

No. 673,586.

Patented May 7, 1901.

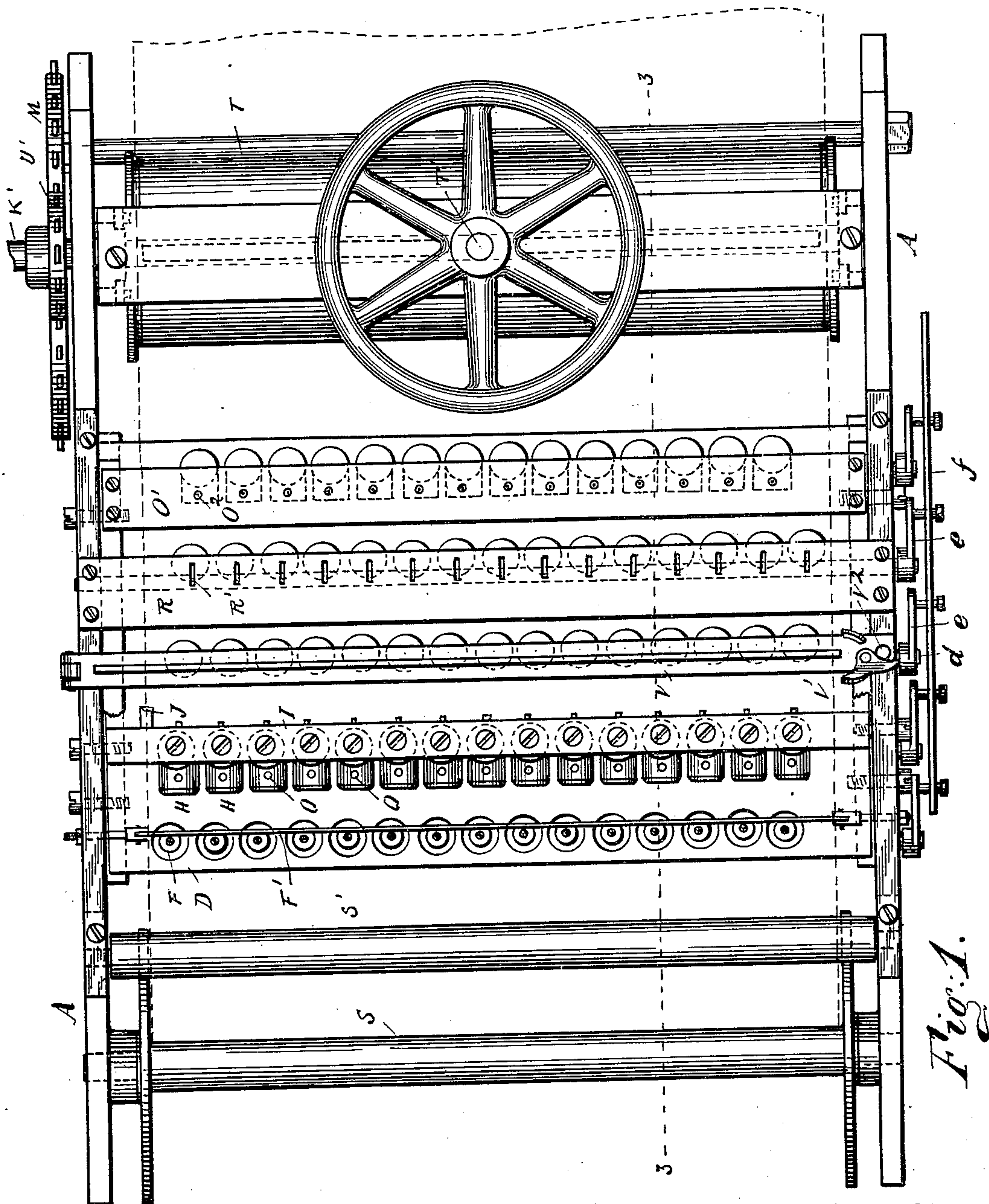
H. M. SALTER.

MACHINE FOR PUNCHING NOTE SHEETS.

(Application filed Feb. 23, 1901.)

3 Sheets—Sheet 1.

(No Model.)



WITNESSES:

F. Stallman
H. M. Flannery

INVENTOR

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No. 673,586.

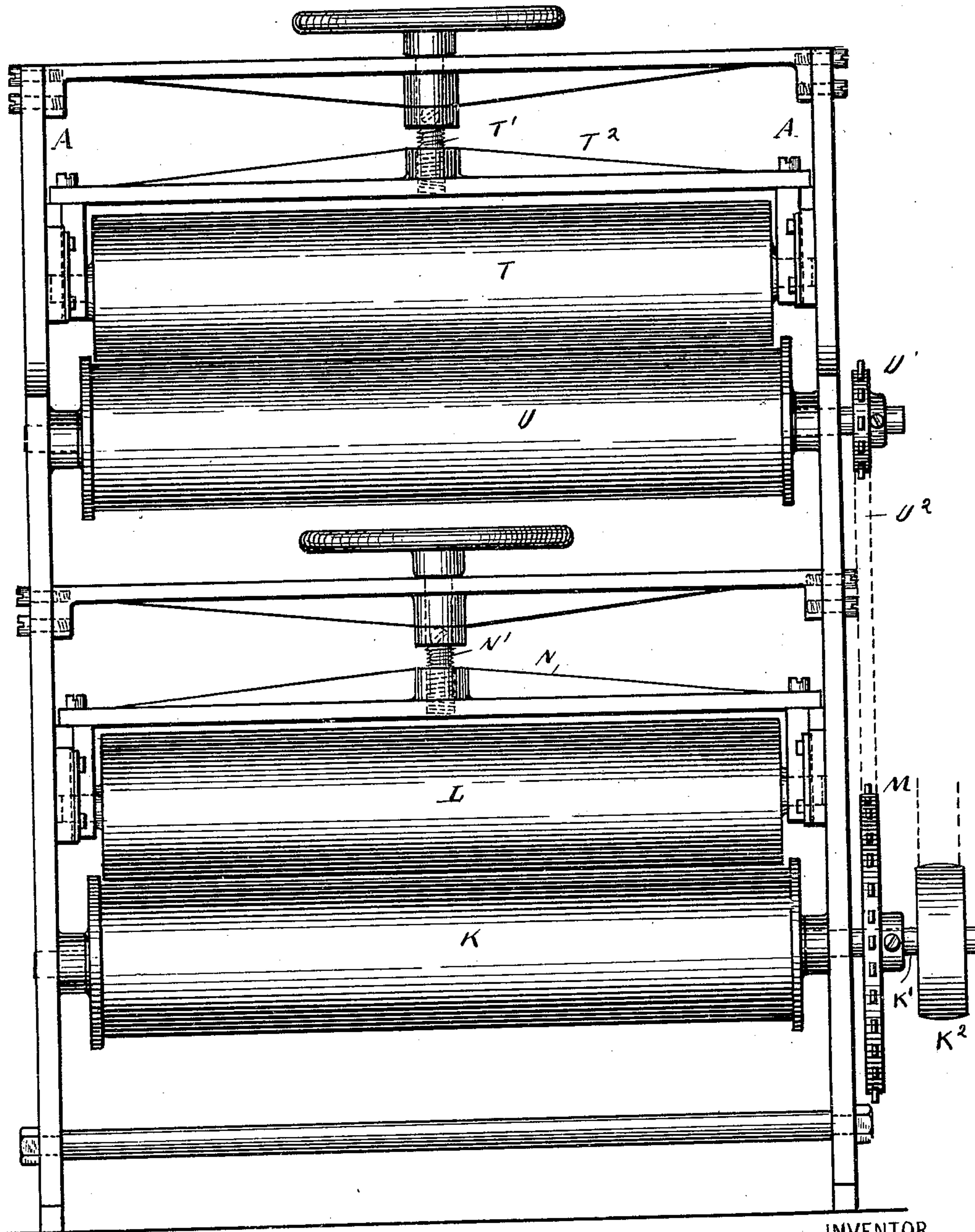
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MACHINE FOR PUNCHING NOTE SHEETS.

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3 Sheets—Sheet 2.

(No Model.)



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Fig. 2.

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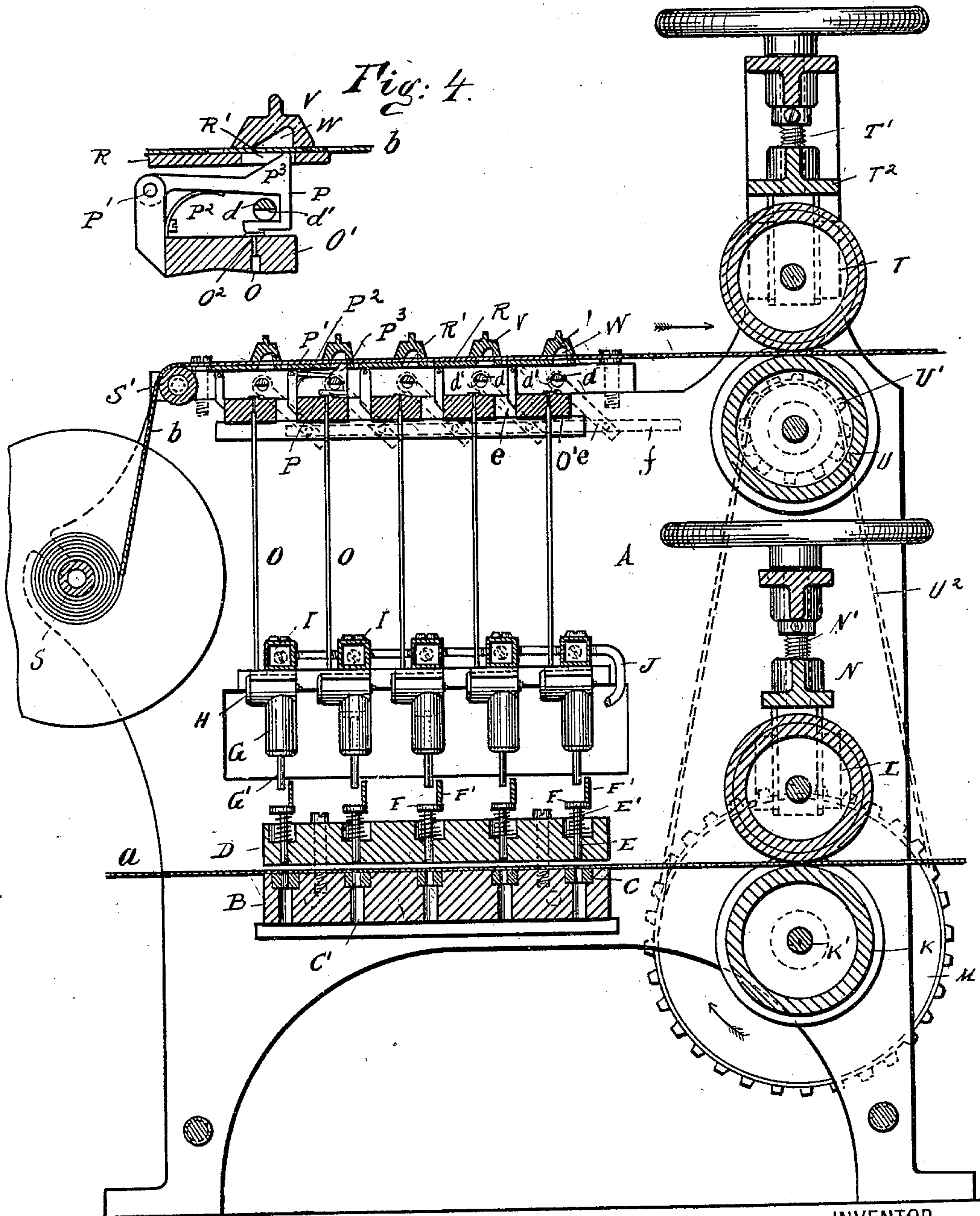
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(Application filed Feb. 23, 1901.)

(No Model.)

3 Sheets—Sheet 3.



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Fig: 3.

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UNITED STATES PATENT OFFICE.

HARRY M. SALYER, OF NEW YORK, N. Y.

MACHINE FOR PUNCHING NOTE-SHEETS.

SPECIFICATION forming part of Letters Patent No. 673,586, dated May 7, 1901.

Application filed February 23, 1901. Serial No. 48,574. (No model.)

To all whom it may concern:

Be it known that I, HARRY M. SALYER, a citizen of the United States, and a resident of the city of New York, borough of Bronx, in the county of New York and State of New York, have invented certain new and useful Improvements in Machines for Punching Note-Sheets, of which the following is a specification.

10 This invention relates to improvements in machines for perforating music-sheets such as are used for automatically-operated musical instruments.

15 The object of my invention is to provide a new and improved machine of this kind which is simple in construction, rapid in operation, and reliable in action.

20 In the accompanying drawings, forming a part of this specification, and in which like letters of reference indicate like parts in all the views, Figure 1 is a plan view of my improved music-sheet-perforating machine. Fig. 2 is a front elevation of the same. Fig. 3 is a vertical longitudinal sectional view of the same on the line 3 3 of Fig. 1. Fig. 4 is a detail view.

25 The entire mechanism is mounted in a frame A, composed of two side uprights, and in said frame a horizontal die-plate B is held, in which are held a series of transverse rows of dies C, an opening C' extending from each die down through the die-plate.

30 Directly above the die-plate and separated from the same only by a distance slightly greater than the thickness of the paper to be punched is located a punch-plate D, in which a series of vertically-reciprocating punches E are mounted in line with the dies, each punch being pressed upward by a helical spring E', which presses the head F of the punch against a transverse stop-rail F', secured in the frame A.

35 Vertically and centrally above each punch a cylinder G is secured, which contains a vertically-reciprocating piston-rod G', secured to a piston in the cylinder. (Shown in dotted lines.) Each cylinder G has a valve-casing H, and said valve-casings are in communication with a series of compressed-air chambers I, connected with a compressed-air-supply-pipe J.

40 The sheet of paper *a* to be perforated is

drawn through the space between the die-plate B and the punch-plate D by the two friction-rollers K and L, the latter being covered with rubber and the former being fixed on a shaft K', carrying a belt-pulley K² and a sprocket-wheel M. The roller L is mounted in a vertically-sliding frame N, which can be adjusted, by means of a screw N', to produce the desired pressure and friction on the paper *a*.

45 Each valve-casing H is connected with a vent-pipe O, which vent-pipes have their upper ends held in a series of transverse slats O', in the upper surfaces of which the upper end openings O² of these vent-pipes appear. The upper end of each vent-pipe is closed by a valve P, pivoted at P' and pressed upward by a spring P², which spring also presses a beveled nose P³ on the valve into a slot R' directly above it in a slat or plate R, over which slats or plates R the matrix-sheet *b*, of paper or sheet metal, is drawn. This matrix-sheet is unwound from a roller S, passes over a guide-roller S', and after passing over the slats or plates R passes between two friction-rollers T and U, the former being covered with rubber and mounted in a vertically-sliding frame T², which can be adjusted by means of a screw T'. The shaft of the roller U carries a sprocket-wheel U', over which a chain U² passes, which also passes over the sprocket-wheel M. The sprocket-wheel M has three times the diameter of the wheel U', so that the matrix-sheet *b* moves three times as fast as the paper *a*. The perforations in the matrix must be larger and separated greater distances than in the punched sheet, and for this reason the sprocket-wheel M is made larger than the sprocket-wheel U'. The matrix-sheet *b* is held down on the slats or plates R by a hinged retaining-bar V above each slat or plate R, which retaining-bar V can be held in lowered position by a latch V' and pin V². Each retaining-bar V is provided in its under side with a longitudinal groove W, into which the noses P³ of the valves P can pass after passing through the slots R' and the perforations in the matrix.

100 A shaft *d*, having a flat side *d'*, is mounted to rock over each slat or bar O' in such a manner that it extends over the valves P and when turned so that its flat side is vertical

bears down on the valves P and holds them closed. Each shaft *d* has an arm *e*, which several arms *e* are pivoted to a rod *f*, by means of which all the shafts *d* together can be adjusted to hold all the valves closed or to permit them to open when a hole in the matrix-sheet *b* arrives at any valve. The valves must be held closed while the matrix is being introduced and placed upon the slats or plates R.

Whenever a hole in the matrix-sheet *b* arrives at a valve P, the valve is thrown upward and opened by its spring P² and the nose P³ of the valve passes through the hole in the matrix-sheet. The air can thus escape through the corresponding vent-pipe O, permitting the compressed air to force down the piston in the corresponding cylinder G, whereby the corresponding punch E is forced through the sheet *a* and into its die C below it. As the matrix-sheet *b* moves forward it closes the valve P and the piston-rod G' is raised, to be again depressed when a hole arrives at the corresponding valve, and so on.

The mechanism in the valve-chamber H may be of any approved construction and forms no part of this invention.

As the cylinder G cannot be arranged as closely together as the perforations in the sheet *a* are required, they have been arranged in five groups, in which the several cylinders are staggered or offset, so that the punches of any four groups punch between the slots made by the punches of the remaining group.

Having described my invention, what I claim as new, and desire to secure as Letters Patent, is—

1. In a machine for perforating note-sheets, the combination with dies and punches and means for guiding paper between them, of a cylinder and piston above each punch, a valve-chamber for each cylinder, compressed-air chambers with which the valve-chambers are connected, a vent-pipe connected with each valve-chamber, a valve for each vent-pipe and means for conducting a matrix-sheet over said valves whereby the same are operated, substantially as herein shown and described.

2. In a machine for perforating note-sheets, the combination with dies and punches, and means for guiding paper between them, of a

spring for pressing each punch upward, a rail against which the heads of the punches can rest, a cylinder and piston above each punch, a valve-chamber for each cylinder, compressed-air chambers with which the valve-chambers are connected, a vent-pipe for each valve-chamber, a valve for each vent-pipe and means for guiding a matrix-sheet over the vent-valves whereby the same are operated, substantially as herein shown and described.

3. In a machine for perforating note-sheets, the combination with dies and punches, and means for guiding paper between the dies and punches, of a compressed-air-operated mechanism above each punch, a vent-pipe for each compressed-air-operated mechanism, a valve for each vent-pipe, which valve has a nose, a plate provided with slots for receiving the said noses, means for guiding a matrix-sheet over said plate whereby the valves are operated and a retaining-bar for holding the matrix-sheet on the plate, substantially as herein shown and described.

4. In a machine for perforating note-sheets, the combination with punches and dies and means for conducting a sheet of paper between them, of compressed-air-operated mechanisms for operating the punches, a vent-pipe for each such mechanism, a valve for each vent-pipe, and a movable shaft for holding the vent-valves closed, substantially as herein shown and described.

5. In a machine for perforating note-sheets, the combination with punches and dies, arranged in a series of rows, means for guiding paper between the punches and dies, a cylinder and piston above each punch, a vent-pipe connected with each cylinder, a valve for each vent-pipe, which vent-valves are also arranged in a series of rows, a movable shaft above each row of vent-valves, arms on the ends of the shafts, and a rod connecting the several arms, substantially as herein shown and described.

Signed at New York city, in the county of New York and State of New York, this 6th day of November, A. D. 1899.

HARRY M. SALYER.

Witnesses:

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OSCAR F. GUNZ.