C. DE LUKACSEVICS.

BLUE PRINTING MACHINE.

APPLICATION FILED JULY 5, 1907.

901,303.

Patented Oct. 13, 1908.

3 SHEETS—SHEET 1.

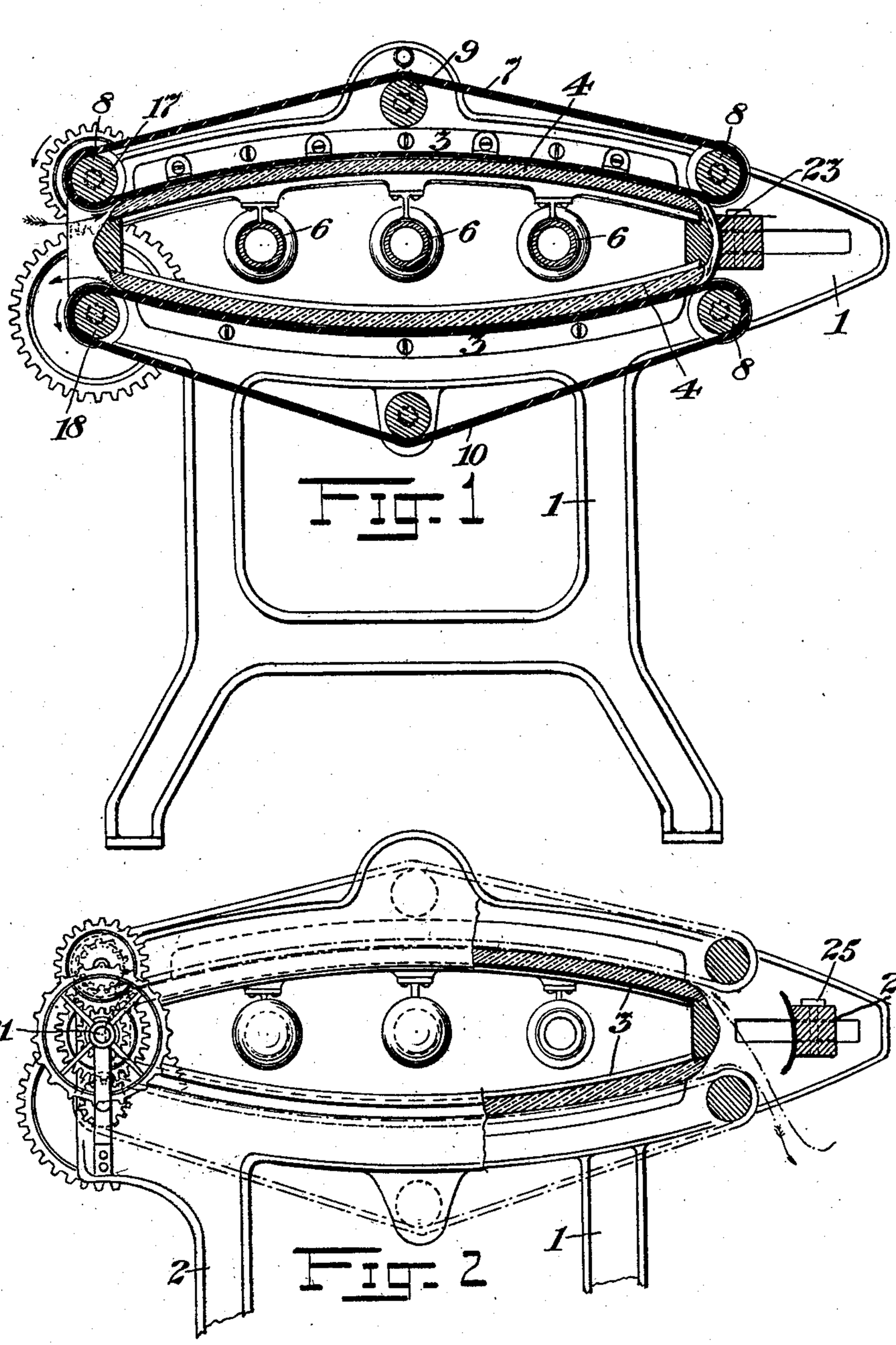

Fig. 1

Fig. 2

Witnesses

Thos. D. H. Brown

A. B. Woodward.

Charles de Lukacsevics -Inventor

By his Attorney

George H. Stockbridge

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3 SHEETS—SHEET 2.

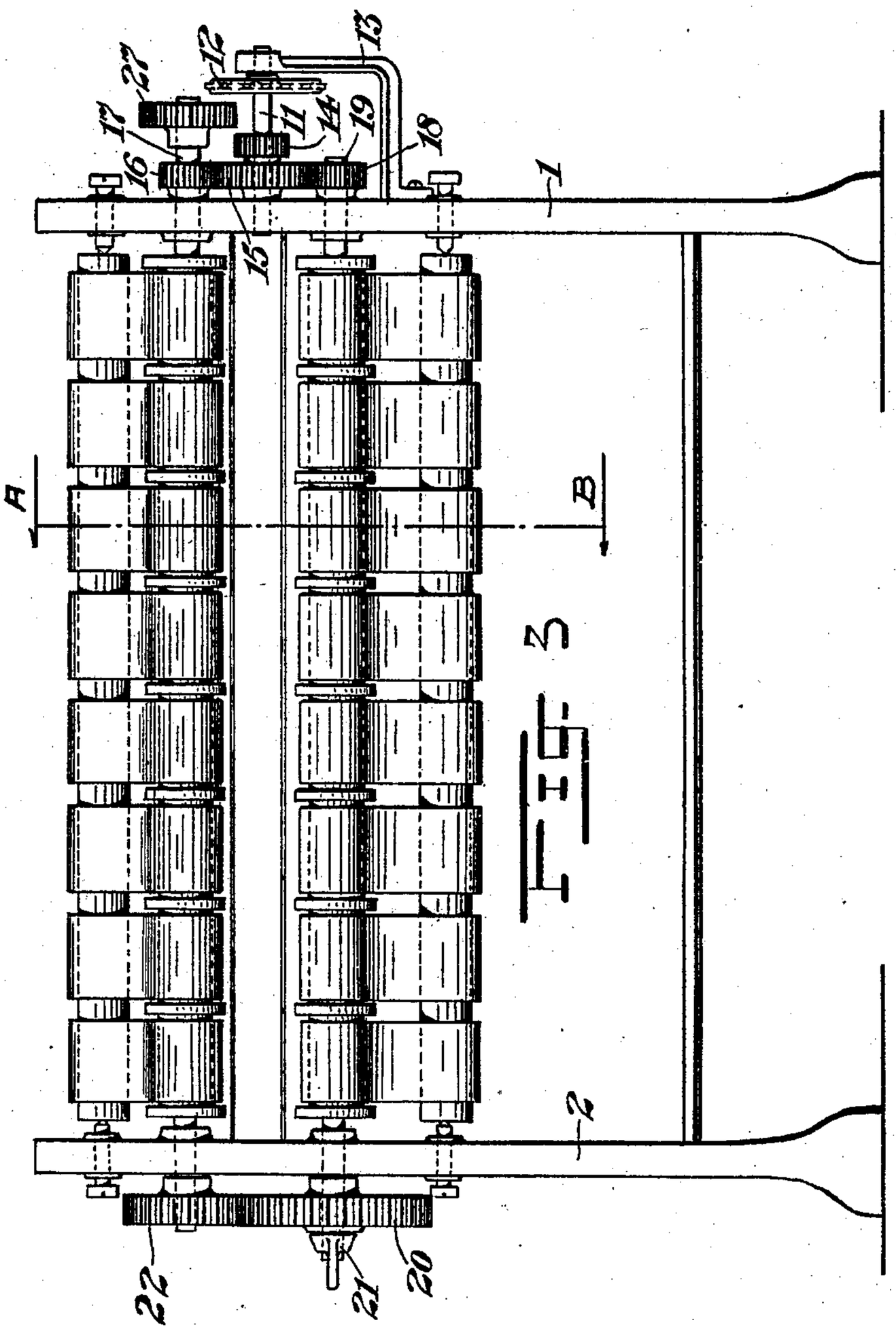

FIG. 3.

Witnesses
Thos. H. Brown
H. B. Woodward.

Inventor
Charles de Lukacsevics
By his Attorney
George H. Strong Jr.

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3 SHEETS—SHEET 3.

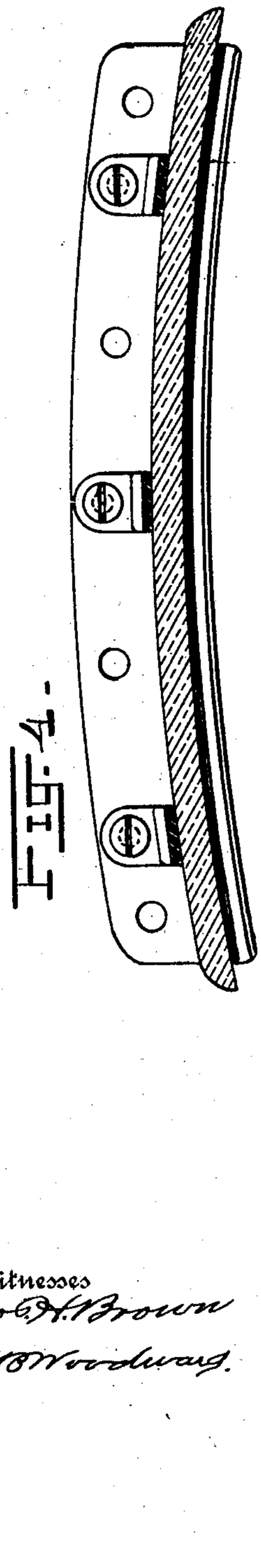

Fig. 4.

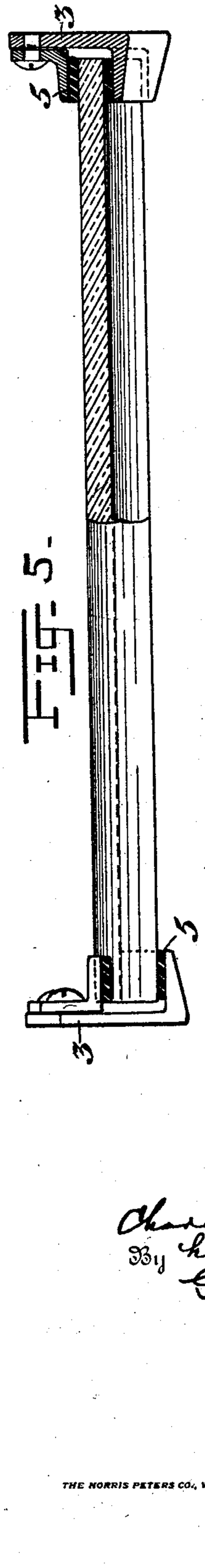

Fig. 5.

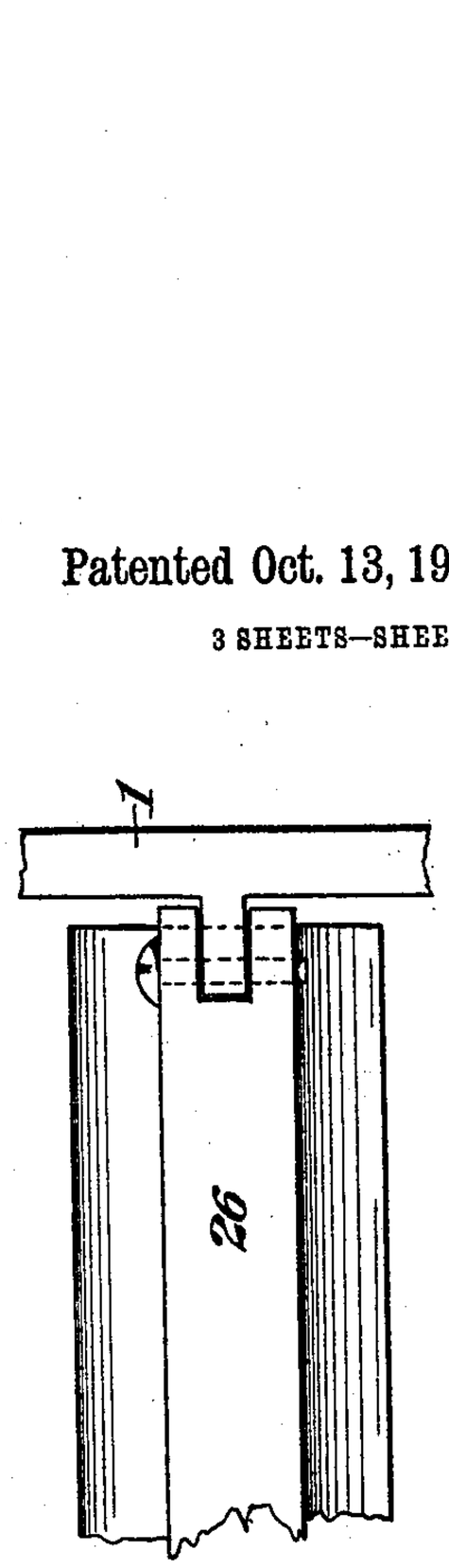

Fig. 6.

Witnesses

Thos. H. Brown

C. H. Woodward.

Inventor

Charles de Lukacsevics

By his Attorney

George H. Strobridge

UNITED STATES PATENT OFFICE.

CHARLES DE LUKACSEVICS, OF NEW YORK, N. Y.

BLUE-PRINTING MACHINE.

No. 901,303. Specification of Letters Patent. Patented Oct. 13, 1908.

Application filed July 5, 1907. Serial No. 382,169.

To all whom it may concern:

Be it known that I, CHARLES DE LUKACSEVICS, a citizen of the United States, and resident of New York, county of New York, 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 novel devices for making blue prints or similar reproductions of drawings, sketches, negatives, or the like.

For convenience, I shall hereinafter describe the sheets on which the reproductions are made as "printing sheets" and the drawings, sketches, negatives, or the like, which are reproduced as "transparencies". It will be understood that the transparencies may themselves be printed on paper or other material which is more or less thick, ranging from oiled paper to heavy cardboard, but no mistake will be made by referring to them as transparencies nevertheless.

The machine which I have invented is one in which the materials of the printing process, including the printing sheets and the transparencies, are moved along the surface of a transparent body behind which they are exposed to the light from one or more sources of illumination. By varying the speed, printing effects of various depths may be obtained, or the speed may be varied in order to compensate for different thicknesses or densities of the material of the transparencies. In order to print from oiled paper, for example, and from cardboard on the same machine, varying rates of speed will be necessary, as will be readily understood. I provide means for thus varying the speed and I also provide means whereby varying speeds may be obtained on different sides of the same apparatus, without changing or adding to the number of lights used as the source of illumination.

My invention is illustrated in the accompanying drawings, in which

Figure 1 is a transverse section along the line A—B in Fig. 3; Fig. 2 is an end elevation, partly sectional, of my machine; Fig. 3 is a side elevation, and Figs. 4, 5 and 6 illustrate details.

Referring to the drawings, the frame of my machine is shown at 1, 2. To the part 2 are secured clips, 3, 3, which are adapted to receive the ends of plates, 4, 4, preferably curved, of glass or other suitable transparent material. By referring to Fig. 5 it will be seen that the clips are separated from the glass on both the upper and under sides thereof by elastic cushions, 5, 5. These glass plates extend practically the whole length of the machine and face each other with an intervening space within which are supported lamps, 6, 6, preferably of the Cooper Hewitt type. The lamps may be suspended from the upper clips 3 as shown in Figs. 1 and 2. Above the upper plate 4 is arranged an apron, 7, or a series of aprons (see Fig. 3), the said aprons being adapted to pass over shafts or rollers, 8, 8, and an idler, 9. The apron will be arranged under tension over these rollers so as to form an endless apron. In a similar way an apron, 10, is mounted below the lower glass plate 4. Where the aprons pass, respectively, over and below the upper and the lower glass plates there is a space sufficient to admit printing sheets and transparencies which, however, are carried along by the movement of the apron along the faces of the stationary plates.

At one side of the machine is arranged a driving shaft, 11, carrying a driving wheel, 12, shown here as a sprocket wheel mounted in a bracket, 13. On the driving shaft 11 is a pinion, 14, and a larger pinion, 15, the said larger pinion engaging, in the position illustrated in Fig. 3, with a pinion, 16, on a shaft, 17, and also with a pinion, 18, on a shaft, 19. At the opposite end of the shaft 19 is a gear-wheel, 20, which may either rotate loosely upon the shaft 19 or by the operation of a thumb nut, 21, may be bound to the said shaft so as to rotate therewith. In other words, the thumb nut may be utilized to control the gear wheel 20 so that it shall either rotate with the shaft 19 or move loosely thereon. The gear wheel 20, engages with a gear wheel, 22, on the shaft 17.

At one side of the glass plates 4, 4 I may arrange a guide, 23, of celluloid or other material having a smooth surface, the same being bent into such form that materials for printing may pass by it in the direction of the arrows when the said materials are intended to pass the entire circuit including the path outside the exterior of both glass plates. It is possible, however, to move this guide away from the position shown in Fig. 1 and carry it into the position shown in Fig. 2. This is done by means of a rib, 24, on the frame of the machine, the said rib being provided with a vertical slot, (not shown) in which a rod or

screw, 25, passing through a lug or heel, 26, connected with the guide 23, is adapted to play or be moved. By taking hold of the lug or heel 26 and drawing it away from the sides of the plates 4, 4, the described change of position as between Figs. 1 and 2 can be accomplished. In this position, that is to say, in the position illustrated in Fig. 2, the connections of the gearing are different from those which appear in Fig. 3 and the apparatus is so geared up as to cause the aprons 7 and 10 to travel in the same direction outside the surface of the plates 4, 4, whereupon the materials for printing, instead of making the entire circuit already described, will pass out, as shown in Fig. 2 over one of the shafts or rollers 8 and drop into a suitable depository.

To accomplish the changed connection referred to, it is necessary, first, to move the shaft 11 so as to bring the pinion 14 into engagement with a gear wheel, 27, on the shaft 17. It is further necessary to operate the thumb nut 21 so as to tighten the gear wheel 20 on the shaft 19 whereupon the desired change of operation will have been accomplished.

In order that the action of the apparatus may be clearly understood I will now describe the operation thereof when a complete circuit is to be made by the materials to be printed; that is to say, when said materials do travel along the upper side of the upper plate 4 and along the under side of the lower plate 4, entering this circuit at a point appearing in Fig. 1 at the left hand side of the drawing underneath the apron 7 and over the upper plate 4 and taking their exit from the machine at a point immediately beneath the entering point and passing over the shaft 19 to a suitable place of deposit. Afterwards I will describe the operation of the device when the guide 23 has been pushed to the position shown in Fig. 2 and the gears have been shifted as indicated in the preceding paragraph.

For the first operation, the gearing connections are arranged as shown in Fig. 3 and the gear wheel 20 is left loose upon the shaft 19. If, now, the motive power be applied to the driving wheel 12 the shafts 17 and 19 will be rotated in the direction of the arrow (see Fig. 1) and the aprons 7 and 9 will be moved in opposite directions, one above and the other below the plates 4, 4. It will be remembered that for this operation the guide 23 is moved near to the sides of the plates 4, 4; that is to say, into the position shown in Fig. 1. If, now, the materials for printing are put in at the place of entrance already described they will travel towards the right in Fig. 1 over the surface of the upper plate 4, being subjected there to the effects of the light from the lamps 6, 6, 6, which are assumed to be operating and when they have traversed the entire upper surface of this plate they will be turned by the guide 23 down to the under side of the lower plate 4 and carried frictionally, as before, along the said under side and will be thrown out at the point of exit. This operation admits of rapid work, owing to the length of the surface of exposure caused by the adding together of the surfaces of the upper and lower plates. In this case the pinions 16 and 18 are of the same diameter and the speed of rotation of the shafts carrying the aprons 7 and 10 is therefore the same.

It will be understood that the gear wheel 20 during this operation rotates loosely upon the shaft 19 in a direction opposite to the movement of the said shaft and without affecting such movement.

For the second operation above referred to, the shaft 11 is moved so as to disconnect the gear wheel 15 from the pinions 16 and 18 and to bring the pinion 14 into engagement with the gear wheel 27. At the same time the thumb nut 21 is so operated as to tighten the gear wheel 20 upon the shaft 19. The shaft 17 now becomes the source of motion within the machine and by reason of the engagement of the gear wheel 22 on the said shaft with the gear wheel 20 on the shaft 19, the two shafts named will be rotated in opposite directions whereby it will happen that the apron 7 will pass over the upper plate 4 in the same direction as before, while the apron 10 will pass under the lower plate 4 in an opposite direction. Moreover, owing to the connection between the driving shaft 11 and the driven shaft 17 being made by means of a comparatively small pinion on the driving shaft and a larger gear wheel on the driven shaft, the speed of movement of the apron 7 will be cut down and in case the upper part of the apparatus is to be used for the same sort of printing as before, this speed may well be reduced by just one half, which will give to the prints exactly the same time of exposure as was given by the preceding operation. Again, inasmuch as the gear wheel 22 is small in comparison with the gear wheel 20, the speed of rotation of the shaft 19 may be still further reduced, thus adapting it for work requiring comparatively long exposure, such as brown printing or black printing. That is to say, the same machine may be used for different kinds of printing, one kind being carried on above the upper plate 4 and the other being carried on below the lower plate 4. The exit for the printing materials under these conditions is shown at the right in Fig. 2, it being understood that before the gears are shifted as described, the guide 23, will have been moved into the position shown in that figure.

I claim as my invention:—

1. In a blueprinting machine, a pair of transparent plates arranged opposite each other, a source of light between the said

plates, a pair of aprons, one coöperating with each plate for carrying the materials for printing across the surface thereof, and means for causing the aprons to travel in opposite directions across the plates to make a continuous circuit for the said materials and means for shifting the connection so as to cause the aprons to travel in the same direction across the plates.

2. In a blueprinting machine, a plurality of transparent plates, a plurality of aprons, one coöperating with each plate for carrying the materials for printing across the surface thereof, means for causing the aprons to travel in pairs in opposite directions across two opposite plates to make a continuous circuit for the said materials, and means for shifting the connections so as to cause the aprons to travel in the same direction across the surface of the plates.

3. In a blueprinting machine, a pair of transparent plates arranged opposite each other, a source of light between the said plates, a pair of aprons, one coöperating with each plate for carrying the materials for printing across the surface thereof, means for causing the aprons to travel in opposite directions across the plates to make a continuous circuit for the said materials, means for shifting the connection so as to cause the apron to travel in the same direction across the plates and means for interrupting the original continuous circuit and providing a new exit for the materials.

4. In a blueprinting machine, a pair of transparent plates arranged opposite each other and a common source of light for illuminating the said plates, in combination with aprons, one coöperating with each plate for carrying the materials for printing across the surface thereof, and devices operated by the same source of power whereby the aprons can be moved across the plates at the same or different speeds or velocities.

5. In a blue printing machine, a pair of illuminated, transparent surfaces, means for carrying materials for printing in a continuous circuit over both said surfaces, and means whereby, when desired, the said materials may be caused to leave the machine after having been carried over one of said surfaces only.

6. In a blue printing machine, illuminated, transparent surfaces, means for carrying materials for printing in a continuous circuit over said surfaces, and an adjustable guide which, in one position, forms a part of said circuit, and when in another position provides an exit for said materials after they have traversed a part, only, of said surfaces.

Signed at New York, in the county of New York, and State of New York, this 3rd day of July, A. D. 1907.

CHARLES DE LUKACSEVICS.

Witnesses:
THOS. H. BROWN,
GEORGE H. STOCKBRIDGE.