

A. W. CASE.
PAPER POLISHING MACHINE.

No. 500,191.

Patented June 27, 1893.

Fig. 1

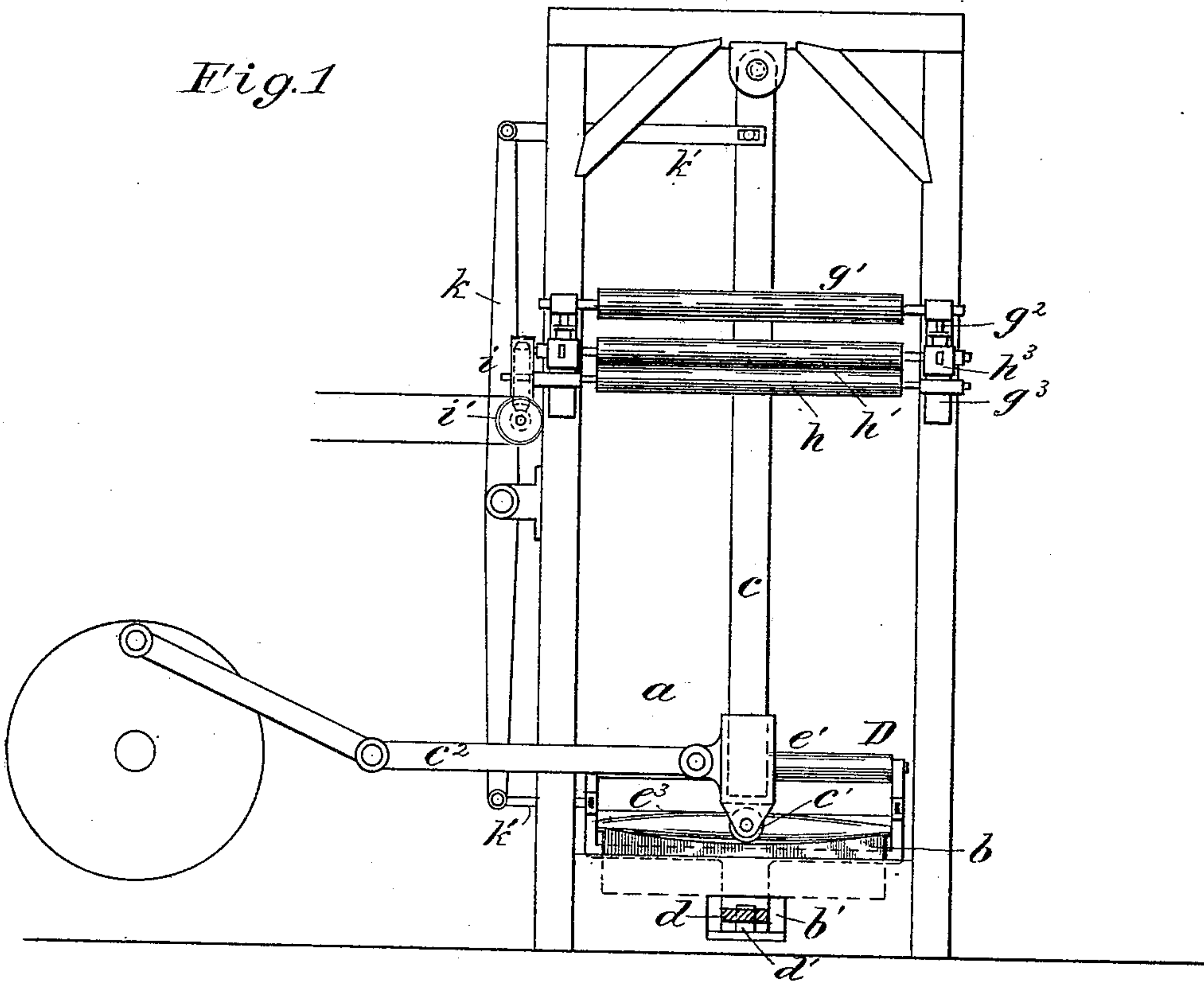
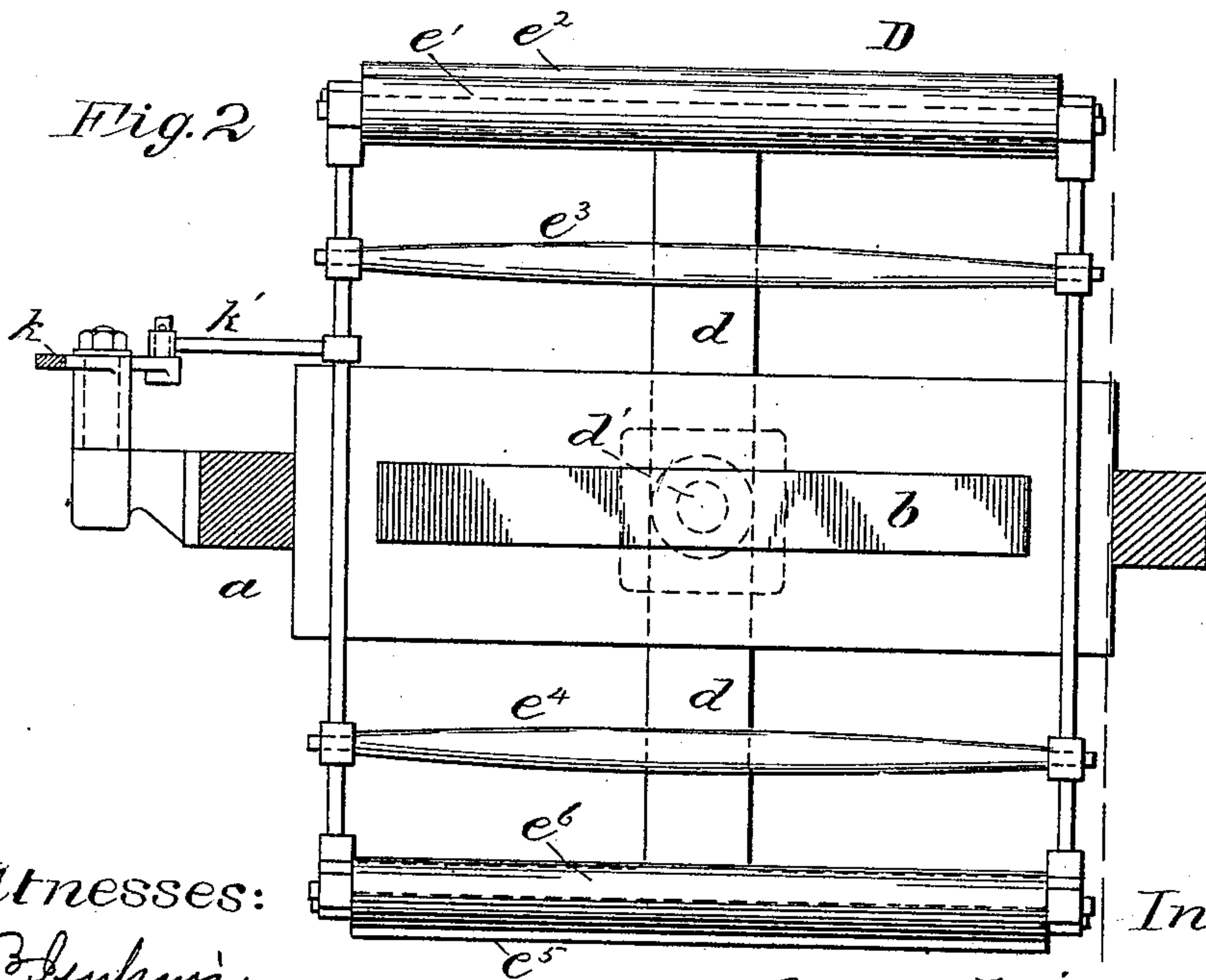


Fig. 2



Witnesses:
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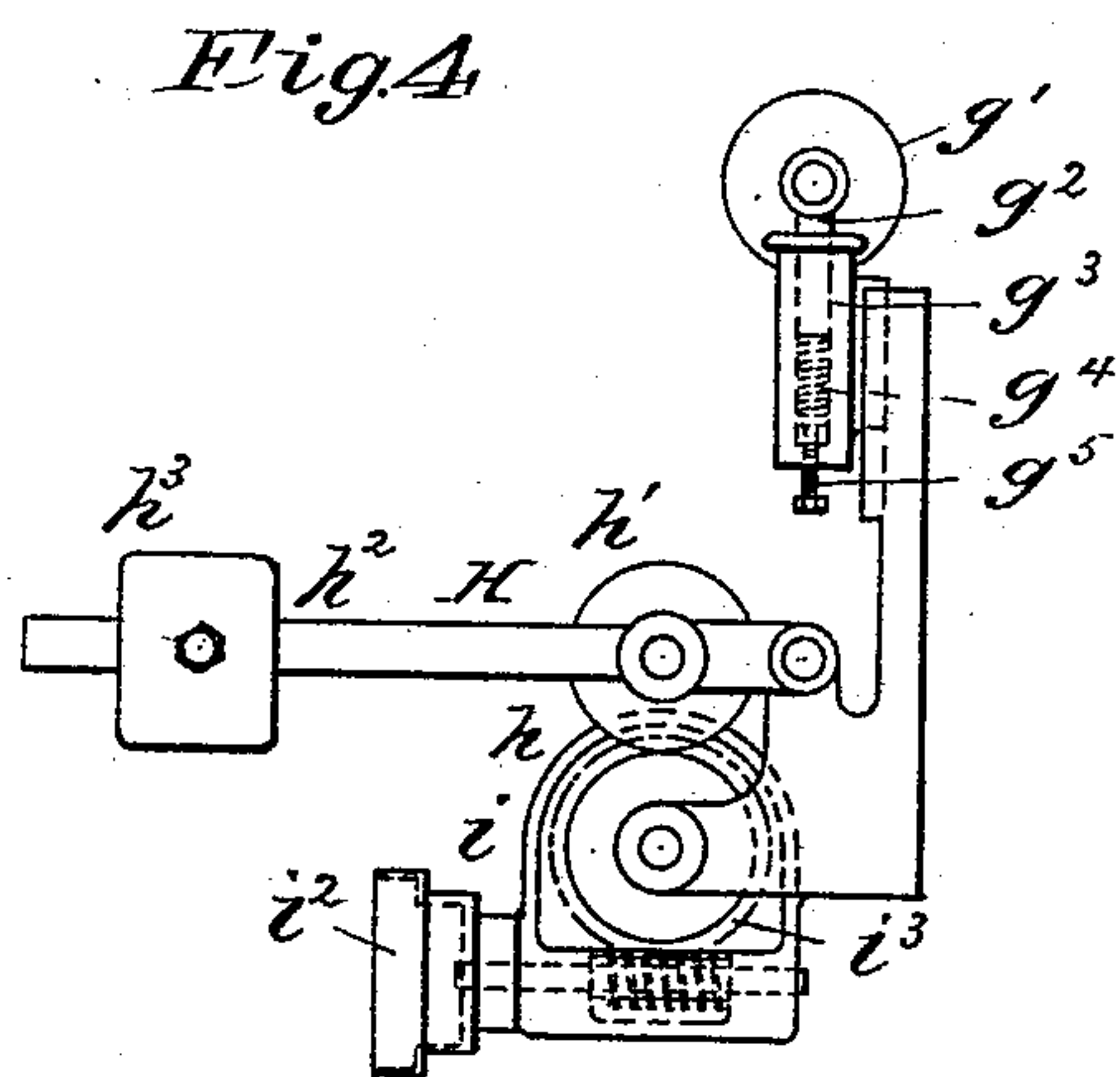
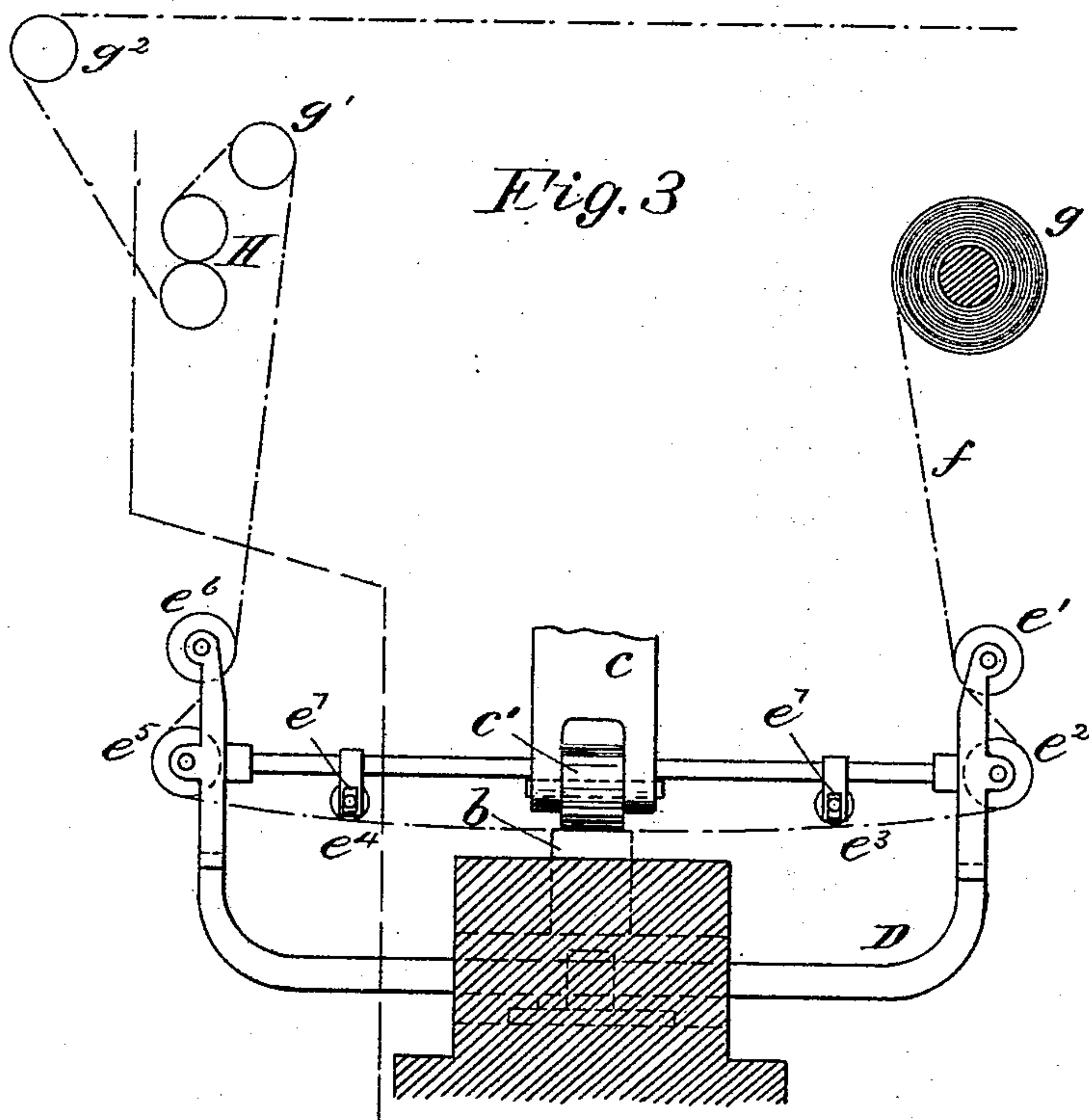
Inventor :

Albert Willard Case
by Chas. L. Burdett
att'y

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UNITED STATES PATENT OFFICE.

ALBERT WILLARD CASE, OF HIGHLAND PARK, CONNECTICUT.

PAPER-POLISHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 500,191, dated June 27, 1893.

Application filed September 4, 1891. Serial No. 404,689. (No model.)

To all whom it may concern:

Be it known that I, ALBERT WILLARD CASE, of Highland Park, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Paper-Polishing Machines, of which the following is a full, clear, and exact description, whereby any one skilled in the art can make and use the same.

10 The object of my invention is to provide an improved apparatus or machine by means of which a continuous strip of paper may be finished and polished; and my invention consists in the combination with the polishing
15 device of improved mechanism whereby an effective alternating progressive movement is given to the opposite edges of the strip of paper, and it further consists in details of the several parts making up the mechanism as a
20 whole and in their combination as more particularly hereinafter described and pointed out in the claims.

Referring to the drawings: Figure 1 is a detail view in elevation of a machine embodying my invention. Fig. 2 is a detail plan view of the bed plate and the rocking feeder frame. Fig. 3 is a detail view on enlarged scale in cross section of the bed of the polishing machine and in side view of the feeder frame.
30 Fig. 4 is a detail side view of the feed roll driving mechanism.

In the accompanying drawings the letter *a* denotes a paper polishing machine; *b* the bed plate with its upper surface concaved to conform to the arc through which the polishing roll *c'* borne on the lower end of the lever *c* is moved, the upper end of the lever being pivoted to the frame and the lever as a whole vibrated by suitable means as a crank connected to the lever by the intermediate rod *c*². This form of polishing device is preferred as it enables the ready adjustment of the degree of pressure to be made by changing the length of the arm by any convenient
45 adjusting device.

The machine thus far described is an old device and it has been the practice in some instances prior to my invention to polish paper board in sheets by inserting the edge of
50 such sheet between the bed and the roll so that the latter will travel back and forth across the sheet that is fed across the bed side-

wise of the path of movement of the polishing roll. This method of polishing has involved the cutting up of the paper which comes
55 in a continuous sheet from the paper making machine into sheets of proper size to enable it to be handled in the operation of polishing.

A difficulty has been experienced in attempts to polish the paper in the continuous
60 strip owing to the fact that an alternating progressive motion must be given to opposite edges of the strip in relation to the vibrating movement of the polishing roll across the strip. In order to effect the proper movement
65 of the paper across the bed plate *b*, I employ a rocking feeder frame *D* that is pivotally supported on the bed plate, a central cross-bar *d* of the frame passing through an opening *b'* below the bed and in the base of the
70 machine where it is supported on a pivot *d'* directly below the center of the bed. This frame *D* supports on opposite sides of the bed a series of rolls that may be properly termed guide rolls and that are preferably arranged
75 with their axes substantially parallel to each other. Three of these rolls *e'*, *e*² and *e*³ are on one side of the frame and three others *e*⁴, *e*⁵ and *e*⁶ are on the opposite side. Two of these
80 *e*³ and *e*⁴ are supported in slotted bearings *e*⁷ in such position that the rolls rest with their whole weight upon the upper surface of a continuous strip of paper *f* as it passes between
85 and under the rolls and beneath the polishing roll. These two rolls *e*³ and *e*⁴ that are loosely mounted in slotted bearings so as to permit
90 of a vertical movement are larger at the center than near the ends the surfaces being preferably formed on curved lines that conform substantially to the curve of the concave surface of the bed plate. This mechanism just
95 described I have termed an alternating feed mechanism to distinguish the one device from a plural number of devices used for a similar purpose in the prior art.

On one side of the frame of the machine *a* bearings are formed that support a roll of paper *g* and from this roll the paper is led between rolls *e'* and *e*² and around underneath rolls *e*², *e*³, *e*⁴, and *e*⁵ and over those to a spring
100 seated guide roll *g'* from which it passes down between the feed rolls *H* and from this is conveyed over other guide roll or rolls *g*² to any suitable place or machine for trimming or re-

winding the strip. The feed rolls H are supported in brackets on the frame the rolls extending transversely across the frame at a suitable height above the bed of the machine to allow the paper to swing freely with the rocking movement of the feeder frame. One of the brackets i supports a worm i' having on the outer end of its shaft the pulleys i^2 over which a belt from any suitable source of power passes and by the movement of which the worm is driven. The worm is in engagement with a worm gear i^3 that is fast to the shaft of the lower feed roll h while the upper feed roll h' is supported in bearings in the levers h^2 the outer end of the levers being provided with weights h^3 that are adjustable along the lever for the purpose of determining the degree of pressure of the roller h' upon the roller h ; the levers h^2 being pivoted at their inner ends to the brackets in the usual manner. The guide roll g' is supported at the opposite ends of its axis in yielding bearing blocks g^2 that extend into a spring box g^3 fast to the bracket. Each bearing block is supported on a spring g^4 located between the lower end of the bearing block and the upper end of an adjustable screw g^5 by means of which the tension of the spring may be adjusted. The frame D is given a rocking movement by means of the lever k pivotally supported on the upright frame of the machine and connected by means of rods k' to the frame D and to the lever c that bears the polishing roll in such manner that when the polishing roll is at one limit of its vibration the frame is given a rocking movement that will tend to draw a strip of paper across the opposite edge of the bed, and when the polishing roll has vibrated to the opposite end of its path of swinging movement the frame D is rocked in the opposite direction so as to cause the paper to feed across the opposite edge of the bed. This rocking of the frame D at a time when the lever c is at or near its outward limit of vibration may be imparted, as shown in Fig. 1 of the drawings, by providing a slot in the inner end of the upper rod k' , this slot engaging a pin on the lever c , or a like means of connection may be made between the frame D and the lower rod k' , and a greater or less movement of the frame D may be given at such time by means of one or more connecting levers suitably pivoted to the frame and connecting the lever k with the lever c or with the frame D. The operation of the feeding mechanism produces a direct pull upon the paper exerted by the feed rolls H and the sidewise rocking movement of the frame D produces what I term an alternating feed, that is, the paper is fed across the polishing bed in a series of movements that alternate with the vibrating movement of the polishing roll and such an alternating feed is necessary in order to enable the paper to properly feed across the concave surface of the bed without being torn or injured by the polishing mechanism. It is by the application

of this alternating feed that I have been able to properly polish a continuous strip of paper. The dance rolls e^3 and e^4 having barrel shaped surfaces are supported at times wholly upon the paper and they aid in producing the proper feeding movement of the paper beneath the finishing roll.

In the within description and drawings there is described and shown one way in which the rocking feeder frame may be given a rocking movement at a time when the lever supporting the polishing roll is at or near its outward vibratory movement, but any means by which such movement to the frame is imparted will come within the scope of my invention or such swinging movement of the frame D may be made continuous during the vibrating movement of the lever c although the form described is preferred.

In the foregoing description the rolls mounted in the rocking feeder frame have been designated by me as guide rolls instead of feed or feed and guide rolls from the fact that the rolls act more as a guide for the paper as it is fed over the bed plate b , the movement of the rolls and the frame together acting more in the sense of a feed device.

I claim as my invention—

1. In combination with a reciprocating polishing roll moving in a curved path, a rocking feeder frame bearing a series of guide rolls, means for imparting a rocking movement to the frame and a feed device whereby a continuous strip of paper is drawn beneath the polishing roll, all substantially as described.

2. In combination with a vibrating polishing device a rocking feeder frame bearing a series of guide rolls upon opposite sides of the path of movement of the polishing device including the dance rolls arranged in slotted bearings on opposite sides of the path of movement of the polisher, means for imparting a rocking movement to the frame and the feed device, all substantially as described.

3. In combination with a vibrating polishing device, a feeder frame, means for imparting a swinging movement to said frame transversely across the path of movement of a strip of paper underneath the polisher, a series of guide rolls borne in the frame on opposite sides of the polishing device, the dance rolls having curved surfaces and arranged in slotted bearings in the frame, and the positive paper feed mechanism, all substantially as described.

4. In combination with a vibrating polishing device, a feeder frame pivoted in operative relation thereto, means for imparting a transverse rocking motion to the frame, guide rolls supported on the feeder frame, dance rolls having a curved surface loosely mounted on the frame, a guide roll mounted in yielding supports on the frame of the machine, paper feed rolls, and means for operating said rolls, all substantially as described.

5. In combination with a vibrating polish-

ing device moving in a curved path, means
for imparting movement to said polisher, a
rocking feeder frame bearing guide rolls and
loosely mounted dance rolls having vertical
5 play in their bearings, means for imparting a
rocking movement to the frame, the paper
feed rolls, and means for operating the same,
all substantially as described.

6. In combination with a supporting frame,
10 a polisher bed having a concave surface, a re-
ciprocating polishing roll conforming in its
vibrating motion to the surface of said bed, a

positive paper feed mechanism, an alternat-
ing feed mechanism independent of the posi-
tive paper feed mechanism, and means for 15
operating said feed mechanisms whereby a
progressive movement is imparted to the op-
posite edges of a strip of paper across the
bed, all substantially as described.

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Witnesses:

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