

No. 767,320.

PATENTED AUG. 9, 1904.

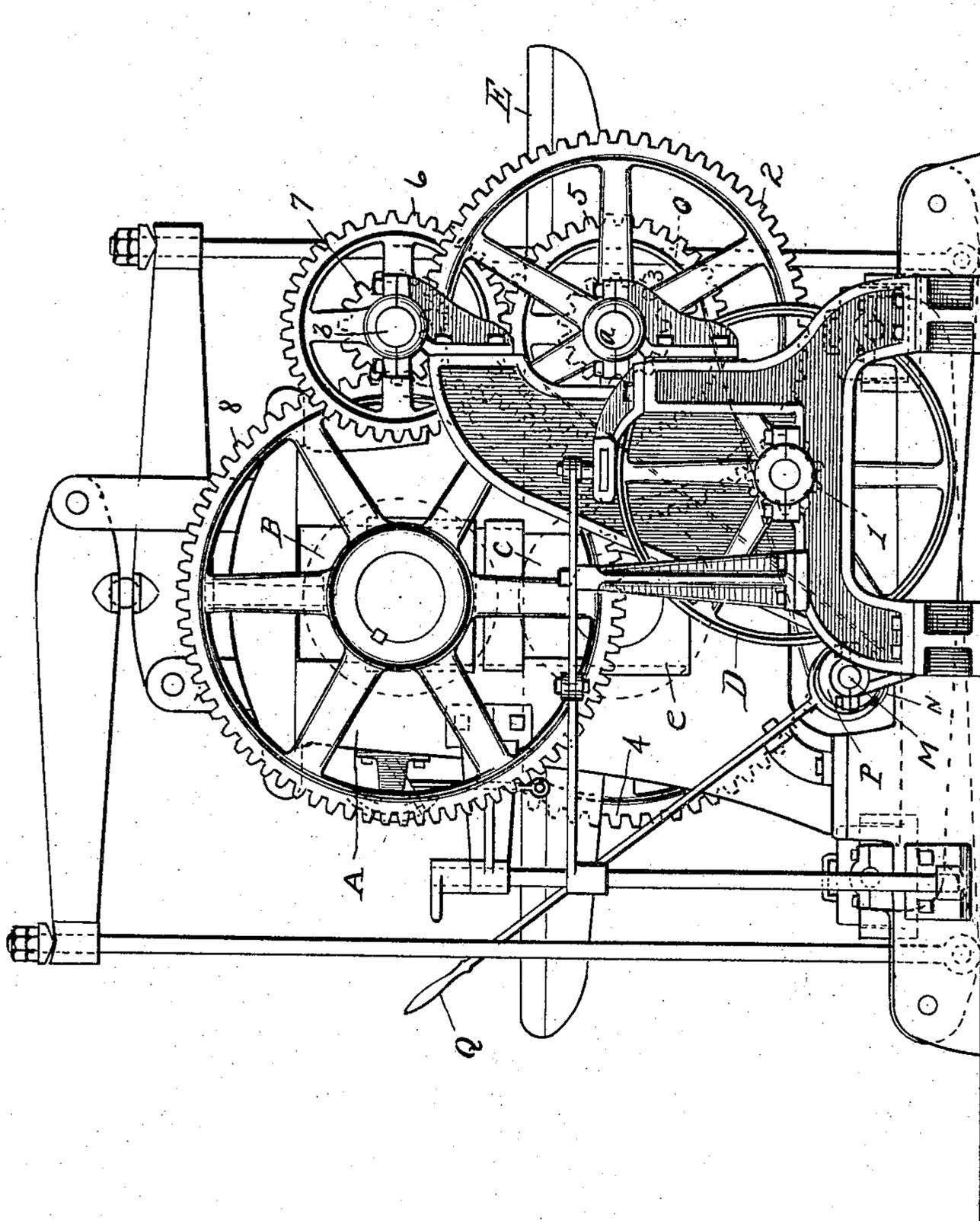
C. E. TORRANCE.
PAPER FINISHING MACHINE.

APPLICATION FILED AUG. 27, 1902.

NO MODEL.

5 SHEETS—SHEET 1.

Fig. 1.



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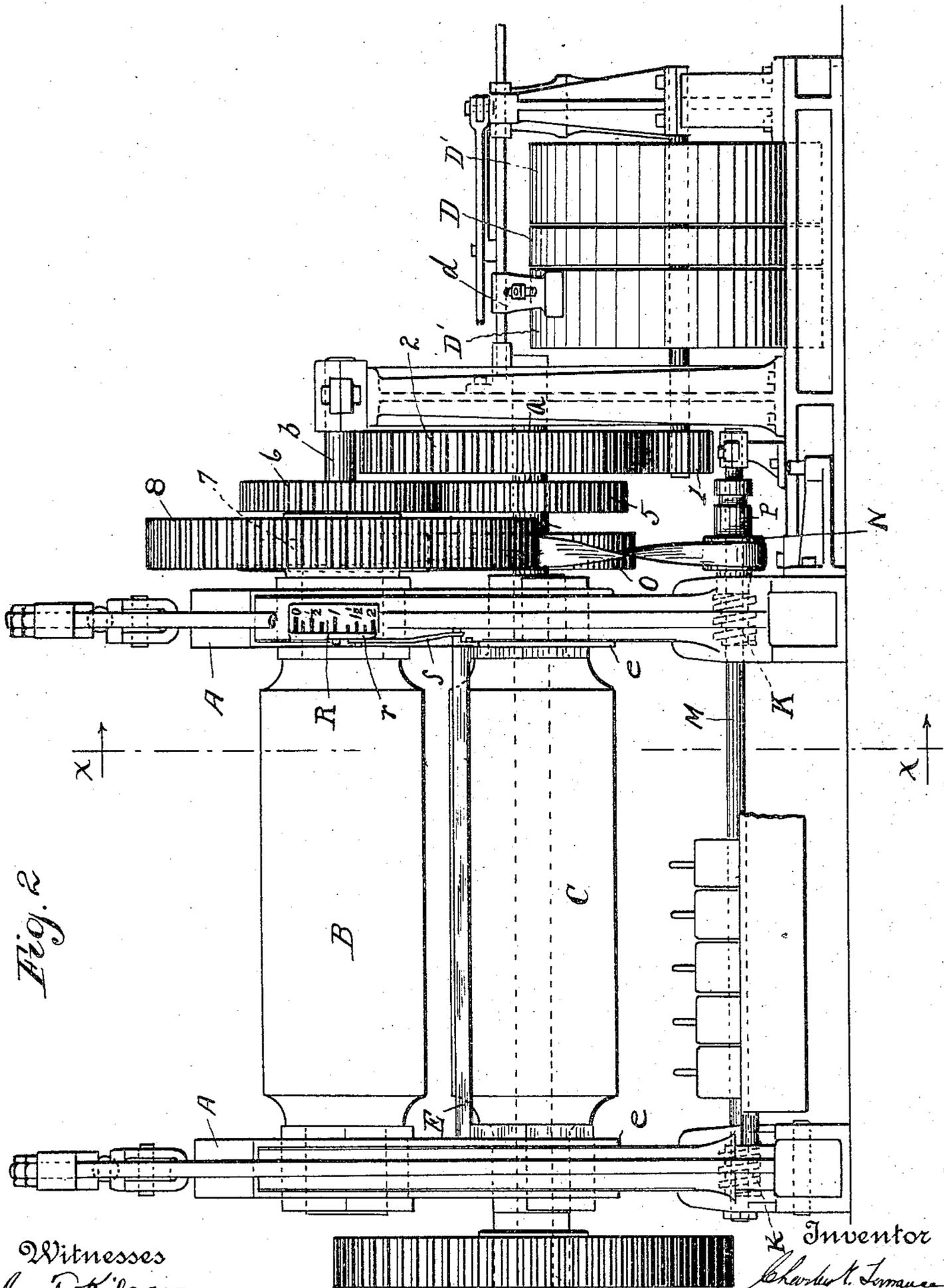


Fig. 2

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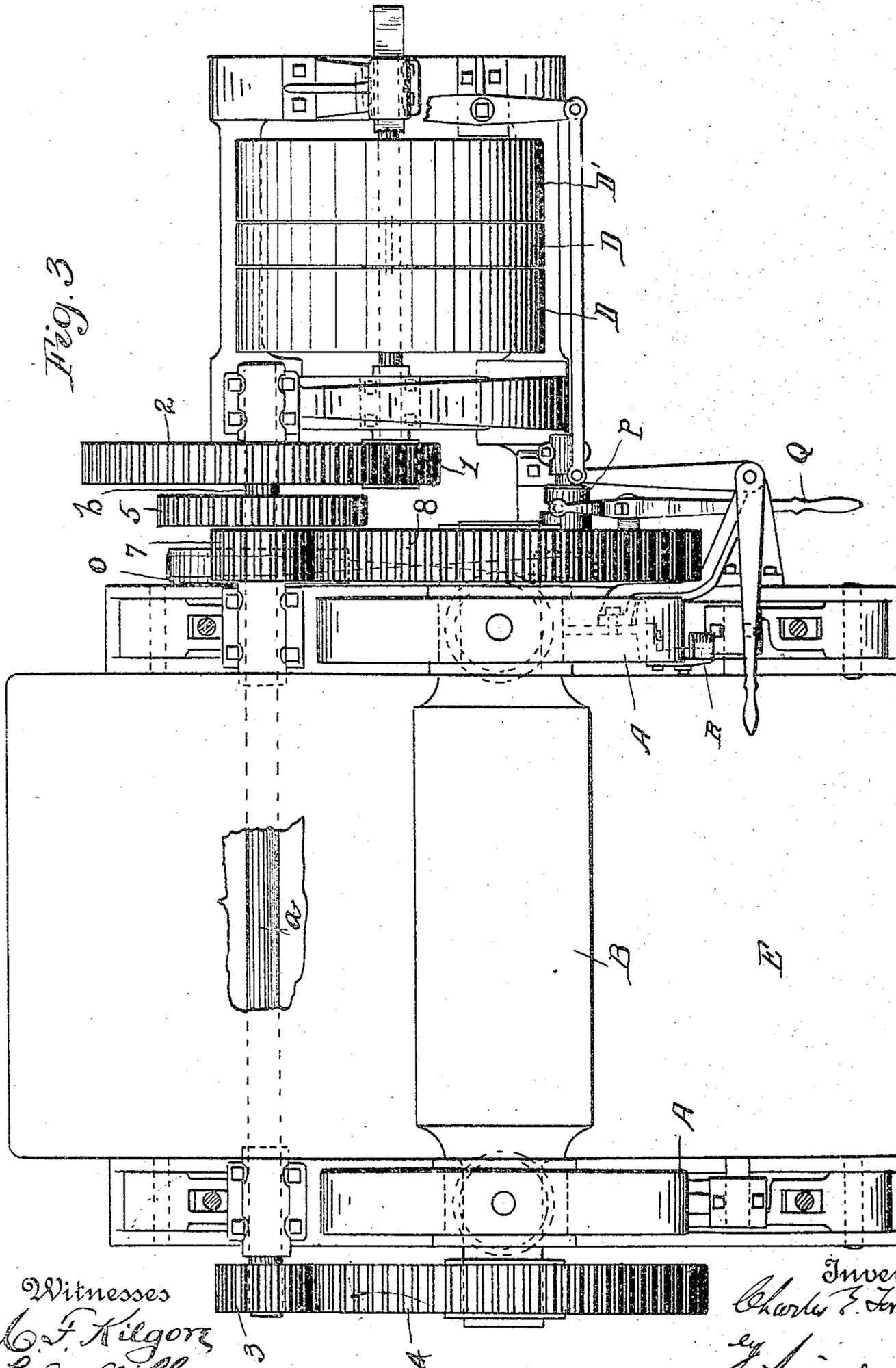


Fig. 3

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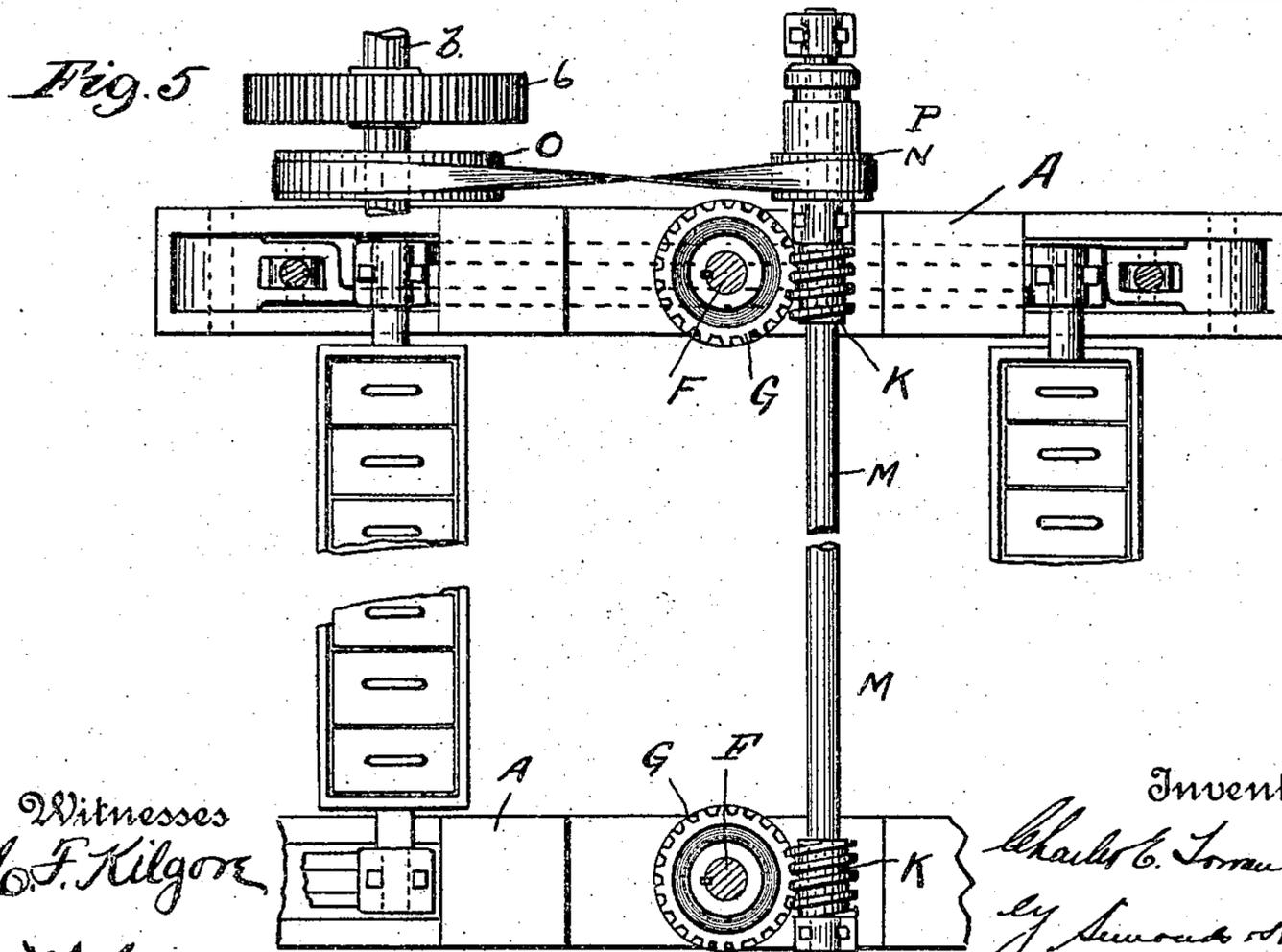
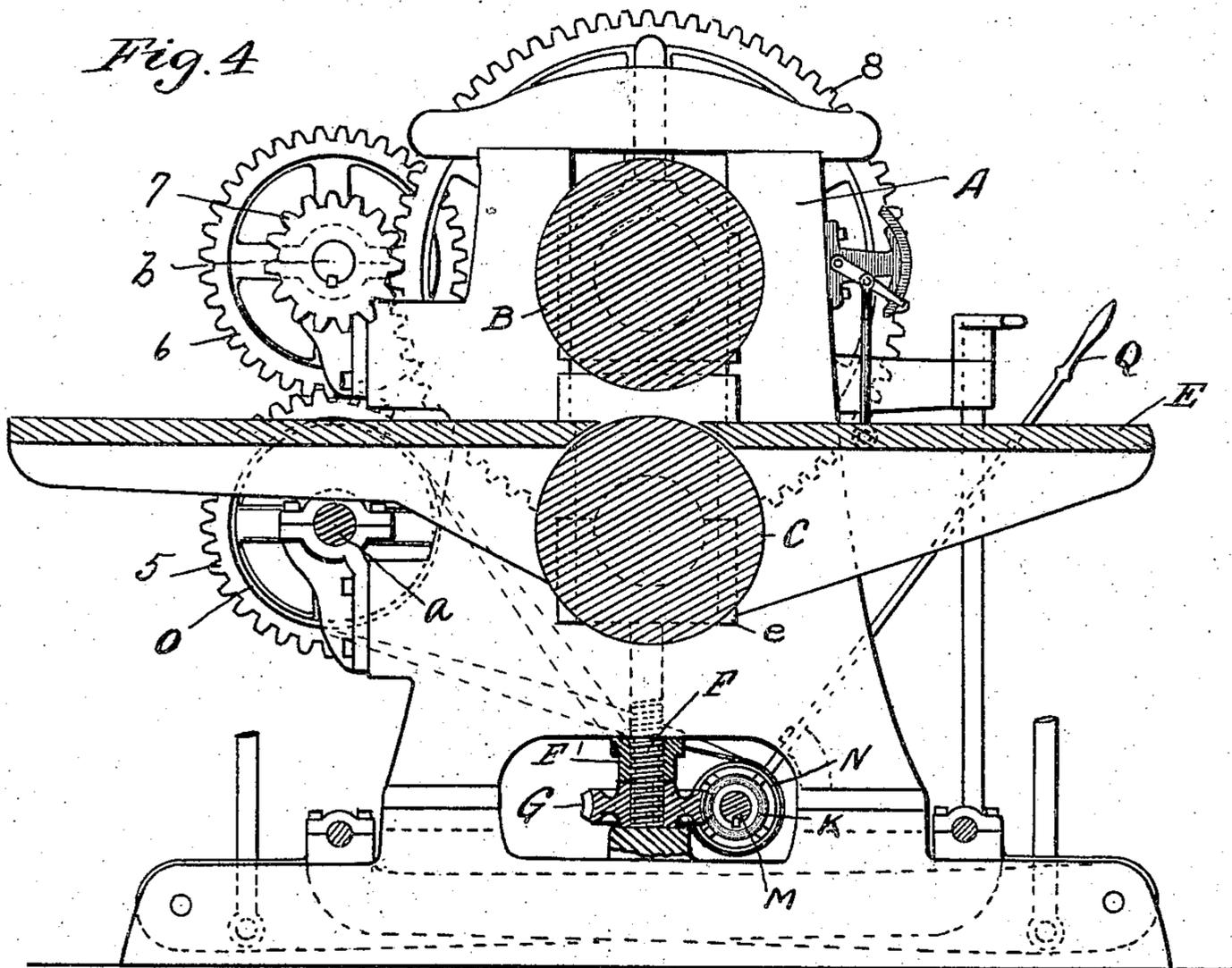
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5 SHEETS—SHEET 4.



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5 SHEETS—SHEET 5.

Fig. 6

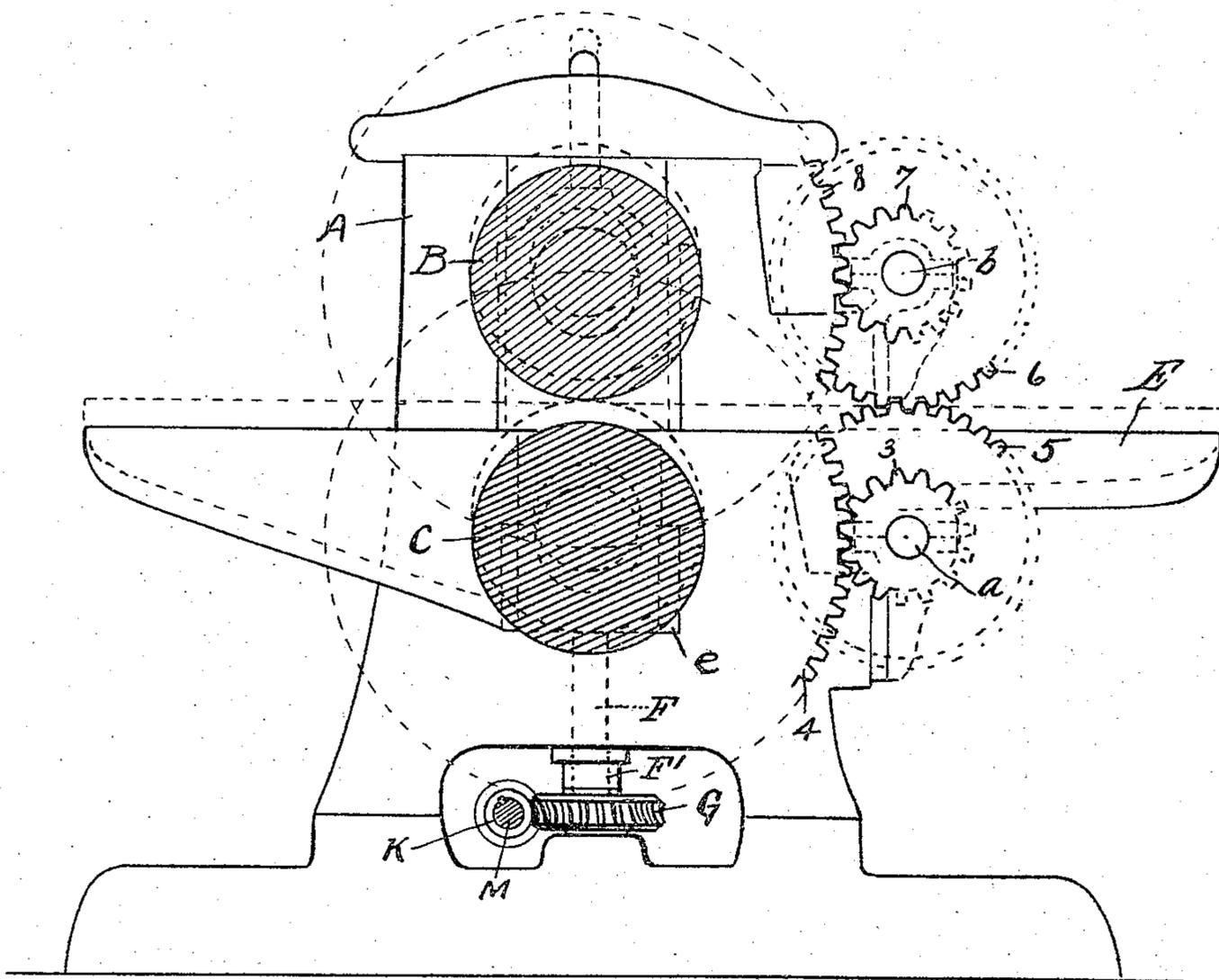
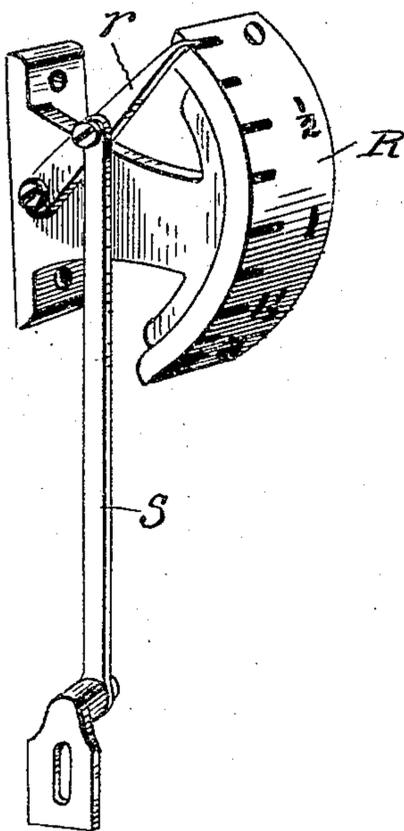


Fig. 7



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UNITED STATES PATENT OFFICE.

CHARLES E. TORRANCE, OF FLORENCE, MASSACHUSETTS.

PAPER-FINISHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 767,320, dated August 9, 1904.

Application filed August 27, 1902. Serial No. 121,238. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. TORRANCE, a citizen of the United States of America, residing in Florence, in the county of Hampshire and State of Massachusetts, have invented certain new and useful Improvements in Paper-Finishing Machines, of which the following is a specification.

The object of the invention is to provide a machine of the class specified having features of novelty and advantage.

The machine shown in the drawings is what is known in the art as a "plating-machine," it being the machine which burnishes or glazes the surface of the paper. The ordinary plating-machine has suitable columns and rolls and driving mechanism for the rolls. The under roll is generally movable up and down in the frame. A package of unfinished paper having a metal plate at top and bottom and between the sheets is passed back and forth between these rolls, and by this operation the surface of the paper is finished. In the present machines of this class the two rolls are directly connected one with the other by means of spur-gears. They must be adjusted toward and away from one another in order to accommodate stacks of different thicknesses and also to vary the pressure to which these stacks of paper are subjected. It is readily seen that as the rolls are moved away from each other the gears are drawn out of proper mesh and drive at or near the points of the teeth. The tendency is and in actual practice it often happens that the teeth of these gears are broken, occasioning a considerable loss of time while the machine is idle and expense in replacing the gears. Another serious objection is that when the teeth are driving at their points there is considerable backlash. When the stack of paper passes between the rolls once and the machine is reversed, this backlash drags the metal sheets on the surface of the paper and crocks it and breaks it, which proves to be another source of considerable loss to the manufacturer. For these reasons the output of the present plating-machines is very limited, and the object of my invention is to provide a machine in which these objec-

tions are overcome and in which the output is greatly increased.

Other objects of my invention are to render more easy the control and manipulation of the machine, and especially the pressure device for the rolls, and to provide a suitable gage for the pressure.

In the drawings, Figure 1 is a side elevation of a machine embodying my invention. Fig. 2 is a view looking from the left of Fig. 1 or at what may be called the "front" of the machine. Fig. 3 is a plan view. Fig. 4 is a view in section on the line *xx* of Fig. 2 with parts broken away to show the improved device for raising and lowering the lower roll. Fig. 5 is a plan view showing in detail the device for raising and lowering the lower roll. Fig. 6 is in the nature of a diagrammatic view showing the relation of the rolls, the table, and the gearing. Fig. 7 is a detail perspective view of an indicating mechanism.

In the drawings the columns are seen at A A and the rolls at B C, journaled in the columns A A. There are suitable devices for maintaining pressure on these rolls. Power is brought to the machine by open and crossed belts passing about the loose pulleys D and capable of being shifted onto fast pulley D' by suitable shifters. A pinion 1 is secured to the shaft on which the pulleys D are mounted. This pinion meshes with a gear 2 on the counter-shaft *a*, which runs across the machine, as seen in Fig. 3, and carries at its end the pinion 3, meshing with the gear 4, which is mounted on the shaft of the roll C. On the counter-shaft *a*, adjacent to the gear 2, is secured the gear 5, which meshes with a gear 6, mounted on a short shaft *b*. This shaft *b* also carries the pinion 7, which meshes with the gear 8, secured to the shaft of the roll B. From this it is seen that the roll C is driven from the source of power at *d* through the pinion 1, gear 2, pinion 3, and gear 4 and that the roll B is driven from the same source of power *d* through the pinion 1, gears 2 5 6, pinion 7, and gear 8. By this mechanism for driving the two rolls B C the gears which are used may be of the ordinary kind so far as the size of the teeth is concerned, and the limit

of the adjustment of the two rolls toward and away from each other is determined practically by the requirements and by the vertical movement of the roll-journals which the columns will permit, and any such adjustment will not cause the objectionable backlash.

The roll C is movable toward and away from the roll B, and the mechanism by which this movement is accomplished will now be described.

The journal-boxes *e* of the roll C are supported on the pillars F, which are exteriorly threaded. These pillars pass through nuts or collars F', which are held against rotation, and the worm-gears G, which are splined thereto. Meshing with these worm-gears G are the pinions K, both mounted on the shaft M, which is provided at one end with the pulley N, about which passes a belt from the pulley O, mounted on the shaft *b*. The pulley N normally runs loose on the shaft M, but may be thrown into driving connection therewith by the friction-clutch P, which is controlled by the hand-lever Q. From this construction it is seen that the distance between the rolls B C can be altered by rotating the shaft *b* in the proper direction from the pulleys D and throwing in the clutch P to drive the shaft M and the worm-gears G, these worm-gears G feeding the pillars up or down, as desired.

The roll C is provided with the table E, which is carried on the journals of the roll C and moves up and down therewith. In order to tell the exact adjustment of the rolls B C, I provide the indicator in the form of a segment R, having a lever *r*, pivoted at the center of the part forming the segment R and

provided with a finger coöperating with the graduations. This lever *r* is connected with the table E by the link S.

These plating-machines are used for finishing a finer grade of paper—such as is used for lithographing purposes, printing, &c.—and it is necessary that its surface be finished with the greatest uniformity. The character and degree of the finishing is governed by the pressure on the rolls and the amount of opening between them, and the device just described permits me to keep this pressure constant and produce the paper of uniform finish.

I claim as my invention—

1. In a machine of the class specified the columns, the upper roll suitably supported therein, the lower roll supported on pillars, gears splined to said pillars, pinion meshing with said gears and mounted on a shaft, clutch connections between said shaft and the driving-pulley, a suitable column into which said pillars are threaded, and means for controlling the clutch, substantially as described and for the purposes set forth.

2. In combination in a device of the class specified the columns, the rolls one of which is movable toward and away from the other, a table carried on the journals of said movable roll, an indicator, and connections between said indicator and said movable roll, substantially as described and for the purposes set forth.

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

CHARLES E. TORRANCE.

Witnesses:

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