No. 775,232. PATENTED NOV. 15, 1904.

H. A. BUCHHOLZ & E. J. G. RADEMACHER.

BLUE PRINT MACHINE.

APPLICATION FILED MAR. 22, 1904.

NO MODEL. 3 SHEETS—SHEET 1.

Fig. 1,

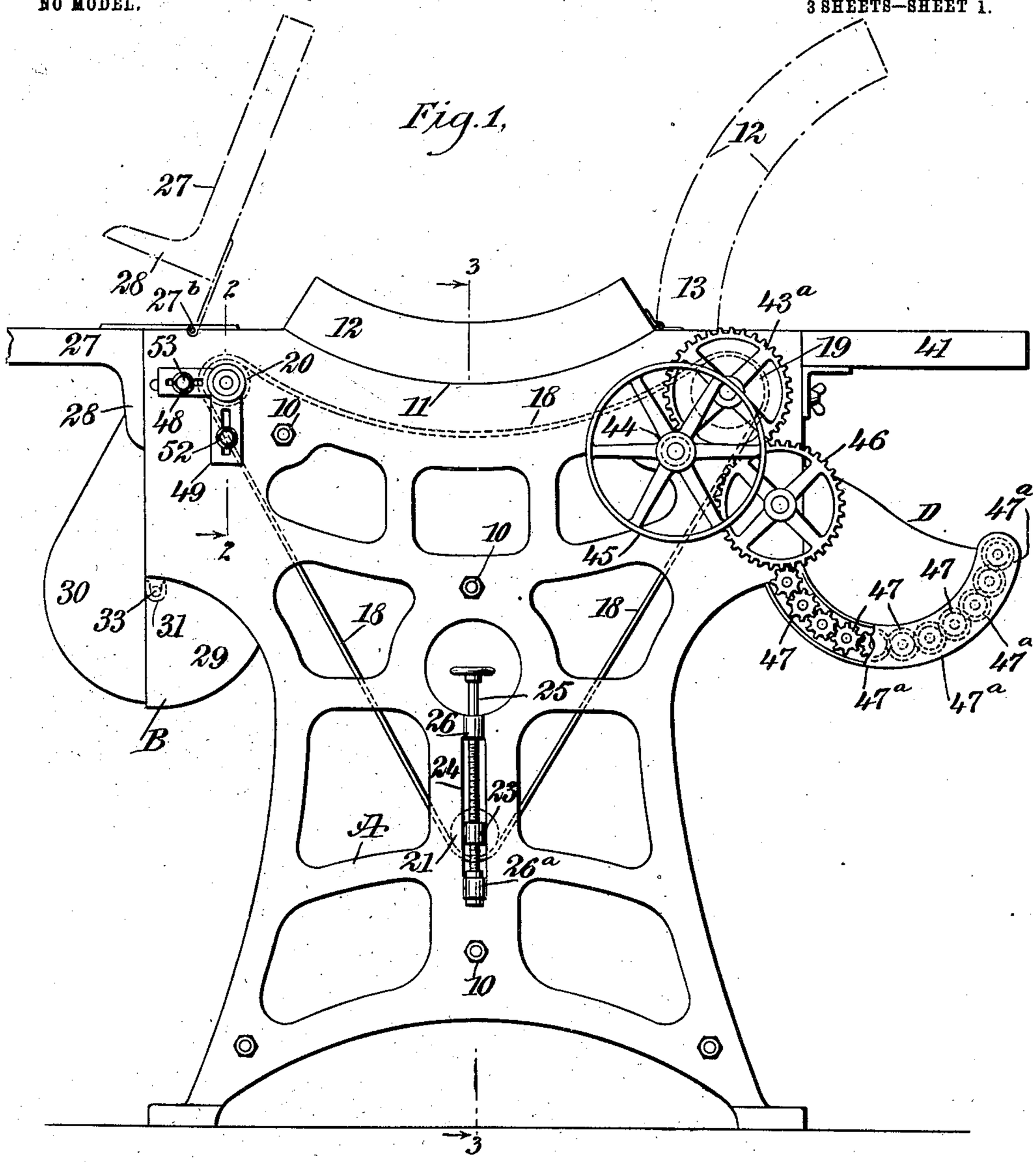
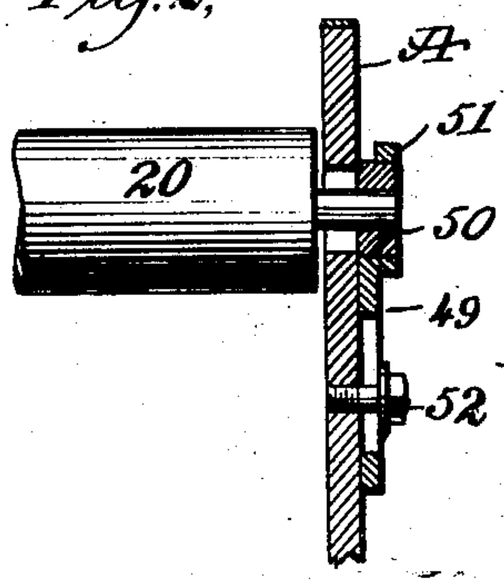


Fig. 2,



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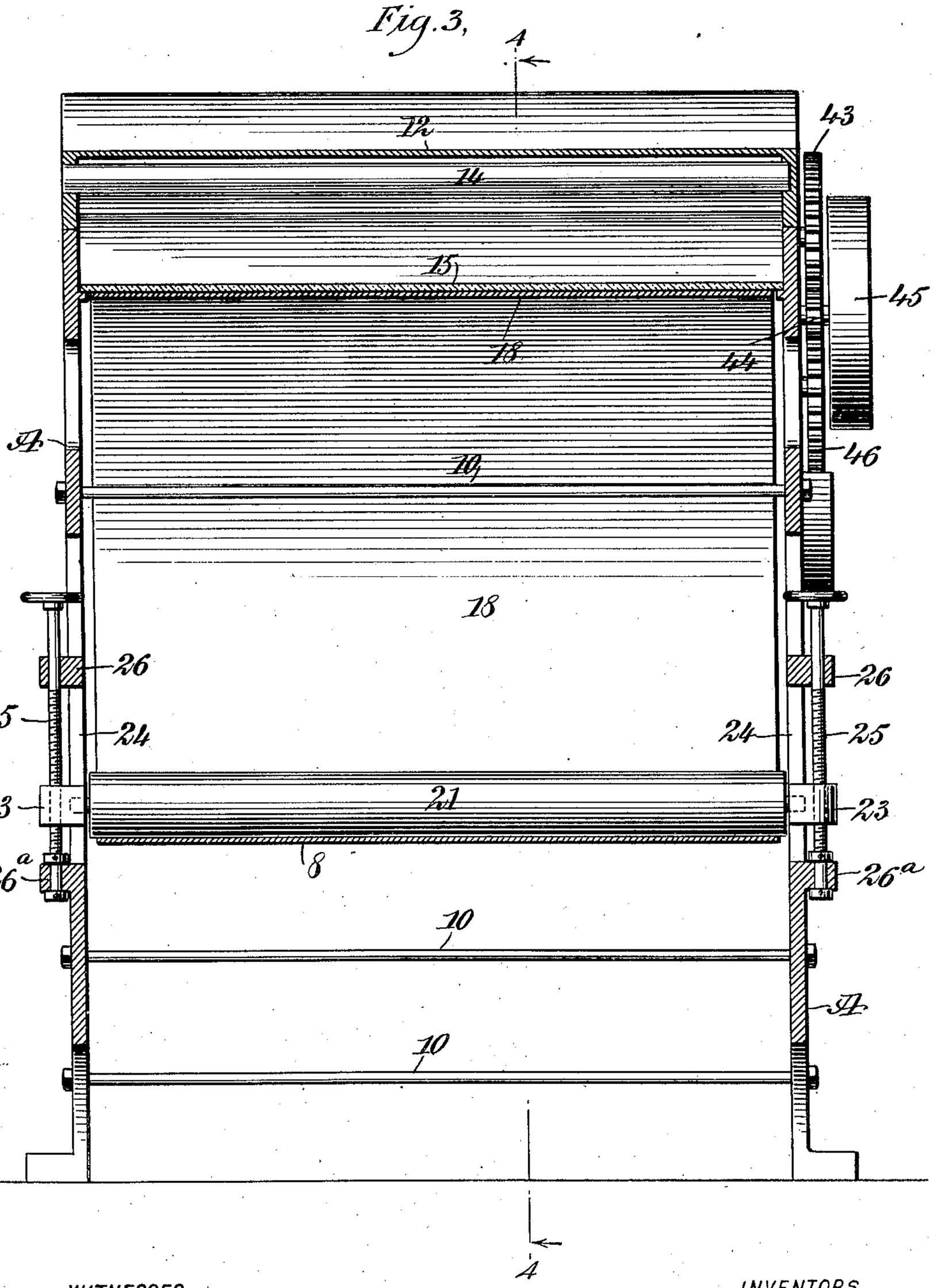
NO MODEL. 3 SHEETS—SHEET 2.

Fig. 3,



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NO MODEL. 3 SHEETS—SHEET 3.

Fig. 4.

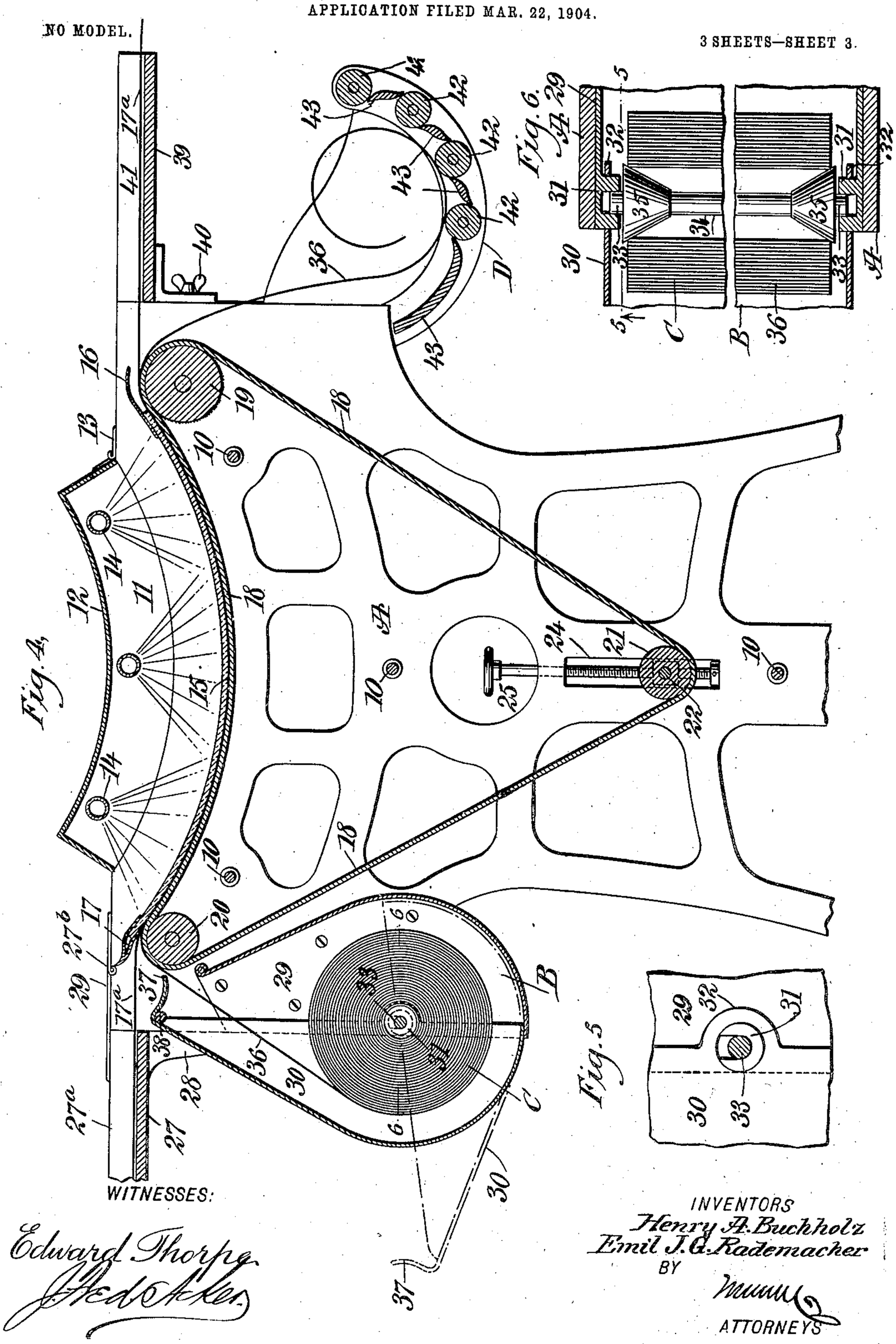

Fig. 5.

Fig. 6.

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No. 775,232. Patented November 15, 1904.

UNITED STATES PATENT OFFICE.

HENRY A. BUCHHOLZ AND EMIL J. G. RADEMACHER, OF NEW YORK, N. Y.

BLUE-PRINT MACHINE.

SPECIFICATION forming part of Letters Patent No. 775,232, dated November 15, 1904.

Application filed March 22, 1904. Serial No. 199,369. (No model.)

To all whom it may concern:

Be it known that we, HENRY A. BUCHHOLZ, a citizen of the United States, and EMIL J. G. RADEMACHER, a subject of the King of Denmark, both residing in the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Blue-Print Machine, of which the following is a full, clear, and exact description.

The purpose of our invention is to provide a simple form of machine especially adapted for making blue prints or photographic prints from tracings on transparent material or drawing-paper especially adapted for the purpose, and to so construct the machine that properly-prepared paper in the form of a reel is protected from the light and held in a revoluble manner in the machine in a suitable receptacle, and to provide means for feeding the prepared paper in connection with the tracing-cloth or other material from which a print is to be made beneath a transparent pane which will uniformly hold the sensitive paper and the tracing-cloth or other material containing the designs to be copied in smooth and close relation to each other.

Another purpose of the invention is to provide means for subjecting the transparent pane to a strong artificial light, together with means for protecting and curling the exposed portion of the sensitive paper after it has received an exposure.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the machine. Fig. 2 is a detail section taken practically on the line 2 2 of Fig. 1. Fig. 3 is a vertical section taken substantially on the line 3 3 of Fig. 1. Fig. 4 is a section taken at right angles to that shown in Fig. 3 and on the line 4 4 of said Fig. 3. Fig. 5 is a detail vertical section of the receptacle containing the reel of sensitized paper, which section is taken practically on the line 5 5 of Fig. 6; and Fig. 6 is a horizontal section through the reel of the sensitized paper and sundry of the parts carrying the same, the section being taken practically on the line 6 6 of Fig. 4.

The frame A of the machine is constructed, primarily, of two side pieces, which are connected by bolts 10 in any approved manner, and at the upper central portion of each side piece A a concaved surface 11 is formed, as is shown in Fig. 1, and above this concaved surface 11 of the frame a light-box 12 is located, fitted to the said surface and connected with the frame by means of hinges 13, so that the light-box may be lifted up from the frame to the dotted position shown in Fig. 1; but the said light-box may be so made as to be entirely independent of the frame.

The light-box 12 is provided with illuminating-tubes 14 and with incandescent lights or similar means for artificially supplying light to a transparent pane 15, which is suitably supported at the upper portion of the frame, having an upper concaved and a lower convexed surface, and this transparent pane 15 is provided at its delivery end with a shield 16, adapted to protect the said sensitized paper from the light, and at the opposite end of the said transparent pane another shield, 17, is located, which serves to protect the paper from the light before it is introduced beneath the transparent pane and likewise serves to guide the tracing 17^a or other material containing the design which is to be printed from.

A conveyer-belt 18 is made to pass at its upper stretch in close relation to the under or convexed surface of the transparent pane 15, and this conveyer-belt is passed over a roller 19 at the delivery end of the machine, and this roller 19 is preferably more or less roughened at its periphery, and the belt 18 likewise passes over a preferably smaller roller 20 at the receiving end of the machine or the receiving end of the transparent pane, as is shown in Fig. 4. The belt 18, which is preferably made of felt or other yielding yet clinging material, is made to pass over a lower roller 21, and the trunnions 22 of this lower roller 21 are mounted in boxes 23, mounted

to slide in openings 24, made in the sides of the frame. Guides 26 and 26ª are located, respectively, at the upper and lower portions of the openings 24, and adjusting-screws 25 are held to turn freely in the said guides 26 and 26ª, the adjusting-screws having threads thereon between those portions which are located in the guides 26 and 26ª, as is shown in Figs. 1 and 3, so that by turning these adjusting-screws 25, the bearings or boxes 23 for the lower roller 21 being threaded to correspond to the threads of the said screws, the aforesaid roller may be raised or lowered, so as to place the belt 18 under more or less tension.

The tracing 17ª or drawing from which the print is to be made is passed over a table 27 at the forward or receiving end of the machine. This table 27 is provided with feet 28, which when the table is in receiving position bear against the forward edge of the frame, as is shown by positive lines in Figs. 1 and 4, and the said table 27 is provided with side flanges 27ª and is connected with the body of the frame by means of a hinge 27ᵇ or its equivalent, so that this table may be raised up to the position shown by dotted lines in Fig. 1, enabling a casing B to be opened for the introduction or removal of a spool on which the sensitized paper C is reeled. This casing B is preferably pear-shaped, as is shown in Fig. 1, and is in two sections 29 and 30. These sections are pivotally connected, and pivotal relation between the sections 29 and 30 is obtained by forming circular sockets 31 at the inside portion of the section 29, as is shown in Figs. 5 and 6, which sockets are open at the top, and in forming eyes 32 in the opposing section 30 of the said casing C, adapted to turn around the bearings 31, as is also shown in Figs. 5 and 6. The bearings 31 receive the trunnions 33 of the spool 34, above referred to, and this spool has conical members 35 adjacent to each end, the wider portions of which members 35 face outward. When a spool 34 is constructed in this way and the sensitized paper adapted to receive the impression is wound on the spool, the inner coils of the paper bear against the conical members 35, and the tendency of the roll of paper on such a spool is to travel outward and not cramp against the spool, enabling the paper 36 to be freely drawn off from the spool and without a probability of the paper being torn, and as the paper leaves the spool 34 it is passed over the blanket conveyer or belt 18 at the top beneath the transparent pane 15, while at the same time the tracing 17ª or other material containing the design to be transferred to the sensitized paper is passed between said sensitized paper and the transparent pane 15, and the action of the blanket conveyer or belt 18, which is very slow, will carry the combined tracing and sensitized paper in close relation from one end of the transparent pane to the other, and the exposure will have been fully made when the material has reached the rear or delivery end of the said transparent pane, whereupon the tracing will pass over a rear table 39, also provided with side flanges 41, and this table is removably and adjustably secured to the rear portion of the frame of the machine by means of suitable brackets controlled by thumb-nuts 40 and bolts, as is shown in Fig. 4.

When a roll of sensitized paper 36 is to be placed in the receptacle B, the member or section 30 is dropped downward to the dotted position shown in Fig. 4, and when this dropped member is closed a lip 37 at the normal upper end of the said member or section 30 will be brought into engagement with a pin 38, and such engagement serves to hold the said section 30 in its closed position, and the lip 37, in conjunction with the forward shield 17 on the transparent pane 15, prevents the light from reaching the sensitized paper in the said receptacle B.

After the sensitized paper has been acted upon by the light in the light-box 12 and as the said paper passes over the feed-roll 19 the exposed portion of the paper 36 is received in a practically open receptacle D, which is preferably given a more or less segmental form, and the exposed portion of the sensitive paper is rolled up in its receiver D, as is indicated in Fig. 4, by locating a number of rollers 42 at the bottom portion of the said receiver, all of which rollers turn in the same direction, and between opposing rollers and the innermost roller and the frame of the machine suitable partitions 43 are located.

The blanket conveyer or belt 18 is operated, preferably, in the following manner: A gear-wheel 43ª is secured upon the outer end of the trunnion of the driving-roller 19 for the blanket conveyer 18, as is illustrated in Fig. 1, and this gear-wheel meshes with a pinion 44, which is connected with a driving-pulley 45, adapted to be connected with any suitable source of power. This driving-pulley 45 is mounted to turn on a short shaft extending outward from the frame of the machine, as is illustrated in Fig. 1. The gear-wheel 43ª meshes with a gear 46 of preferably corresponding diameter, and this gear 46 meshes with the innermost idle pinion 47 of a train of pinions which operate the rollers 42, carried by the receiver D for the exposed portion of the sensitive paper. The idle pinions 47 are in mesh with each other and are likewise in mesh with pinions 47ª of corresponding size secured to the outer trunnions of the rollers 42 at that side of the machine at which the driving mechanism is located.

It will thus be observed that under the construction above described a machine is provided by means of which blue prints or simi-

lar prints may be taken no matter what the character of the weather may be and that the machine is exceedingly simple and durable and is effective in operation. It is furthermore obvious that a tracing, no matter of what length it may be, can be passed uniformly in engagement with the sensitized paper beneath the rays of light and the sensitized paper delivered in its exposed condition to the receiver D, and after the desired exposures have been made it is simply necessary to cut the sensitive paper as near as may be convenient to the feed-roller 19.

As the light-box is removable, convenient access may be gained at any time to the transparent pane, and the shields 16 and 17 at the ends of the transparent pane enable the tracing and the sensitized paper to be readily introduced between the blanket conveyer 18 and the said transparent pane and to find an unobstructed exit at the delivery portion of the two named parts.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. In a machine for duplicating drawings and designs, a stationary support, a conveyer for the material to receive the impression and the material from which the impression is to be made, a curved transparent panel secured to the support in fixed position, the said panel having its lower face convexed and against which the conveyer has tensional engagement, and means located above the transparent panel for supplying light to the same.

2. In a machine for duplicating drawings and designs, a support, a curved transparent pane secured to the support, and having its lower face convexed, an illuminating-box located over the said transparent panel, a conveyer operating relative to the convexed face of the transparent panel, the said conveyer being adapted to receive a sensitized strip, and a strip from which a duplicate is to be made, and convey the same beneath the said transparent panel, as set forth.

3. In a machine for duplicating drawings and designs, a supporting-frame having side pieces each provided with a concaved surface at its upper central portion, a curved transparent panel secured to the said supporting-frame and located between the side pieces, a curved box adapted to contain illuminators, located above the said transparent panel and fitted to the said concaved surface of the side pieces of the frame, a conveyer-belt adapted to have one of its stretches conform to and in close relation with the said transparent panel, roller-supports for the conveyer, and a driving mechanism for the roller-supports, as described.

4. In a blue-print machine, a support, a transparent panel, secured to said support, a conveyer for the sensitized paper operating in close relation to the transparent panel, a receptacle carried by the said support, a reel located in the said receptacle, and adapted to carry sensitized paper, the said receptacle being at the receiving end of the machine, and a receiver at the opposite end of the machine, adapted to receive the exposed portion of the paper, means for curling the material received in the receiver, an actuating device for the conveyer, actuating devices for the curling means for the receiver, operated by the actuating device for the conveyer, and means for illuminating the said transparent panel, as described.

5. In a blue-print machine, a frame, a concave transparent panel having shields at its ends and located in the frame, means for illuminating the upper portion of the transparent panel, a conveyer having a stretch conforming to the convexed portion of the transparent panel, roller-supports for the conveyer, a driving mechanism for one of the roller-supports, a receptacle for a sensitized paper, located at the receiving end of the machine, a take-up device located at the opposite end of the machine, and a driving mechanism for the said take-up device, actuated by the driving mechanism for the conveyer, as described.

6. In a blue-print machine, a receiver for the exposed material, rollers carried by the receiver and adapted to operate in the same direction on the material in the receiver, to curl said material, as described.

7. In a blue-print machine, a frame, a curved transparent panel having its upper face concaved and its lower face convexed, and a conveyer operating in connection with and in close proximity to the convexed surface of said transparent panel, supporting devices for the conveyer, a driving device for one of the supporting devices, and a box located over the concaved face of the said transparent panel, which box contains illuminating objects, as described, the rays from which objects are directed to said panel, as set forth.

8. In a blue-print machine, a receptacle in two sections, pivotally connected, a latch device for one of said sections, means for holding the other section to a support, bearings constituting pivotal connections between the sections, and a spool having its ends mounted in the said bearings, which spool is provided with conical end sections, the wider portions of which conical sections face outward, as described.

9. In a blue-print machine, a supporting-frame, a concave transparent panel having shields at its ends and located in the frame, means for illuminating the upper portion of the transparent panel, a conveyer having a stretch conforming to the convexed face of the transparent panel, means for driving the conveyer, a receptacle for sensitized material located at the receiving end of the machine, a

table at the receiving end of the machine located above the said receptacle, a receptacle for the exposed sensitized material at the delivery end of the machine, and a table located above said receptacle, for the purpose set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

HENRY A. BUCHHOLZ.
EMIL J. G. RADEMACHER.

Witnesses:
J. FRED. ACKER,
JNO. M. RITTER.