It will of course be understood that the curtain rolls upon the roller in a direction opposite to the manner in which the wire strand or cable winds upon the ferrule.

In operation the curtain is attached to the rollers as previously described and arranged about the glass cylinder, and the rollers are arranged between the top and the bottom flanged rings A<sup>2</sup>, the tapering ferrules contacting with the said flanged rings and with the metallic bands A<sup>3</sup>, and it will be noted that inasmuch as the ferrules alone come in contact with the metallic bands and at points directly opposite the wooden rings all strain upon the glass is removed. It will also be noted by reference to Fig. 3 that by having the tapering ferrules contact with the cylinder the roller and the curtain upon the roller is held a short distance away from the cylinder, thereby providing a V-shaped opening I, into which the end of the print can be readily slipped. In order, however, to prevent this opening when both of the rollers are brought together at the front of the machine, I provide a depression K in the face of the cylinder, into which the tapered ferrules can drop, as most clearly shown in Fig. 4, for the purpose of bringing the curtain firmly against the glass. Either or both rollers can be rolled or rotated completely about the cylinder, starting from the front central point, and at all times tension will be exerted to hold the curtain tight and also firmly against the glass. It is obvious that one roller can be rolled or revolved in either direction without disturbing the other one, and it will also be understood that wherever a roller is placed there it will remain until readjusted. In placing the tracing and sensitive paper for the purpose of making the prints either the roller can be moved about the cylinder or the cylinder can be turned, the effect being exactly the same in both instances. By means of an apparatus constructed as herein shown and described continuous blue-prints or a print of any indefinite length can be easily made. If at any time slack should occur either in the cable or curtain, the tension can be increased by giving the bolt a partial turn and said slack thereby immediately taken up.

In Fig. 16 I have shown the ferrules arranged at the opposite end of a rod or shaft which extends entirely through the roller, thereby preventing one ferrule traveling faster or moving farther than the other one, or, in other words, causing the ferrules to travel in unison. The rod is provided with a slip-joint, which enables the sections thereof to have the necessary longitudinal movements.

Having thus fully described my invention,

what I claim as new, and desire to secure by Letters Patent, is—

1. In a device of the kind described, the combination with a transparent surface, of a  
5 curtain adapted to rest against said surface, the rollers connected to the ends of said curtain, said rollers being movable in contact with the transparent surface, and adapted to hold the curtain in contact therewith.
2. The combination with a surface of a cur-  
10 tain adapted to rest against said surface, the rollers connected to the ends of said curtain and upon which the curtain is rolled, and means for holding the rollers and curtain in  
15 contact with the surface.
3. The combination with a glass cylinder of a curtain adapted to envelop the same, the rollers to which the ends of the curtain are attached and means for holding the said rollers  
20 in contact with the cylinder.
4. The combination with a glass cylinder, of a curtain capable of completely enveloping the said cylinder, the rollers to which the opposite ends of the curtain are connected, and means  
25 for holding the rollers in contact with the cylinder, said rollers being movable independent with each other and each capable of a complete revolution about the cylinder.
5. The combination with a cylinder, of a cur-  
30 tain adapted to envelop the same, the rollers to which the opposite ends of the curtain are connected, said rollers being adapted to revolve around the cylinder, means for holding said rollers to the cylinder together with means carried by the rollers for exerting a tension upon  
35 the curtain.
6. The combination with a transparent cyl-  
inder, of a curtain adapted to envelop the same, the rollers to which the ends of the curtain  
40 are connected, said rollers being adapted to revolve around the said cylinder, means for

holding the rollers to the cylinder and self-contained spring-actuated means carried by the rollers for exerting a tension upon the curtain.

7. The combination with a transparent cyl-  
45 inder of the curtain adapted to envelop the same, the rollers to which the opposite ends of the curtain are attached, the spring-actuated ferrules carried by the rollers, and the  
50 cable connected at its opposite ends to the spring-actuated ferrules and connected to the cylinder intermediate its ends.

8. The combination with a curtain of the rollers connected to the ends of said curtain  
55 and the cable having its opposite ends connected to the rollers.

9. The combination with the curtain of the rollers, the helically-grooved ferrules connect-  
60 ed to said rollers and the cable to the said ferrules.

10. The combination with the curtain of the rollers, the tapered helically-grooved ferrules connected to said rollers and the cable connect-  
65 ed to said ferrules.

11. The combination with the curtain of the rollers, the tapered helically-grooved spring-actuated ferrules connected to the rollers and the cable to the said ferrules.

12. The combination with the glass cylinder  
70 of the flanged metallic rings, the wooden rings, and the metallic bands, the curtain adapted to surround the cylinder, the rollers having tapered helically-grooved ferrules carried by the rollers and the cable connected at its ends to  
75 the ferrules and intermediate its ends to the cylinder.

JAMES H. WAGENHORST.

Witnesses:

CHAS. E. BROCK,  
M. D. BLONDEL.