

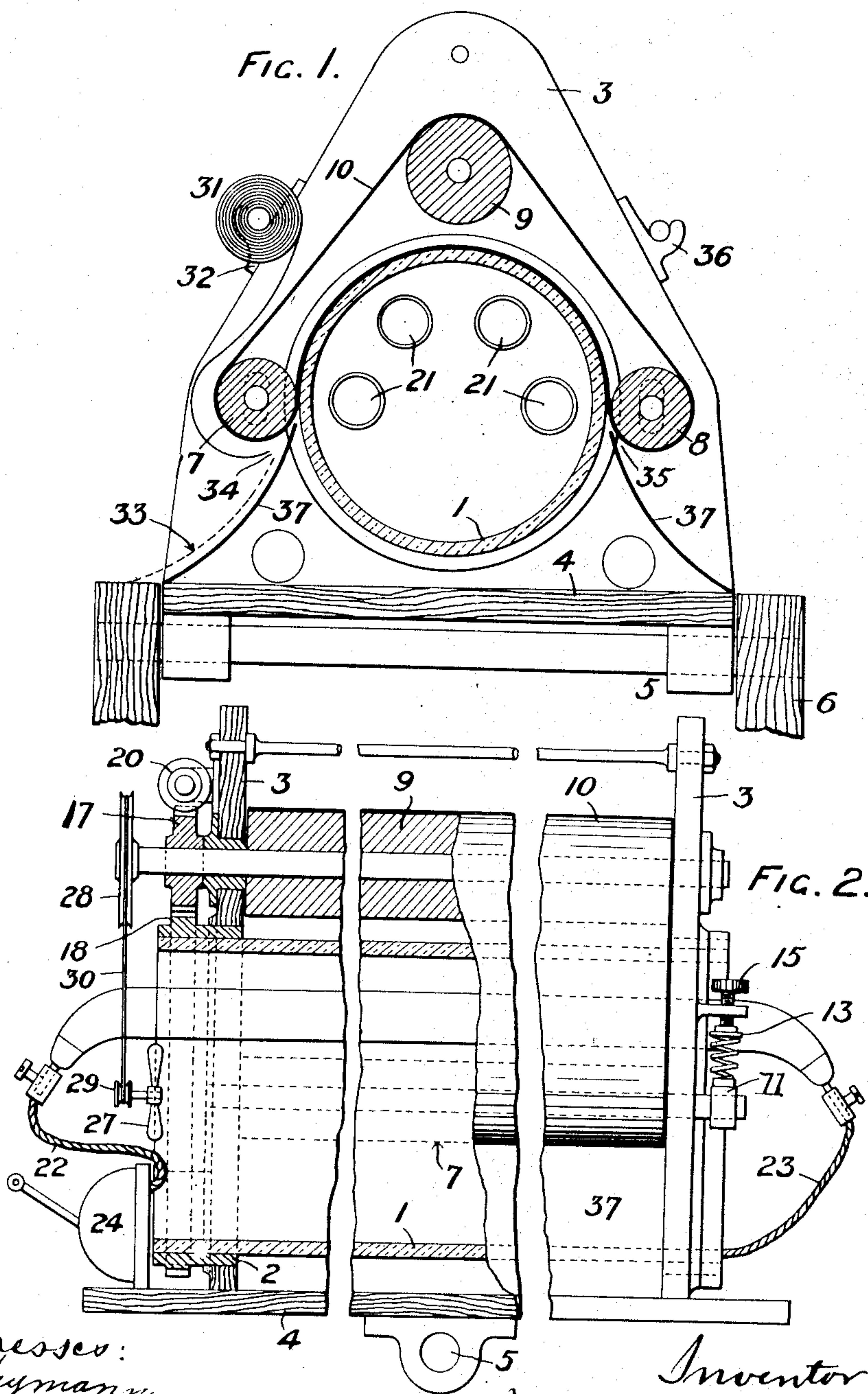
No. 884,056.

PATENTED APR. 7, 1908.

J. W. VICKERS.  
PHOTOGRAPHIC PRINTING APPARATUS.

APPLICATION FILED JULY 17, 1907.

2 SHEETS—SHEET 1.



Witnesses:  
C. Heymann  
L. Waldman

Inventor:  
James Warrick Vickers  
by B. Singer aty

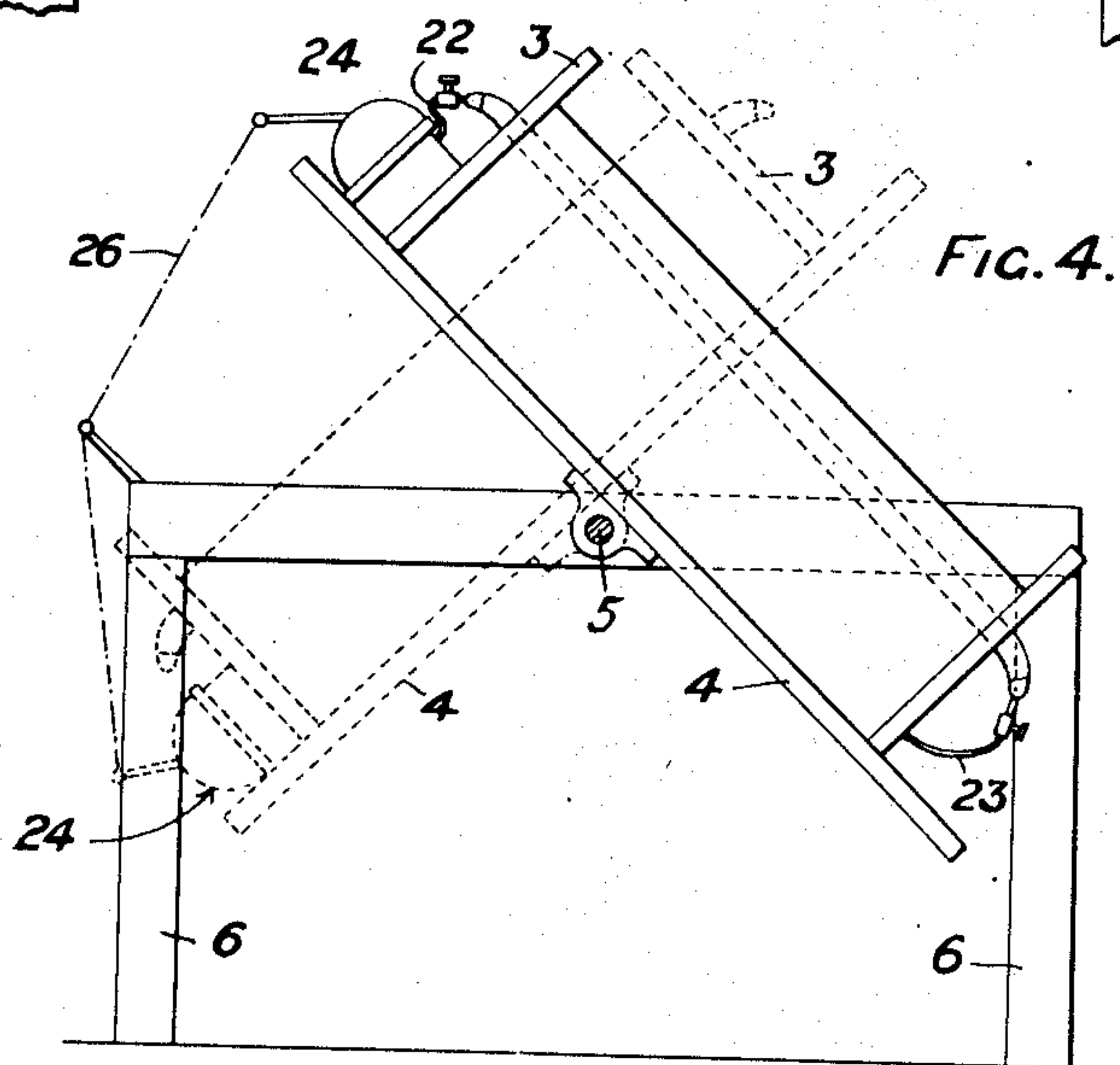
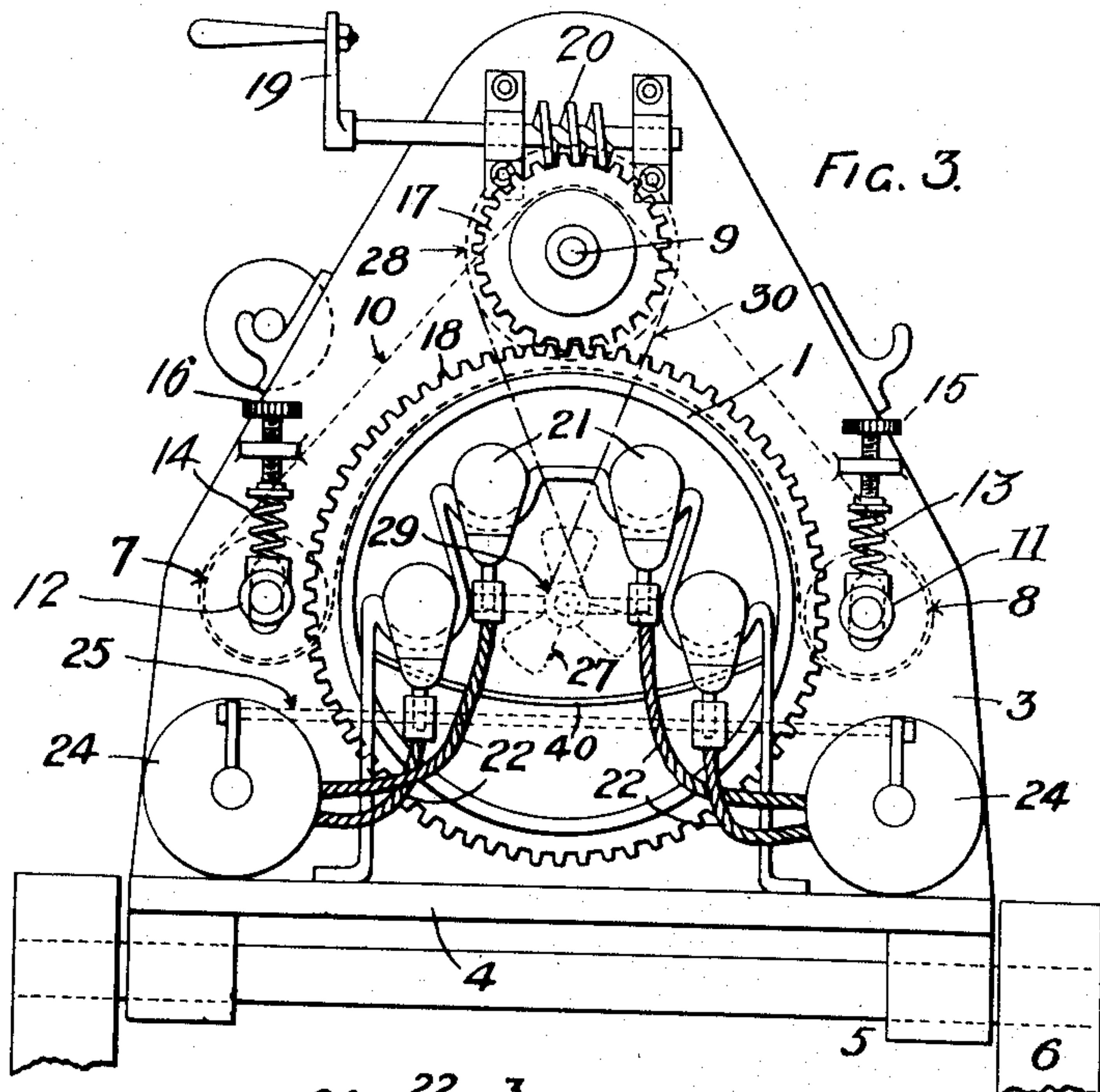
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# UNITED STATES PATENT OFFICE.

JAMES WARRY VICKERS, OF LONDON, ENGLAND.

## PHOTOGRAPHIC-PRINTING APPARATUS.

No. 884,056.

Specification of Letters Patent.

Patented April 7, 1908.

Application filed July 17, 1907. Serial No. 384,217.

*To all whom it may concern:*

Be it known that I, JAMES WARRY VICKERS, a subject of the King of Great Britain, residing at Finsbury Square Buildings, London, E. C., England, have invented certain new and useful Improvements in Photographic-Printing Apparatus, of which the following is a specification.

This invention relates to apparatus for use in the production of photographic prints by the ferro prussiate, ferro gallic or like processes from tracings etc., and its object is to simplify such apparatus and reduce the cost thereof, while at the same time the operation will be facilitated and improved results obtained.

A suitable form of apparatus for carrying my invention into effect is illustrated in the accompanying drawings, in which:—

Figure 1 is a transverse section thereof, Fig. 2 a side elevation partly in section and with parts broken away, Fig. 3 an end view, and Fig. 4 a side elevation drawn to a reduced scale, showing the apparatus mounted on a suitable stand, and illustrating the operation of the automatic switch hereinafter described.

In carrying out my invention I provide a hollow roller 1, which is formed of glass of a convenient length to suit the width of the paper to be used, such roller having rings 2 of metal or other suitable material secured around its ends and which fit into and are capable of revolving freely in circular recesses formed in the standards 3. The latter are firmly secured to a base plate 4, which for the purpose hereinafter described is movably mounted or, if desired, pivoted at 5 to the stand 6 on which the whole of the apparatus is supported. I also mount in bearings in the standards 3 a number of band rollers 7, 8, 9, the rollers 7 and 8 being arranged one on each side of and in close proximity to the glass roller 1, while roller 9 may as shown be disposed above and at a little distance therefrom. Around the rollers 7, 8 and 9 I arrange a continuous band 10 of cloth or other material so that it presses on about half the circumference of the glass roller 1, and for the purpose of keeping the same taut I preferably make the bearings 11, 12 of the rollers 7 and 8 capable of sliding in the standards 3 and provide springs 13, 14 (the tension of which can be adjusted by means of set screws 15, 16) to act on such

bearings and normally force same in the direction to tighten the band.

On the shaft of the roller 9 I mount a gear wheel 17 which engages with another wheel 18 arranged on the end of the glass roller 1, such wheel 18 being preferably as shown formed in one with one of the rings 2 secured to such glass roller. It will therefore be seen that when motion is imparted to the shaft of the roller 9, as for instance by means of the handle 19 and worm 20 acting on wheel 17, or by an electric or other suitable motor, such motion will be communicated to the endless band 10 and also to the glass roller 1, so that such band and the surface of the roller will be caused to travel in the same direction and at exactly the same speed.

Inside the glass roller 1, which is open at the ends, I mount a suitable number of electric mercury tubes 21, or other high power electric vacuum lights, same being arranged in close proximity to that part of the roller round which the endless band 10 passes. Such mercury tubes or the like are supported in any suitable manner, and the electrical connections 22, 23 are preferably arranged as shown when four of such tubes are employed, so that the two on each side are in series with each other and each pair is governed by a switch 24 or the like, which switches may be coupled together by a rod 25 (see Fig. 3). A reflector 40 is preferably arranged beneath the tubes to reflect back light that would otherwise be partly or completely lost.

When mercury tubes are employed it is necessary to cause the mercury to traverse such tubes from end to end, and for this purpose I mount the entire apparatus on the transverse pivots 5 so that it can be tipped to bring either end of such tubes uppermost. It is also important that the mercury should be at the positive pole when the current is turned on, and I therefore propose to employ the automatic arrangement shown in Fig. 4, consisting in the flexible connection 26 between the lever of the switch and a fixed point of the stand 6, and which is of such length as to actuate such lever to switch off the current when one end of the apparatus is lowered and switch it on when such end is raised.

If the tubes 21 become overheated their operation is interfered with, and to obviate this I propose to arrange a fan 27 adjacent to one end of the glass roller 1, and drive the



same by means of pulleys 28 and 29 and a belt 30 from the shaft of the roller 9, or in any other suitable manner, so as to create a current of air through roller 1 and thus keep the tubes 21 cool.

In operation a roll of ferro prussiate or like sensitized paper 31 is mounted in bearings 32 secured to the standards 3, and it and the tracing 33 to be copied are entered between the surfaces of the band 10 and the glass roller 1 at the point 34 with the face of the tracing in contact with the glass, and the apparatus is then rotated, causing such tracing and sensitized paper to be firmly gripped and drawn evenly and smoothly through the apparatus, there being no tendency for either to slip in relation to the other, as they are each independently acted on and caused to travel at exactly the same speed. As they pass the mercury tubes the light will effect the printing, the speed of rotation being calculated so as to give the correct exposure for the time occupied in passing such tubes, and the tracing and sensitized paper are passed out at the point 35, such sensitized paper being then if desired rewound on to a roll mounted in bearings 36, which may in this case be driven from roller 8 or in any other suitable manner.

Guides or shields 37 are arranged on each side of glass roller 1 below the points 34 and 35 to guide the tracing into and out of the apparatus, and at the same time prevent the light from acting on the sensitized paper before it and the tracing are firmly gripped by the endless band and glass roller.

What I claim as my invention, and desire to secure by Letters Patent, is:—

1. In a continuous photographic printing apparatus the combination of a revolving transparent roller, a plurality of band rollers disposed around said transparent roller and having an endless band passing over them, a base supporting said rollers and means connecting between said base and the main frame of the apparatus, and permitting movement of the frame with respect to the base substantially as specified.

2. In a continuous photographic printing apparatus the combination of a revolving glass roller, a plurality of band rollers disposed around said glass roller and having an

endless band passing over them, a gear wheel mounted on the glass roller and a pinion meshing with such gear wheel and mounted on one of the band rollers, means for communicating motion to such pinion, electric mercury vacuum tubes arranged in the interior of the glass roller, a base and a frame supporting the whole of these parts, and movably mounted to the base substantially as specified.

3. In a continuous photographic printing apparatus the combination of a revolving glass roller, a plurality of band rollers disposed around said glass roller and having an endless band passing over them, a gear wheel mounted on the glass roller and a pinion meshing with said gear wheel and mounted on one of said band rollers, means for communicating motion to said pinion, electric mercury vacuum tubes arranged in the interior of the glass roller, switches for controlling the supply of electric current to such tubes, a pivotal connection between the base plate on which these parts are mounted and the main frame of the apparatus, and automatic means operated by the tipping of the base plate on such pivotal connection for acting on the switches to control the supply of current to such tubes, substantially as specified.

4. In a continuous photographic printing apparatus the combination of a revolving glass roller, a plurality of band rollers disposed around said glass roller and having an endless band passing over them, a gear wheel mounted on the glass roller and a pinion meshing with such gear wheel and mounted on one of said band rollers, means for communicating motion to such pinion, electric mercury vacuum tubes arranged in the interior of the glass roller, a fan mounted at one end of the glass roller, means for actuating such fan, a base, and a pivotal connection uniting said base and the main frame of the apparatus, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES WARRY VICKERS.

Witnesses:

JOSEPH JACKSON,  
HORACE WEBB.