

(No Model.)

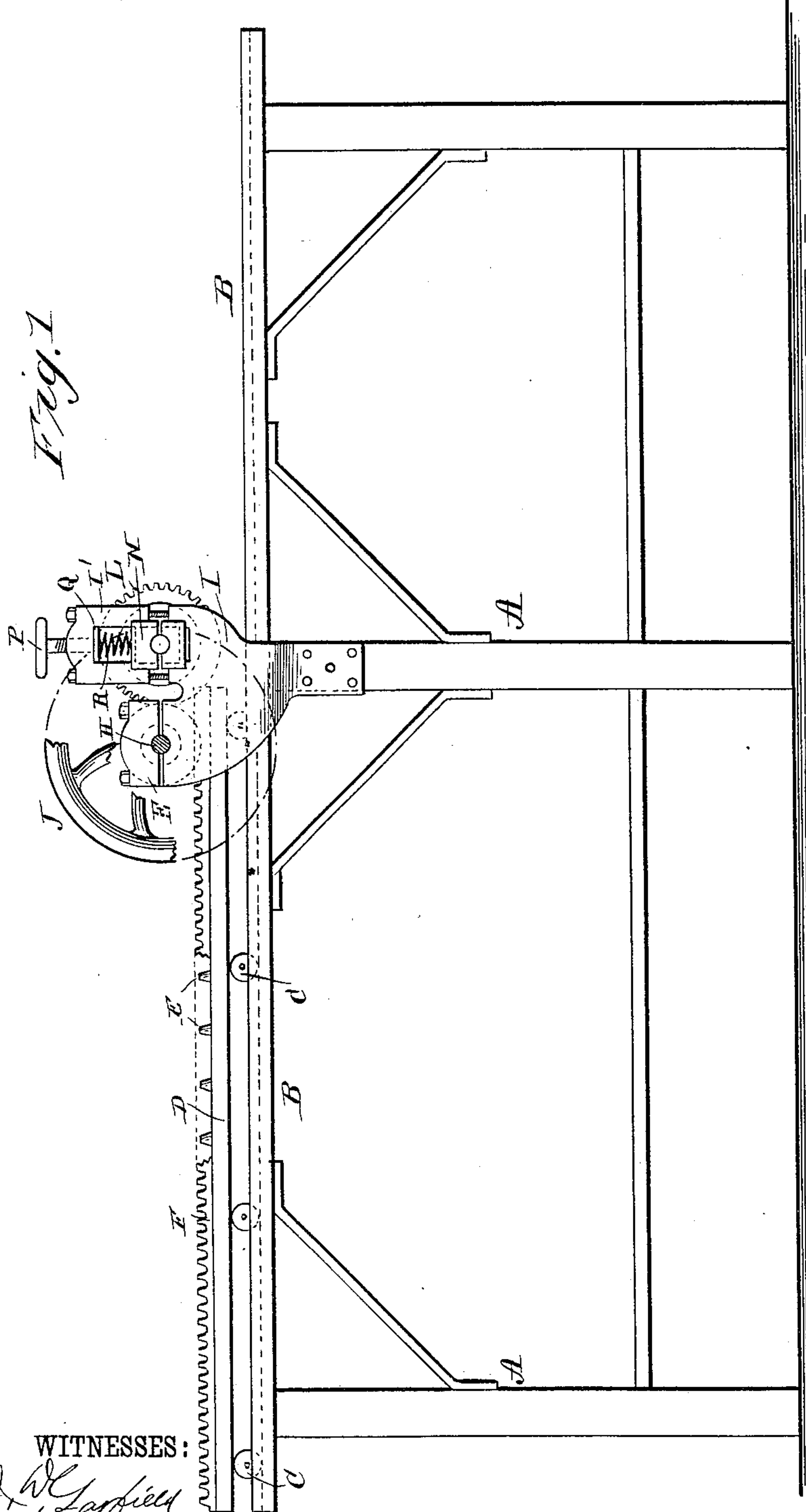
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L. & A. APPERT.

MACHINE FOR MAKING PERFORATED GLASS.

No. 362,698.

Patented May 10, 1887.



WITNESSES:

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(No Model.)

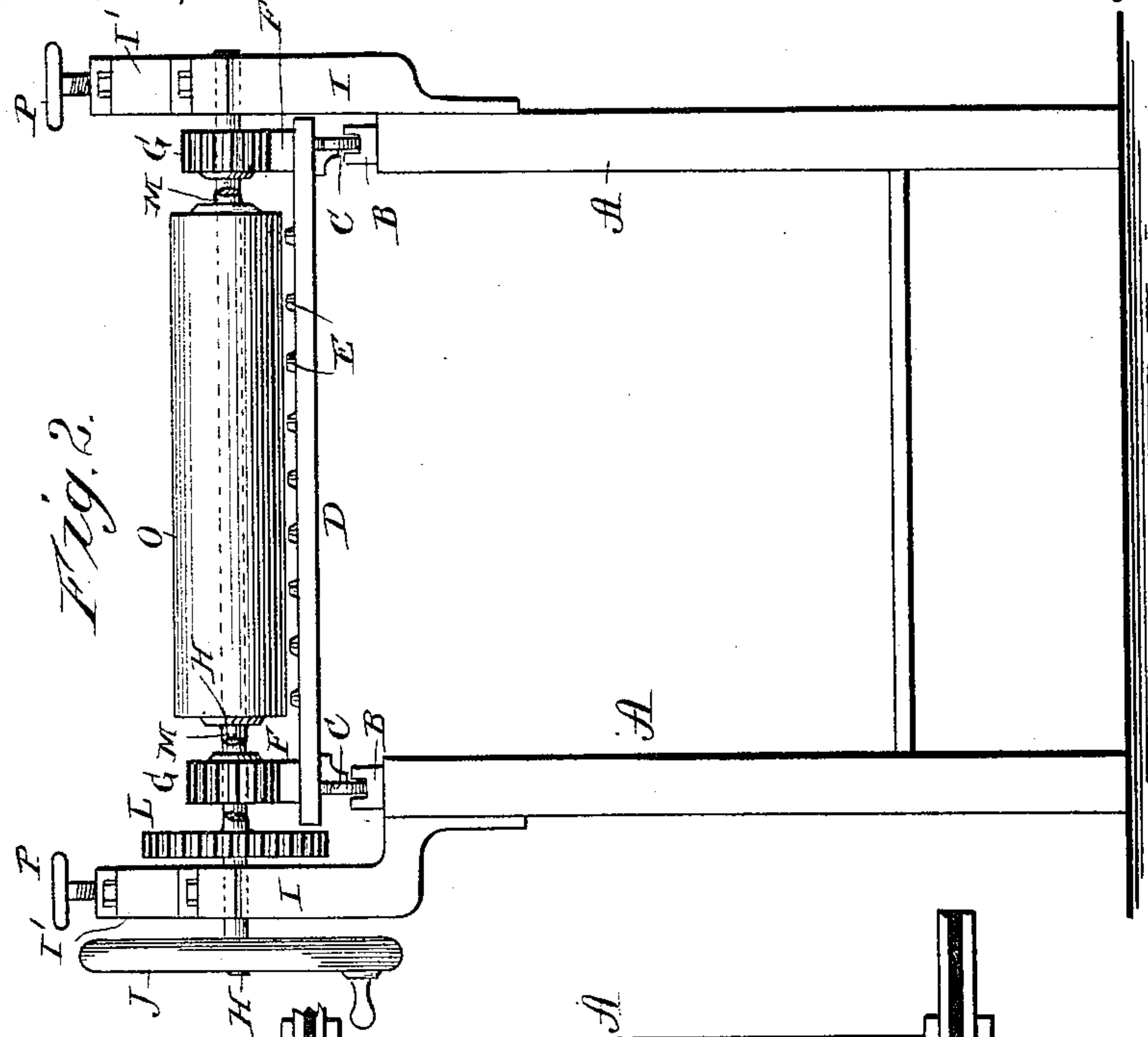
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L. & A. APPERT.

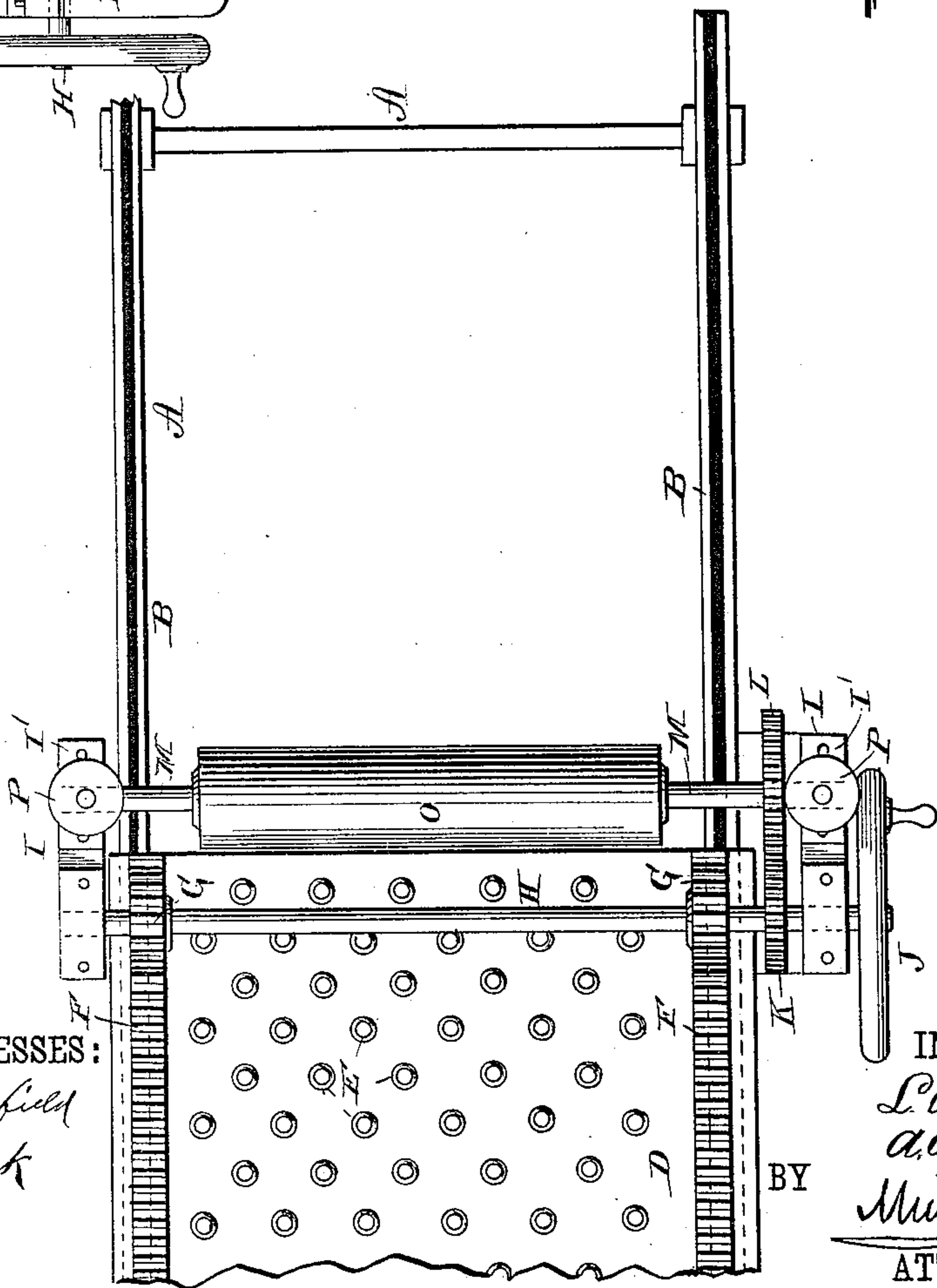
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*Fig. 3.*



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(No Model.)

3 Sheets—Sheet 3.

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Fig. 5.

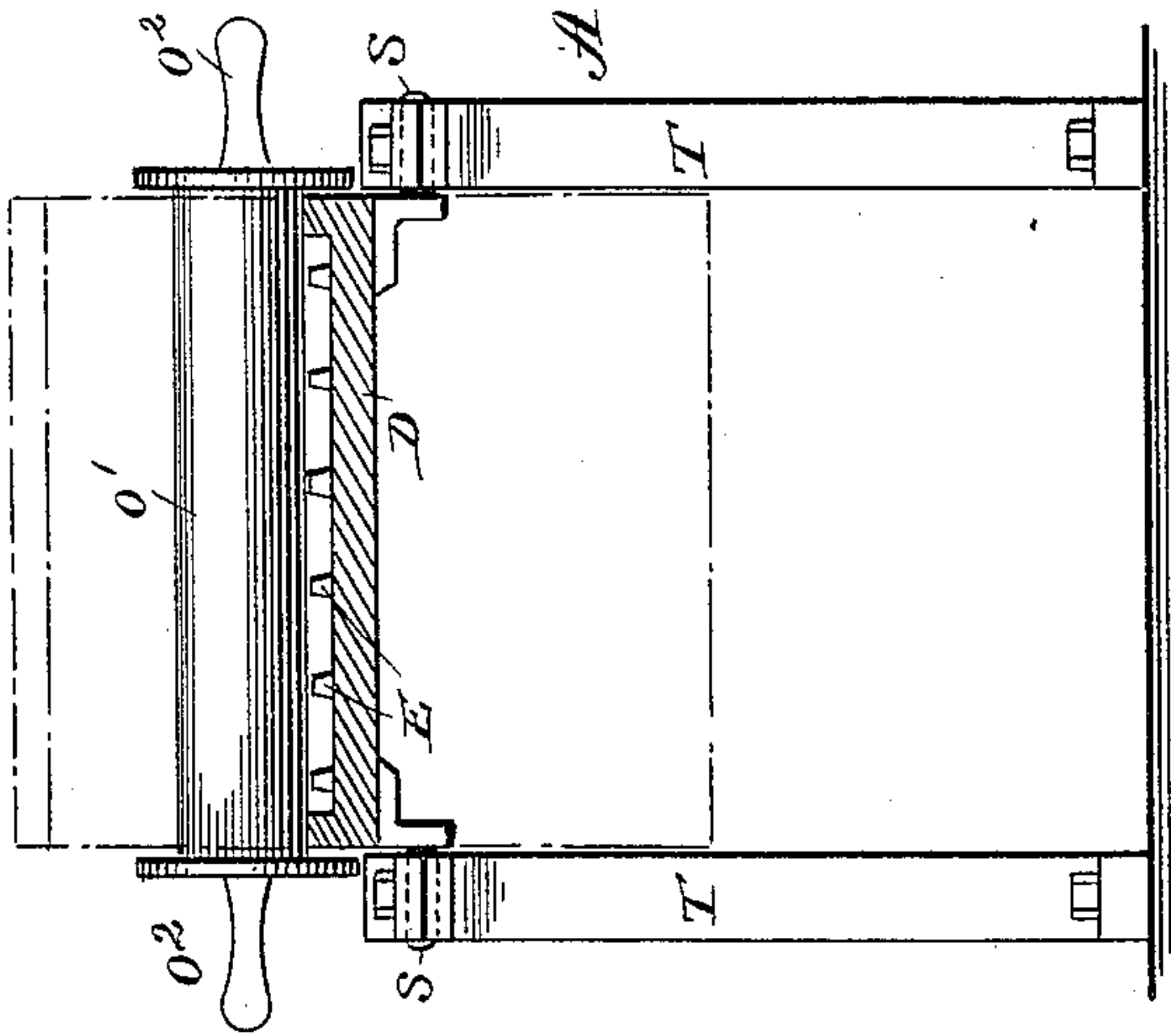
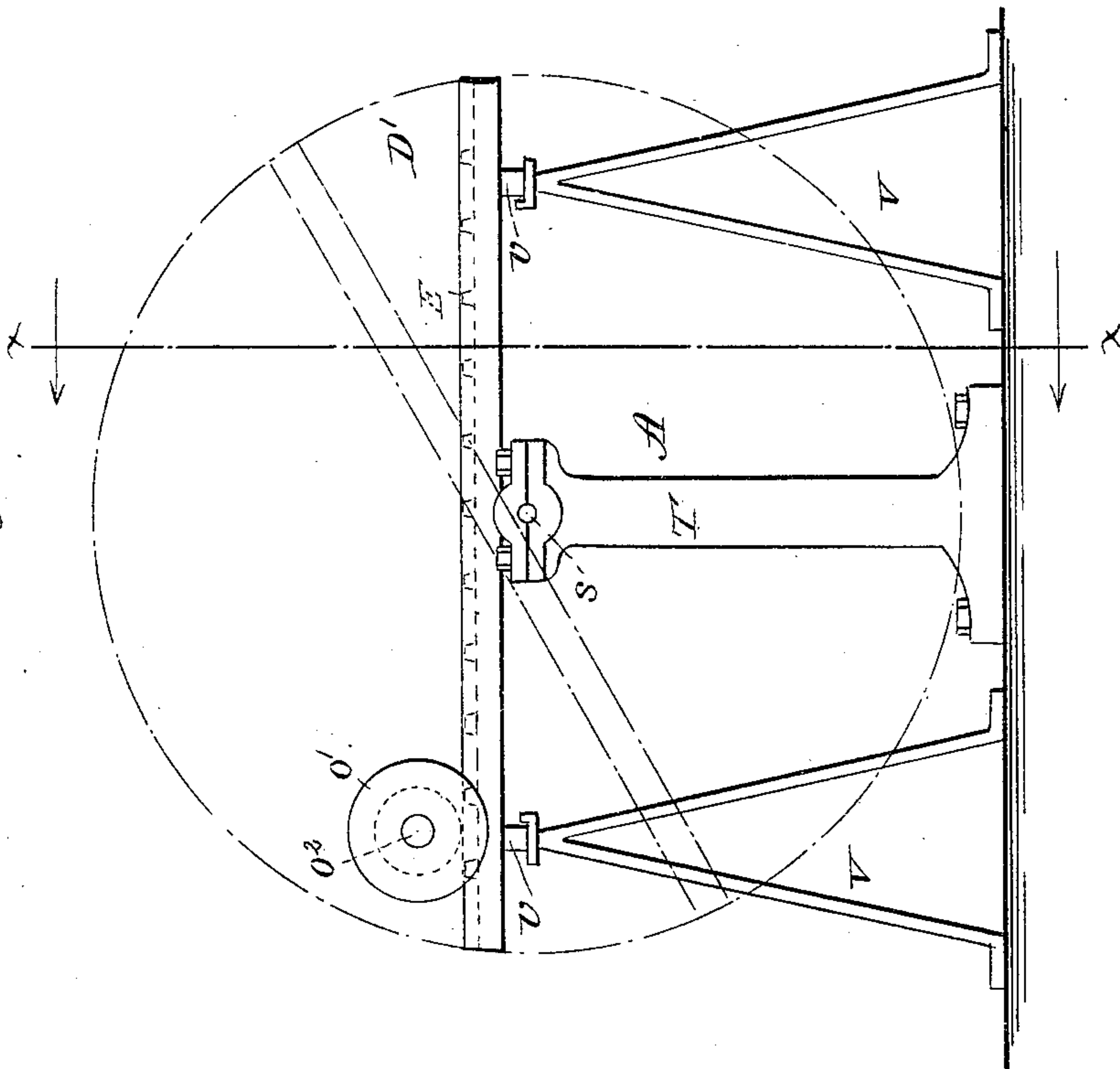


Fig. 4.



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# UNITED STATES PATENT OFFICE.

LÉON APPERT AND ADRIEN APPERT, OF PARIS, FRANCE.

## MACHINE FOR MAKING PERFORATED GLASS.

SPECIFICATION forming part of Letters Patent No. 362,698, dated May 10, 1887.

Application filed October 26, 1886. Serial No. 217,206. (No model.) Patented in France April 9, 1885, No. 168,270.

*To all whom it may concern:*

Be it known that we, LÉON APPERT and ADRIEN APPERT, both of Paris, France, have invented a new and Improved Machine for

5 Making Perforated Glass, of which the following is a full, clear, and exact description.

Our invention relates to the construction of a machine for forming glass plate with series of conical or other flaring perforations, the

10 article so produced, together with its various applications and advantages, being embodied in a separate application filed by us October 26, 1886, Serial No. 217,206, and hence requiring no further explanation in this specification.

15 The invention consists, principally, in the combination of a bed-plate for receiving the fluid or semi-fluid glass, a pressure plate or roller, and a number of conical or other tapered projections or prominences fixed upon the bed-plate or upon the pressure plate or

20 roller, all as hereinafter fully set forth. The invention also consists in the construction and combination of parts, as hereinafter

25 clearly described, and pointed out in the claims. Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

30 Figure 1 is a side elevation of our improved glass-perforating machine provided with a traveling bed-plate, parts being broken out to reveal the construction. Fig. 2 is an end elevation of the same. Fig. 3 is a plan view, parts being broken away. Fig. 4 is a side

35 elevation of the machine having a traveling pressure-roller and its bed-plate pivotally mounted for the overturning and deposition of the perforated glass plate. Fig. 5 is a sectional view on the line *x x*, Fig. 4. Referring to Figs. 1, 2, and 3, the frame A of the machine is suitably braced and supports the parallel side rails, B, on which travels the bed-plate or marble slab D. The latter

45 runs on rollers C, which may be journaled to the bed-plate or interposed loosely between the same and the rails B. Upon the bed-plate D are formed or provided a number of conical or other tapered

50 prominences, E, arranged according to the design to be produced on the glass treated.

The plate D receives the melted or semi-

fluid glass, which forms a layer, and is prevented from spreading by suitable rails or guards surrounding the bed-plate or by the attached racks F at the sides of the same. The

55 latter are engaged for moving the bed-plate by the pinions G, fixed upon the shaft H, which extends across the frame A, and is journaled in bearings on the brackets I, projecting upward from the sides of the main frame.

60 The shaft H carries a crank-wheel, J, at its end, by which it is rotated, and also a cog-wheel, K, which is in gear with the spur-wheel L, mounted on the roller-shaft M.

65 The shaft M revolves in bearings N, mounted to slide vertically in adjustable guide-extensions I' of the brackets I, and said shaft carries the pressure-roller O, which revolves in close contact with the prominences E on the

70 traveling bed-plate. The pressure of the roller O upon the prominences is regulated by the hand-wheels P, the threaded stems of which pass through the tops of the adjustable guides I' and rest upon plates

75 Q, movable vertically in the guides I', and between which and the sliding shaft-bearings N are interposed the coiled springs R. Thus by adjusting the tension of the coiled springs R the pressure of the roller O can be regulated. 80 In operation the bed-plate D, carrying the layer of semi-fluid glass, is moved under the pressure-roller O by rotating the crank-wheel J. The roller is at the same time revolved by the connecting-gearing described, and the

85 melted glass is forced down upon the prominences E, forming the desired flaring perforations in the glass. In general, some of the holes thus formed will be found not to extend entirely through the glass, and in this case the

90 thin film of glass remaining at one end of the perforation can be readily removed in any well-known way, as by a chisel, by the sand or emery blast, or by treatment with a suitable acid. 95 In Figs. 4 and 5 we have shown the bed-plate D' provided with central trunnions, S, which are mounted to turn in bearings on the standards T, erected upon a suitable support. The bed-plate is provided with the tapered

100 prominences E, as before, and is maintained in a horizontal position for receiving the fluid glass by cross-bars U, supported removably on pairs of uprights V, and placed under the



ends of the bed-plate. In this case we have shown the pressure-roller O' as movable on the bed-plate and provided with end handles, O<sup>2</sup>, for rolling it over the fluid glass. The perforations being formed as before, the roller is taken away, and the glass, having become cold and hardened, is ready for removal. We prefer to do this by removing the cross-bars or props V and overturning the bed-plate carrying the perforated plate, as indicated in dotted lines, a second plate, slab, or other suitable support being arranged beneath the tilting bed-plate or table for receiving the finished glass as the latter is deposited gently by the upsetting of the bed-plate.

Any suitable means may be employed for automatically removing the props V when the pressure-roller has finished its journey.

In either form of the machine illustrated the prominences or projections E may be fixed upon the pressure-roller instead of on the bed-plate; and in some instances we may employ in lieu of the pressure-roller the pressure-plate of the ordinary plate-glass-molding press, in

which case the tapered prominences may be fixed either upon the said pressure-plate or upon the bed-plate.

Having thus fully described our invention, we claim as new and desire to secure by Letters Patent—

1. A machine for making perforated glass, consisting of a bed-plate, a pressure-roller running over the same, and a number of projections or prominences, upon which the softened glass is pressed by the roller, substantially as shown and described.

2. In a machine for making perforated glass, the combination, with the glass-molding plate, of the pivots or trunnions on which the bed-plate is mounted centrally to overturn, and of the fixed supports on which the pivots are held, substantially as shown and described.

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