

No. 846,941.

PATENTED MAR. 12, 1907.

C. F. PEASE.

CONTINUOUS BLUE PRINTING, WASHING, AND DRYING APPARATUS.

APPLICATION FILED MAR. 15, 1906.

5 SHEETS—SHEET 1.

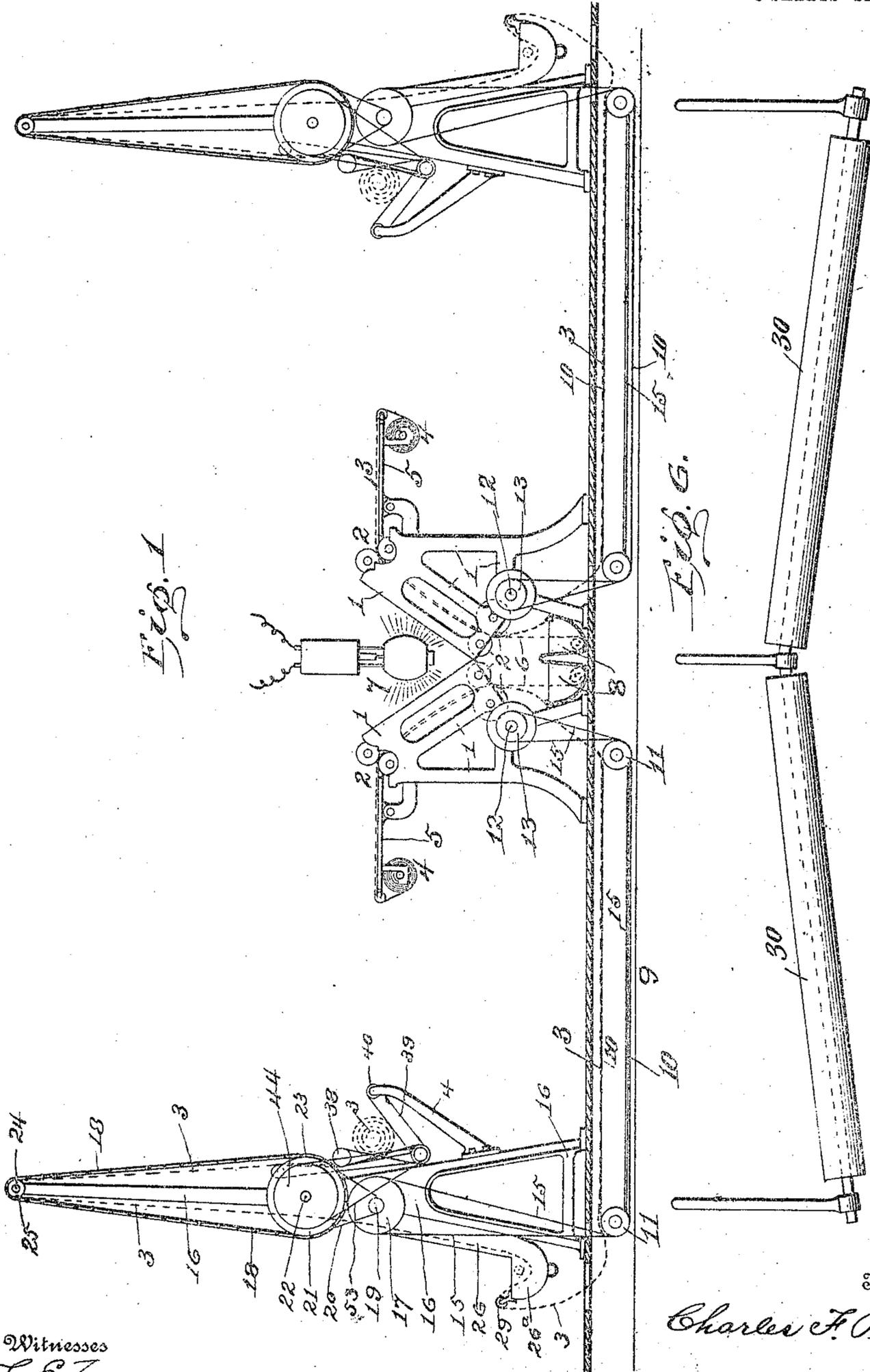


Fig. 1

Fig. 6

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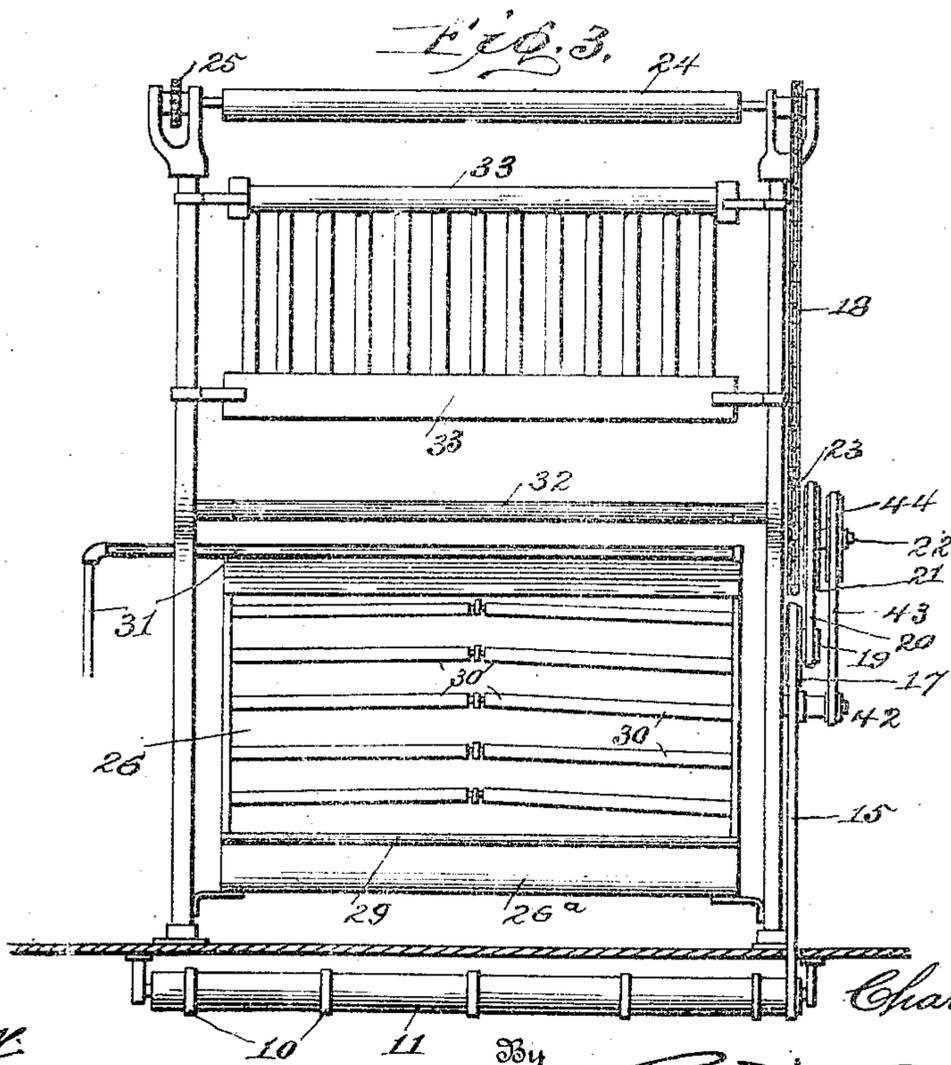
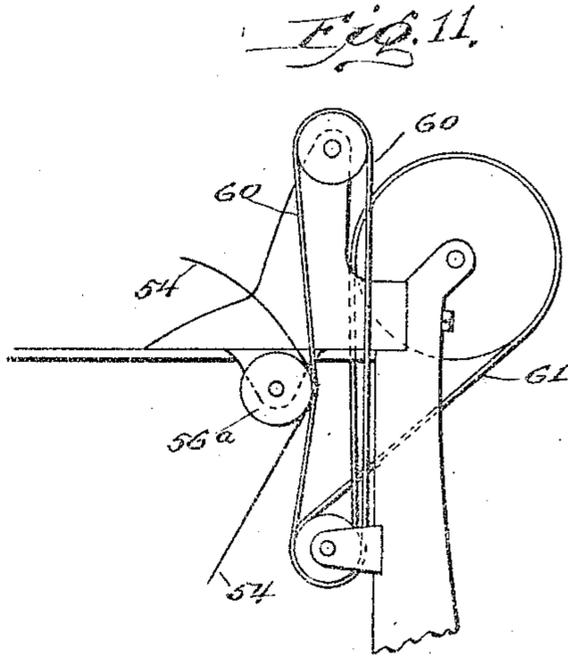
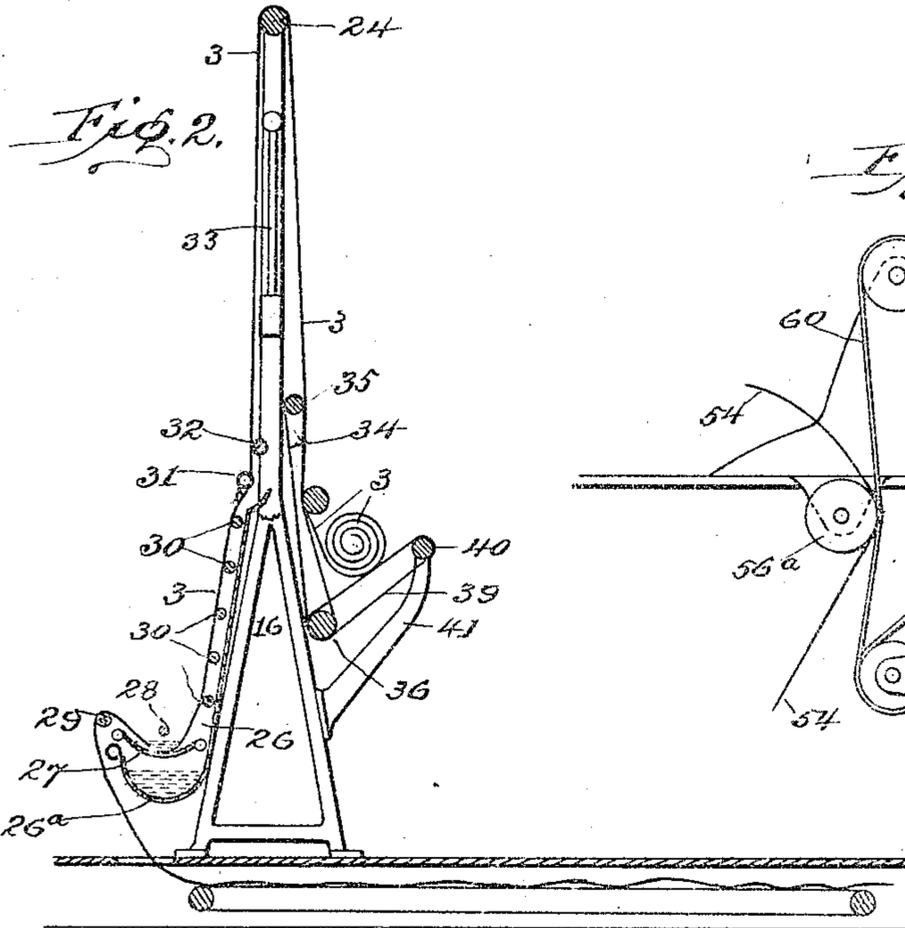
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5 SHEETS—SHEET 2.



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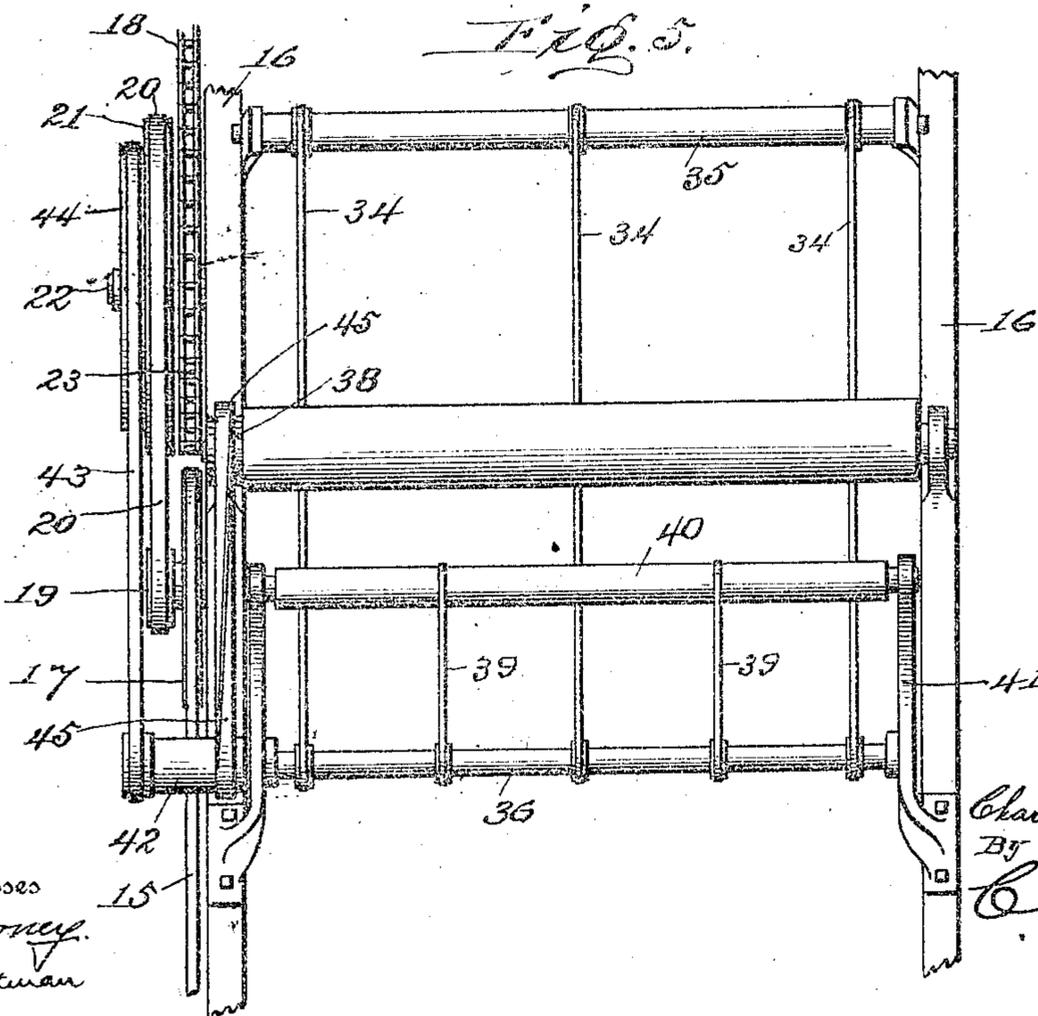
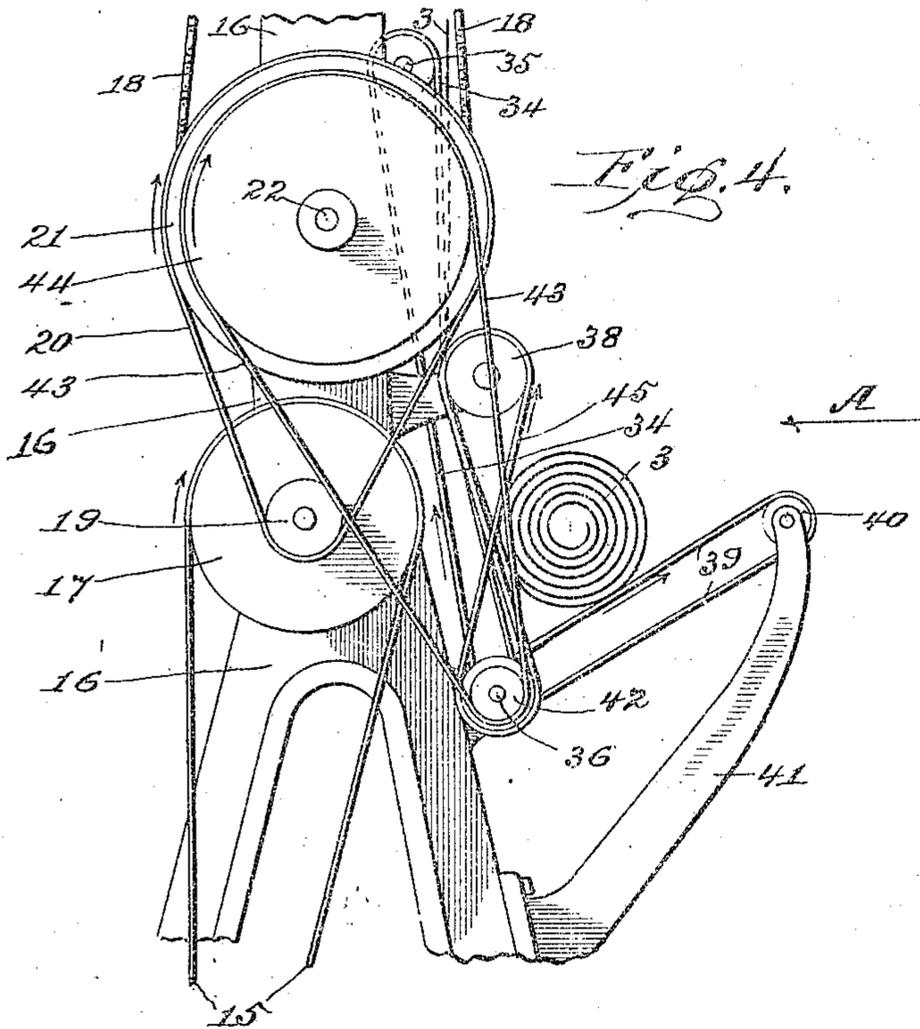
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5 SHEETS—SHEET 3.



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CONTINUOUS BLUE PRINTING, WASHING, AND DRYING APPARATUS.

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5 SHEETS—SHEET 4.

Fig. 7. x

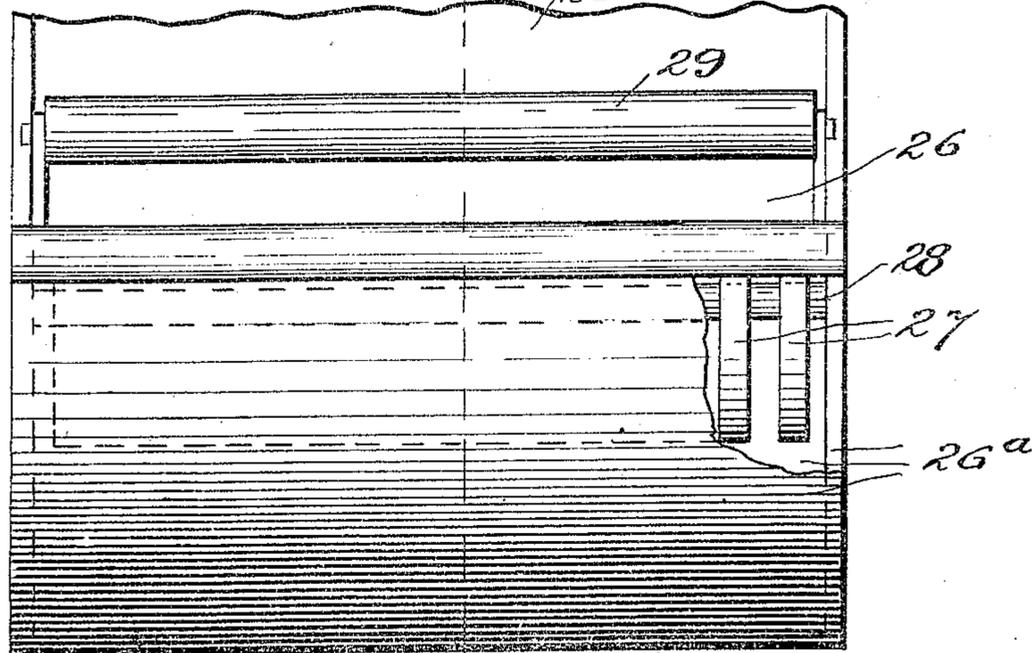


Fig. 8.

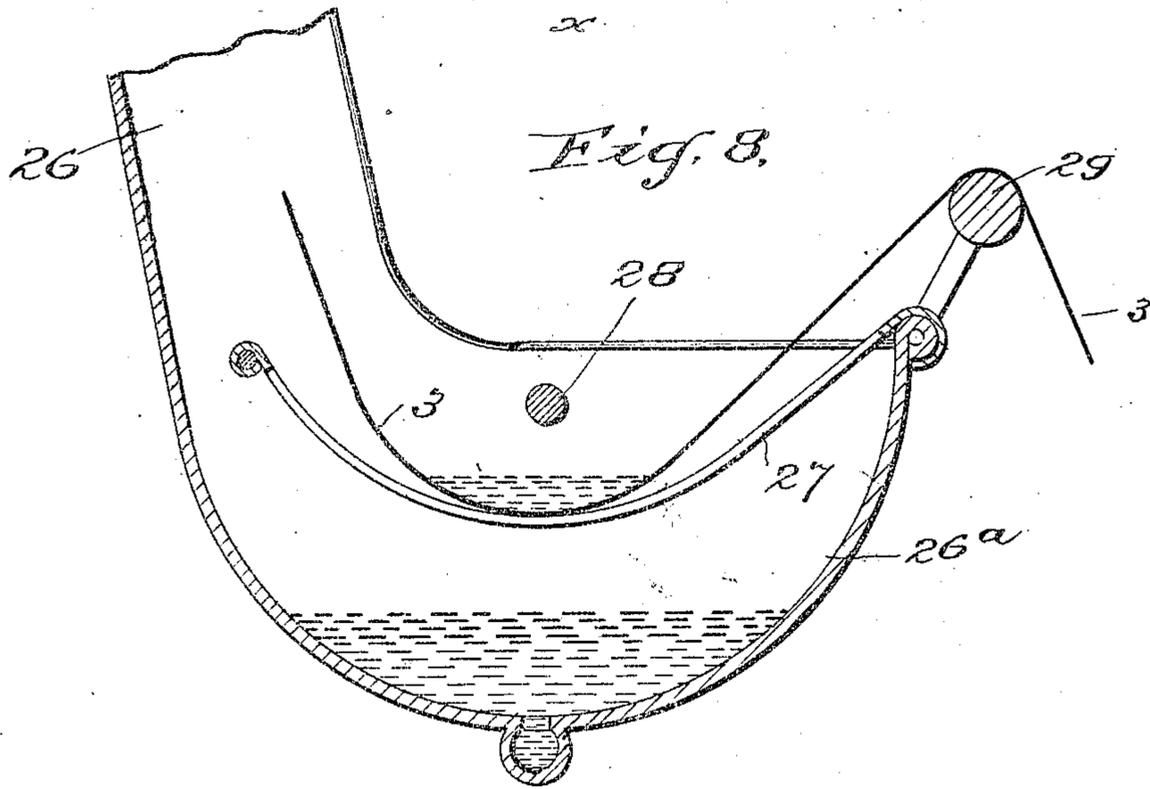
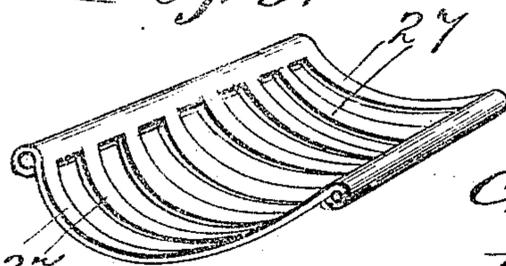


Fig. 9.



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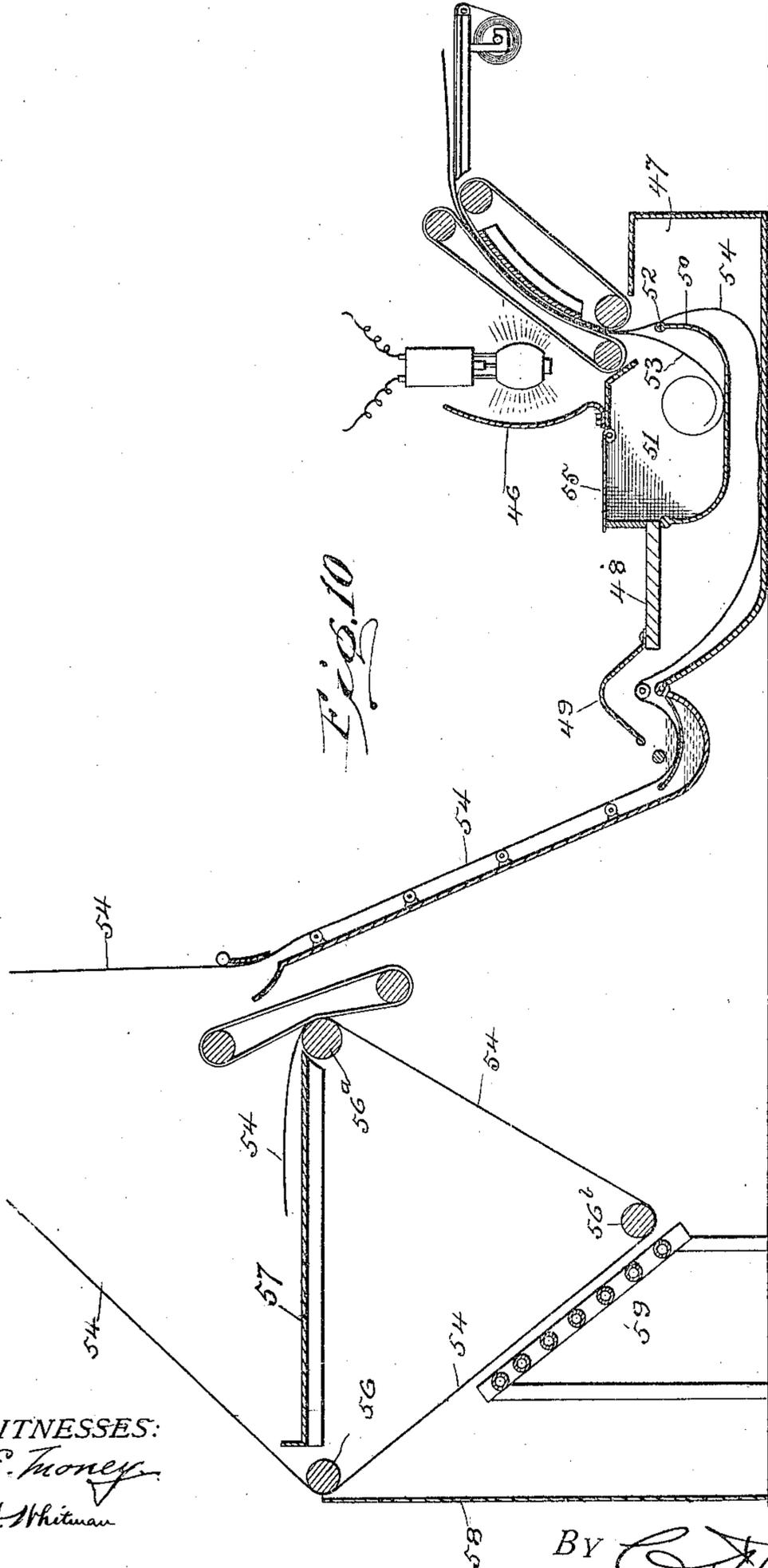
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CONTINUOUS BLUE PRINTING, WASHING, AND DRYING APPARATUS.

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5 SHEETS—SHEET 5.



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# UNITED STATES PATENT OFFICE.

CHARLES F. PEASE, OF CHICAGO, ILLINOIS.

## CONTINUOUS BLUE-PRINTING, WASHING, AND DRYING APPARATUS.

No. 846,941.

Specification of Letters Patent.

Patented March 12, 1907.

Application filed March 15, 1906. Serial No. 306,198.

*To all whom it may concern:*

Be it known that I, CHARLES F. PEASE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Continuous Blue-Printing, Washing, and Drying Apparatus, of which the following is a specification.

This invention relates to printing and developing blue-prints, and pertains especially to an apparatus for printing, washing, and drying prints upon a continuous sheet or length of traveling paper.

The subject-matter of this application is shown and described in connection with certain features covered by my Patents No. 786,596 and No. 797,910.

In the production of blue-prints upon a continuous traveling sheet either from separate short sheets of tracing or from continuous tracings it is highly essential to the avoidance of loss in sensitized surface, waste of material, stoppage of the traveling sheet, and the manipulation of the tracing and said sheet through the printer, as well as the disposition of the sheet for drying and the final disposition of the completed prints, that said operations be automatic and made to occur simultaneously and without interruption.

It is therefore the purpose of this invention to provide for the printing, washing, and drying of continuous sheets of blue-print or other sensitized paper during the movement of the paper its entire length or any part thereof.

The object of the invention is to provide an apparatus for automatically printing, washing, drying, and rerolling blue-prints in a continuous traveling sheet or length of sensitized paper while the latter is in motion.

A further object of the invention is to provide a pair of washing and drying machines operated in connection with a printer for blue-printing separate and independent blue-print sheets or continuous lengths of sensitized paper while traveling in opposite directions by one and the same electric or other suitable light.

The object, still further, of the invention is to provide in a blue-printing, washing, and drying apparatus a special device for rerolling the paper after the prints have been made or fixed and the paper dried and to arrange such connections and power transmission between the printer, the washer, and the rerolling device as to produce automatic operation

of the whole apparatus during the entire length of the sensitized paper being operated upon.

In the accompanying drawings, forming part of this application, Figure 1 is a side elevation, partly in section, showing a double apparatus constructed in accordance with this invention. Fig. 2 is a sectional view showing course of paper through the washer and drier. Fig. 3 is a front elevation of the washer and drier. Fig. 4 is a detail side elevation of the rerolling device. Fig. 5 is an elevation of the rerolling device looking in the direction indicated by the arrow A. Fig. 6 is a detail elevation of a pair of tray-rollers. Fig. 7 is a front elevation of the tray-basin, partly broken away. Fig. 8 is a section on the line  $x x$ , Fig. 7, with paper therein. Fig. 9 is a perspective view of the rack. Fig. 10 is a sectional view of part of an apparatus, showing a modification. Fig. 11 is a detail side elevation of certain driving pulleys and belts used in connection with the apparatus shown in Fig. 7.

The same reference-numerals denote the same parts throughout the several views of the drawings.

The printer forms no part of my invention and may be single or double, as desired, and when the latter is used the washer, drier, and rerolling device are duplicated, as shown in Fig. 1 of the drawings. Therefore a single apparatus will be herein described.

The printing-frame 1 is suitably fixed to a floor and has two pairs of rollers 2, which feed the sensitized paper 3 from a roll 4 of said paper over a table 5, together with a tracing-sheet 6, through the path of an electric light 7, where the tracing is caught in a box 8, while the printing-paper is directed over the edge of the box and under the floor onto a carrier 9, composed of a series of endless tapes 10 and a pair of rollers 11. An endless apron or wide belt would answer the same purpose as the tapes, or the paper could be dragged from the printer to the washer in the absence of the carrier, the object of the latter being to support and carry all slack in the paper to a point under the washer without danger of tearing the paper, the carrier having slightly greater speed than the paper.

The frame 1 has a shaft 12, which operates the rollers 2 and is adapted to be driven by any suitable power, preferably an electric motor, (not shown,) and said shaft 12 has a

pulley 13, over which and the tape-rollers 11 an endless belt 15 is operated.

An upright frame 16 carries the washing, drying, and rerolling devices and has a pulley 17, driven by the endless belt 15. Motion is imparted to a sprocket-chain 18 by a small pulley 19 on the spindle of the pulley 17, which pulley 19 operates an endless belt 20, running over a pulley 21 on the main shaft 22, which has a sprocket-wheel 23 for the chain 18. The chain 18 operates a feed-roller 24, journaled in the top of the frame 16 and having a sprocket-wheel 25 for the chain 18.

The basin 26<sup>a</sup> of the washing-tray 26 is provided with a rack composed of metal strips 27, spaced apart nearly the width of the basin, so as to permit the water to drip over the edges of the paper between the sides of the rack and the sides of the basin into the latter. This rack is hung in the basin 26<sup>a</sup> under a roller 28. A roller 29 is placed over the front edge of the basin, and a series of rollers 30 are arranged end to end in the tray and at an angle lengthwise one to the other in pairs for the purpose of keeping the blueprint paper stretched smoothly crosswise. The roller 28 prevents the paper being lifted out of the basin, and the rack supports the paper in its first bath.

At the top of the tray 26 is a spray-pipe 31, under and against which the paper passes, and above this pipe is a roller 32, over and against which the paper travels. A gas, electric, or steam heater 33 is secured to and central of the upright frame 16 above the tray for drying out the prints as the paper passes without contact with the heater to the rerolling device.

The device for rerolling the paper consists of a series of vertically-disposed endless tapes 34, operated by upper and lower roller-shafts 35 and 36, respectively, a roller 38, interposed in the path of the tapes 34, and a series of endless tapes 39, which are operated over a roller 40, supported at an angle to the tapes 34 by a bracket 41, said tapes 39 being operated by the roller-shaft 36, which is provided with a sheave 42, driven by a belt 43 from a sheave 44 on the main shaft 22. The roller 38 is revolved by a cross-belt 45 from the roller-shaft 36. It is obvious that the rerolling of the paper may be reversed, if desired, by simply crossing the belt 37.

Referring to the modification shown in Fig. 10 of the drawings, a light-reflector 46 stands upon the top of a box 47, having a platform 48, provided with a guard or shield 49. The box 47 has a partition 50, forming a tracing-receptacle 51, and the top edge 52 of the partition 50 forms a separator for the tracing 53 and printing-paper 54. One end of the box 47 is attached to the washing-tray with the guard 49 overhanging the tray, and the paper is drawn from said point of separation

along the bottom of the box 47 to the tray. The receptacle 51 is provided with a hinged lid 55 to expedite removal of the tracings.

As further shown in Fig. 10, there are three triangularly-arranged rollers 56, 56<sup>a</sup>, and 56<sup>b</sup> in connection with a cutting-table 57, from which depends a casing 58, inclosing a suitable heater 59, which may be located within or, as shown, supported on the outside of the triangle from a floor adjacent the lower roller 56<sup>b</sup> of the said three rollers. The paper is drawn from the washing-tray over a roller, (similar to the feed-roller 24 of the preferred form of machine,) thence over the roller 56, then under the roller 56<sup>b</sup> by way of the heater without contact therewith, and over the roller 56<sup>a</sup> to the table 57, where the paper may be cut into such lengths as may be desired.

As shown in Fig. 11, two of the rollers 56 and 56<sup>b</sup> are free to be revolved by the paper as it passes over them, and the other or top inner roller 56<sup>a</sup> is revolved by the tapes 60, driven by a cross-belt 61 from the shaft of the machine.

In washing and drying the paper it is drawn by the roller 24, assisted by the rerolling device, from the printer over the roller 29, under the roller 28 without engaging it, where the flow of water from the spray-pipe depresses the paper against the strips 27, where it is prevented from being drawn up against the roller 28 by the weight of the water, and the paper receives its first water-bath. The paper is dragged over said strips against the rollers 30, then behind the spray-pipe, which makes a continuous flow of water only upon the printed side of the paper and wipes the surplus water from the paper as the latter leaves said pipe. Thence the paper travels past the roller 32, over the roller 24, and is dried out thoroughly by the heater without contact with the latter before it reaches the rerolling device. The direction of travel, as indicated by the arrows of the tapes of the rerolling device will effect rerolling of the paper.

It will be seen that the printing-paper is unrolled and fed with the tracing through the printer where the tracing and said paper are separated; that the paper is fed from the printer for washing and drying in a continuous strip or length which is rerolled with the prints, washed, dried, and finished.

It will be observed that the prints are washed by applying water only to one side of the paper, that the paper is dragged through an accumulation of water from the spray on the paper and as it passes therefrom is further washed and cleansed by the continuous flow of water thereon from the spray-pipe, that the spray-pipe wipes the paper of surplus water, so that the paper has only a dampened print-surface when it leaves the pipe, that while one portion of the paper

is being washed other portions of the paper are dried and rerolled, and that by this system the back or reverse side of the paper is prevented from becoming wet.

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

10 1. A machine for washing blue-prints in a continuous sheet or strip, comprising a suitable frame or stand, a feed-roller carried by the frame, a suitable pipe to furnish a spray-wash against one side of the sheet while the latter is in motion, and means for elevating the sheet to permit an accumulated water-bath on the paper in advance of the spray-wash.

20 2. A machine for washing blue-prints in a continuous sheet or strip, comprising a suitable frame or stand, a feed-roller carried by the frame, a suitable pipe to furnish a spray-wash against one side of the sheet while the latter is in motion, means for elevating the sheet to permit an accumulated water-bath on the paper in advance of the spray-wash, and a device to support the portion of the paper holding said water-bath.

30 3. A machine for washing and drying blue-prints in a continuous sheet or strip, comprising a suitable frame or stand, a feed-roller carried by the frame, a suitable pipe to furnish a spray-wash against one side of the sheet while the latter is in motion, means for elevating the sheet to permit an accumulated water-bath on the paper in advance of the spray-wash, and a heater to dry out the sheet during its passage to and from the said roller.

40 4. A machine for washing blue-prints in a continuous sheet of traveling paper, comprising a suitable frame, a roller to feed the paper through the machine, and a pipe discharging water against one side of the paper while the latter is drawn against said pipe to remove surplus water from the paper.

45 5. The combination with a machine for washing and drying blue-prints in continuous sheets of traveling paper, of a heater located adjacent the path of the paper and adapted

to permit the paper to travel from one side of the heater to the other side thereof without contact therewith. 50

6. In an apparatus for treating a continuous sheet of blue-prints, comprising a suitable frame, a water-tray hung from the frame and having a spray for washing the sheet, a series of rollers arranged in the tray end to end in pairs at an angle one to the other to stretch the wet paper crosswise, a feed-roller in the top of said frame, means for revolving the roller, the rerolling device carried by said frame, and means for operating it. 55 60

7. In an apparatus for washing blue-print sheets, the combination, with a washing-basin, of means to limit the sagging of the sheet under weight of its water-bath, comprising a rack located in the basin and adapted to support the sheet above the bottom of the basin. 65

8. In an apparatus for washing blue-print sheets, the combination, with a washing-basin, of a roller for elevating the sheet to permit an accumulation of water thereon, and a rack in the basin below the roller to support the sheet and its accumulated water. 70

9. In an apparatus for washing blue-print sheets, the combination, with a vertically-disposed tray, having suitable water-supply and a basin, the tray-rollers, the basin-roller under which the sheet passes, a support or rack in the basin and under the basin-roller for the sheet, and a roller adjacent the basin for elevating the sheet. 75 80

10. In an apparatus for washing blue-print sheets, the combination, with a washing-basin, of a roller over which the sheet passes to its first water-bath, a rack in the basin to limit the sagging of the sheet from said roller under the weight of said bath, and a roller above the rack to prevent displacement of the sheet. 85 90

In witness whereof I hereunto set my hand in the presence of two witnesses.

CHARLES F. PEASE.

Witnesses:

M. V. PEASE,  
KATHERINE CULLINAN.