

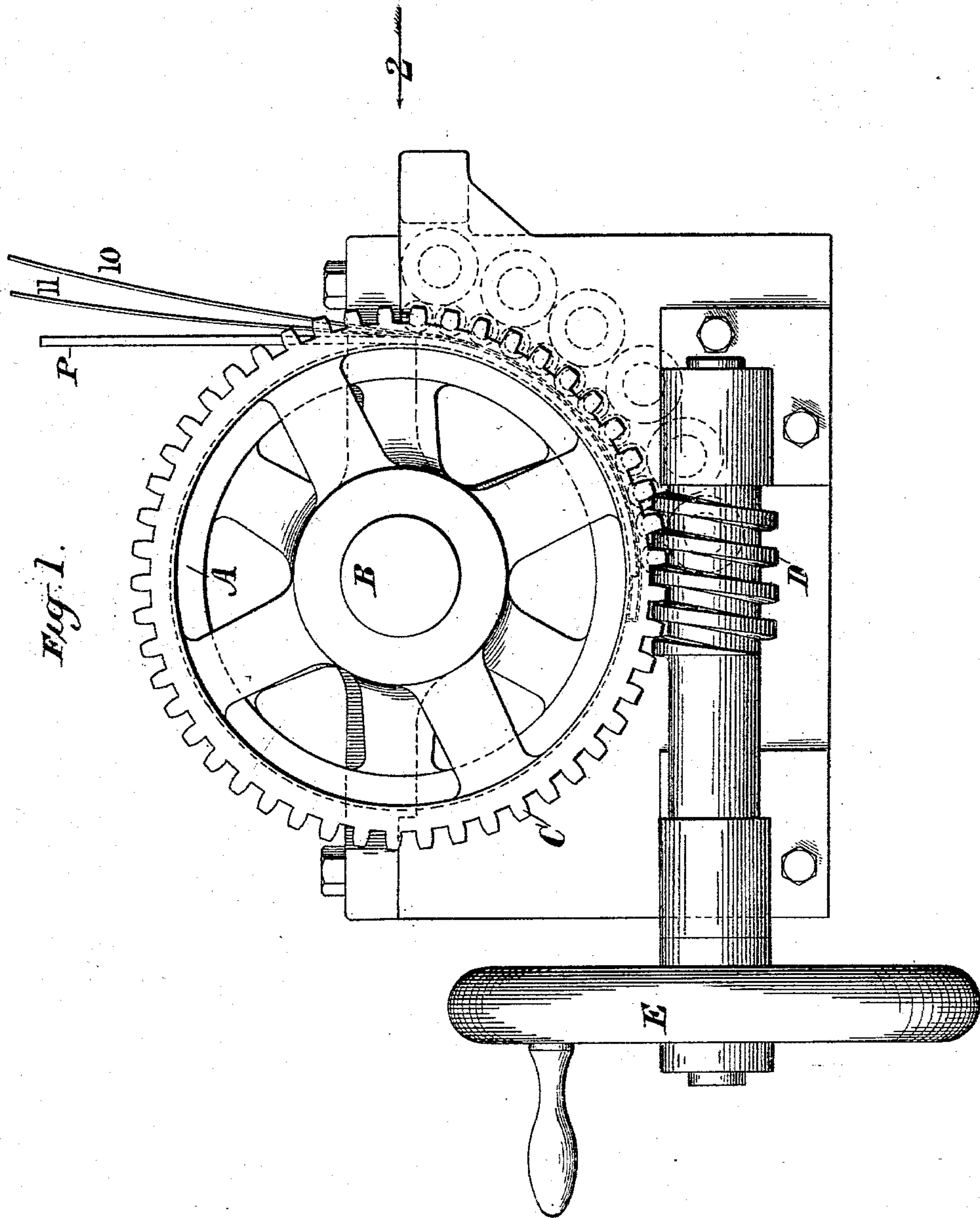
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7 Sheets—Sheet 1.

W. SPALCKHAVER.
PLATE BENDING MACHINE.

No. 551,455.

Patented Dec. 17, 1895.



Attest:
G. M. Dorsey
A. V. Bourke

Inventor
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By
Philip Munson & Phelps
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(No Model.)

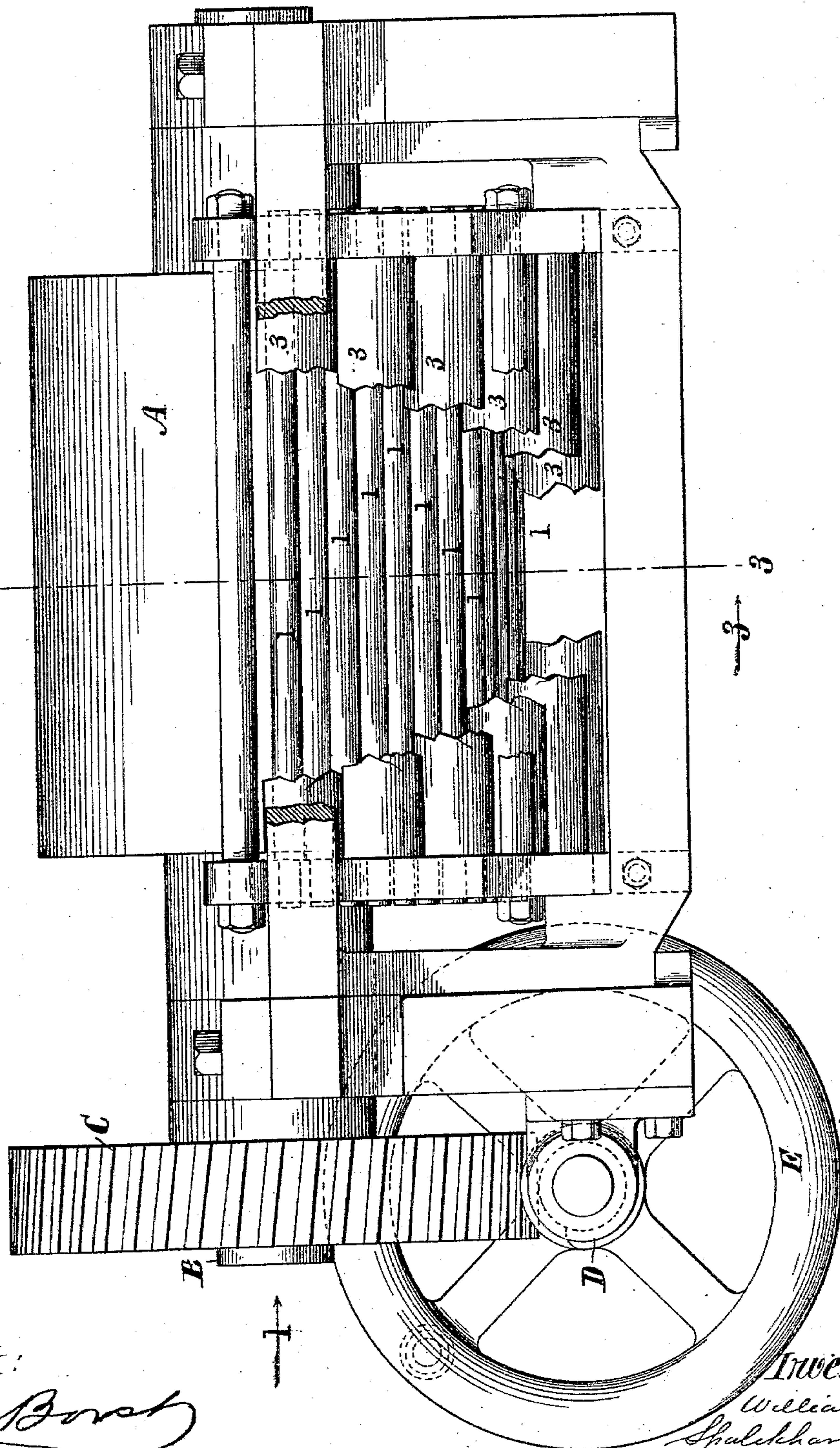
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Fig. 2.



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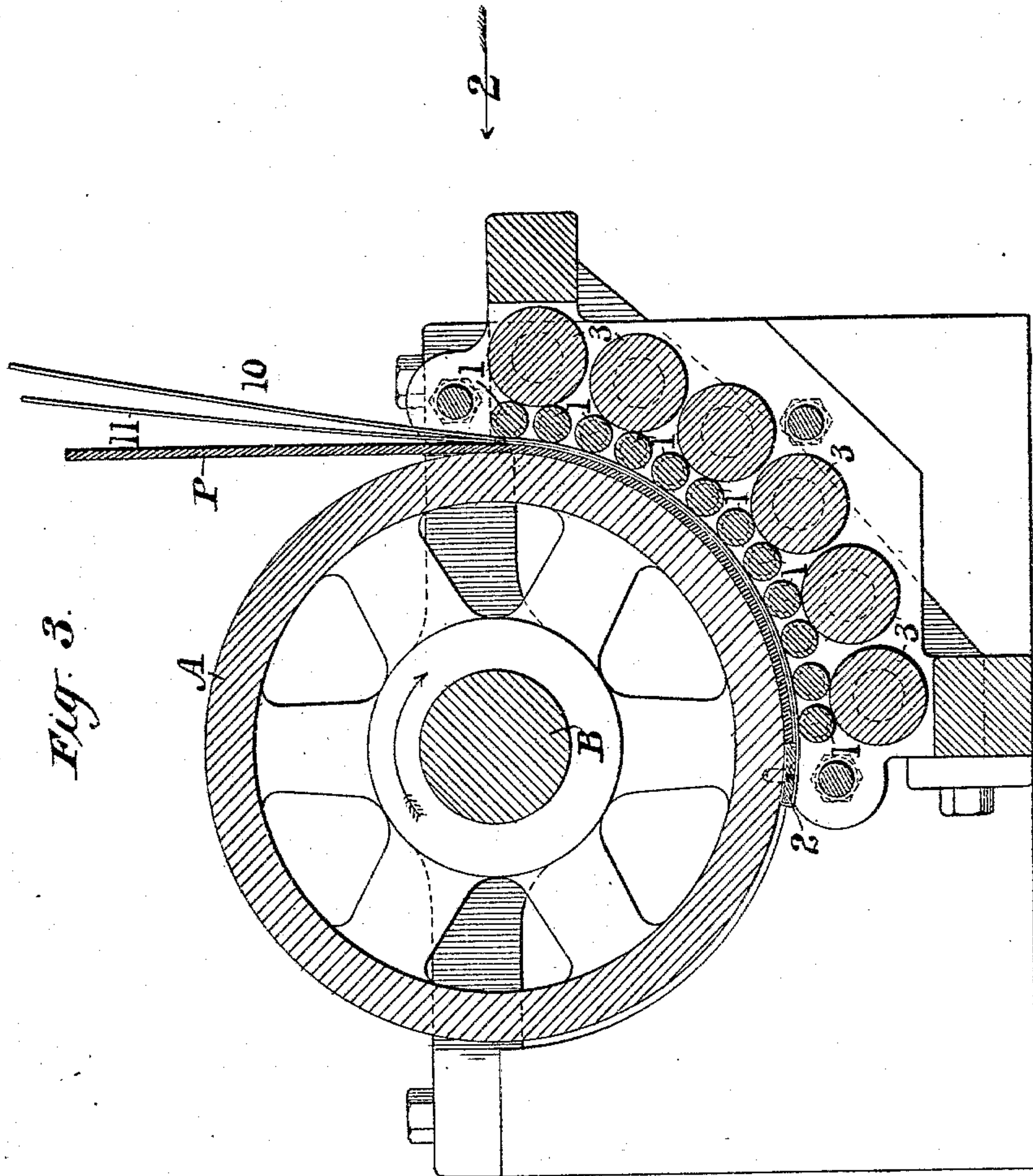
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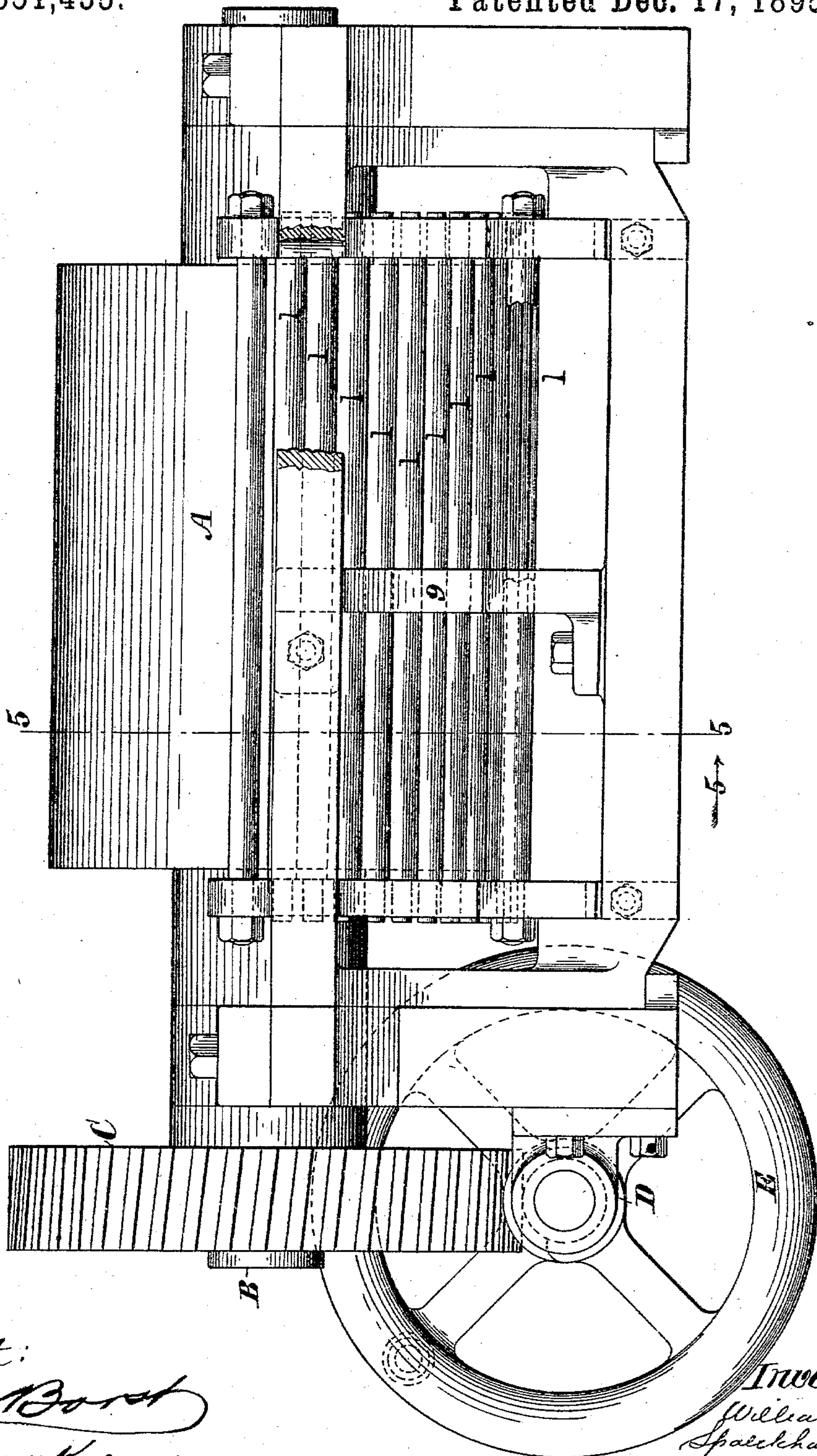
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Fig. 4.



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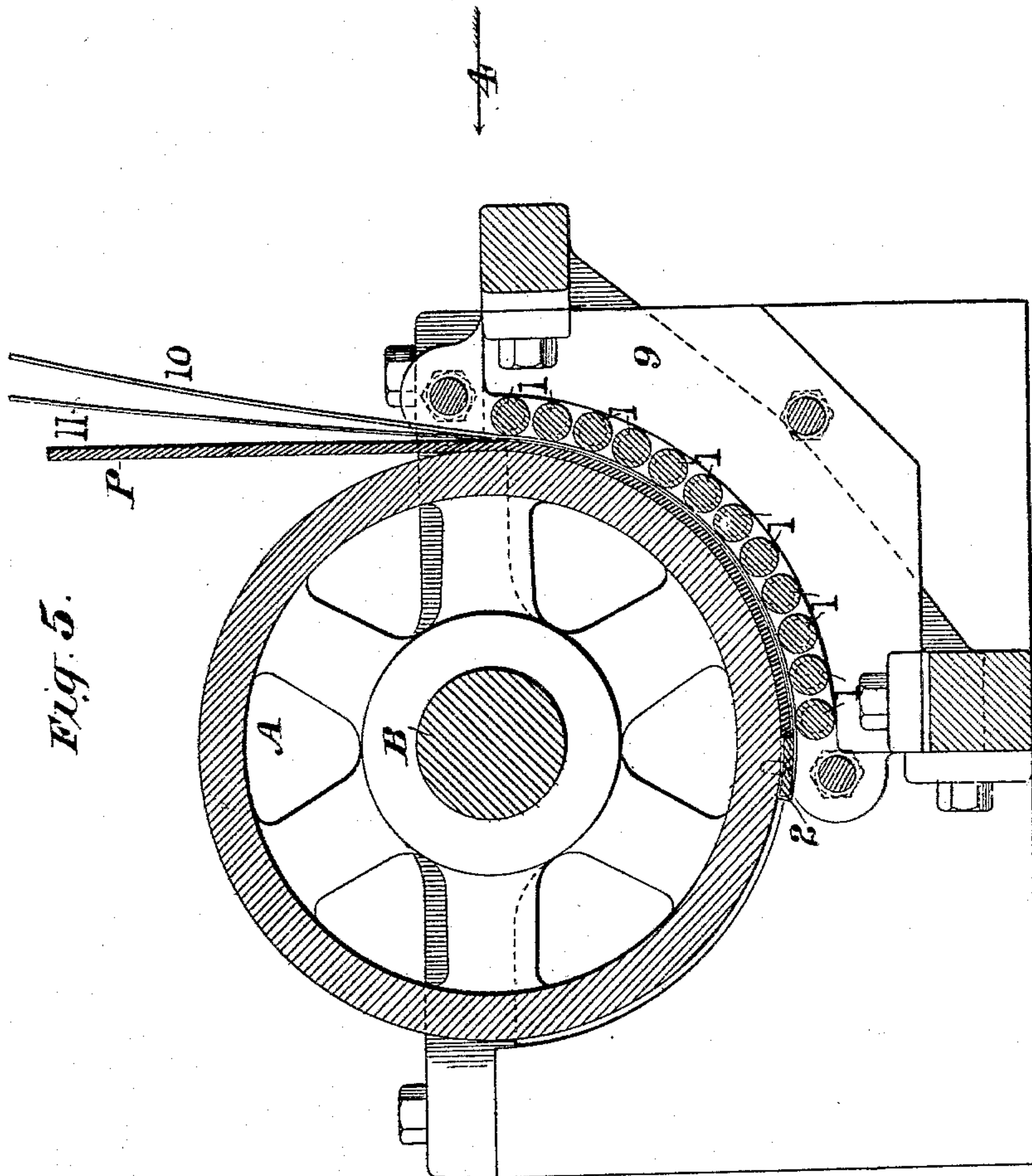
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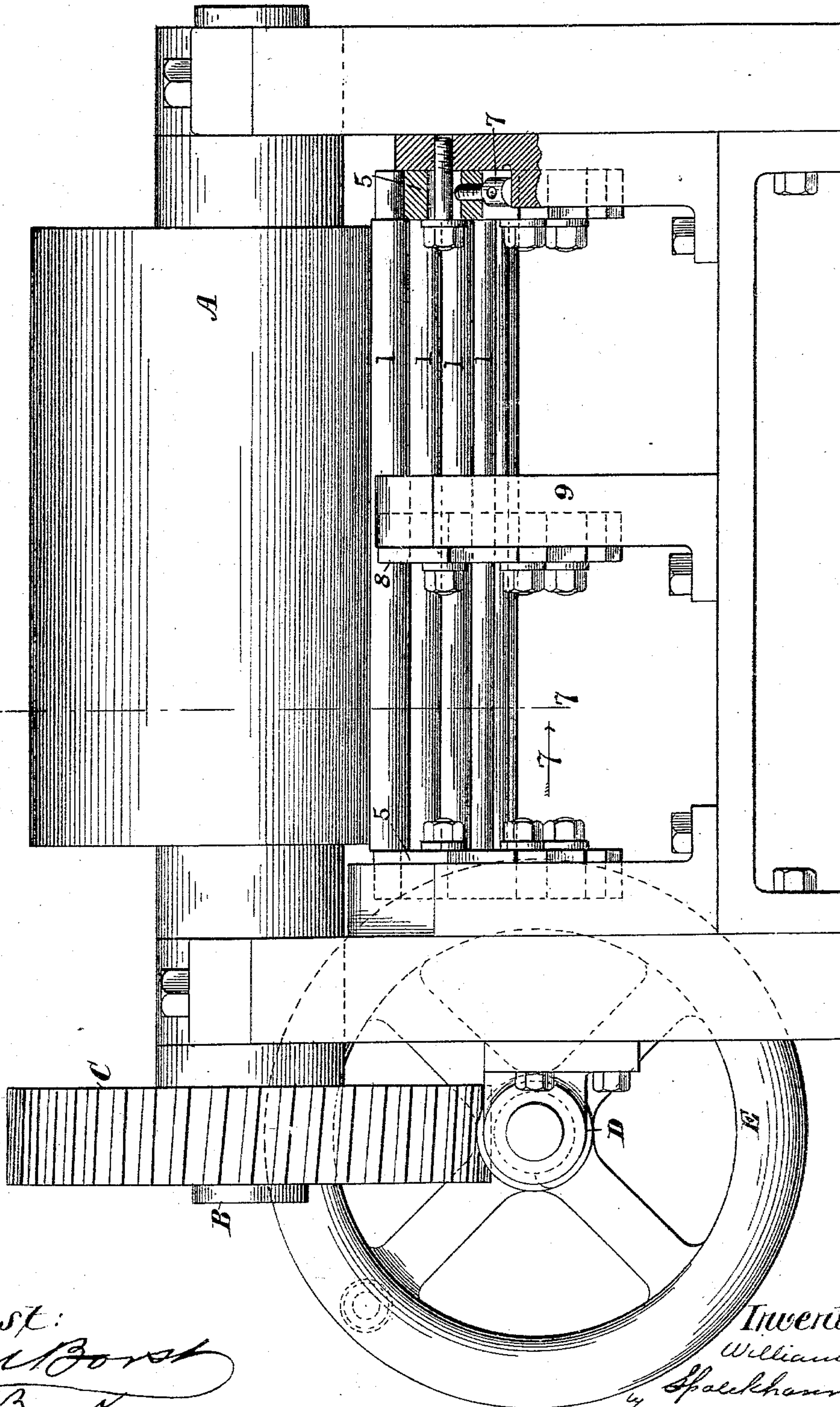
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Fig. 6.



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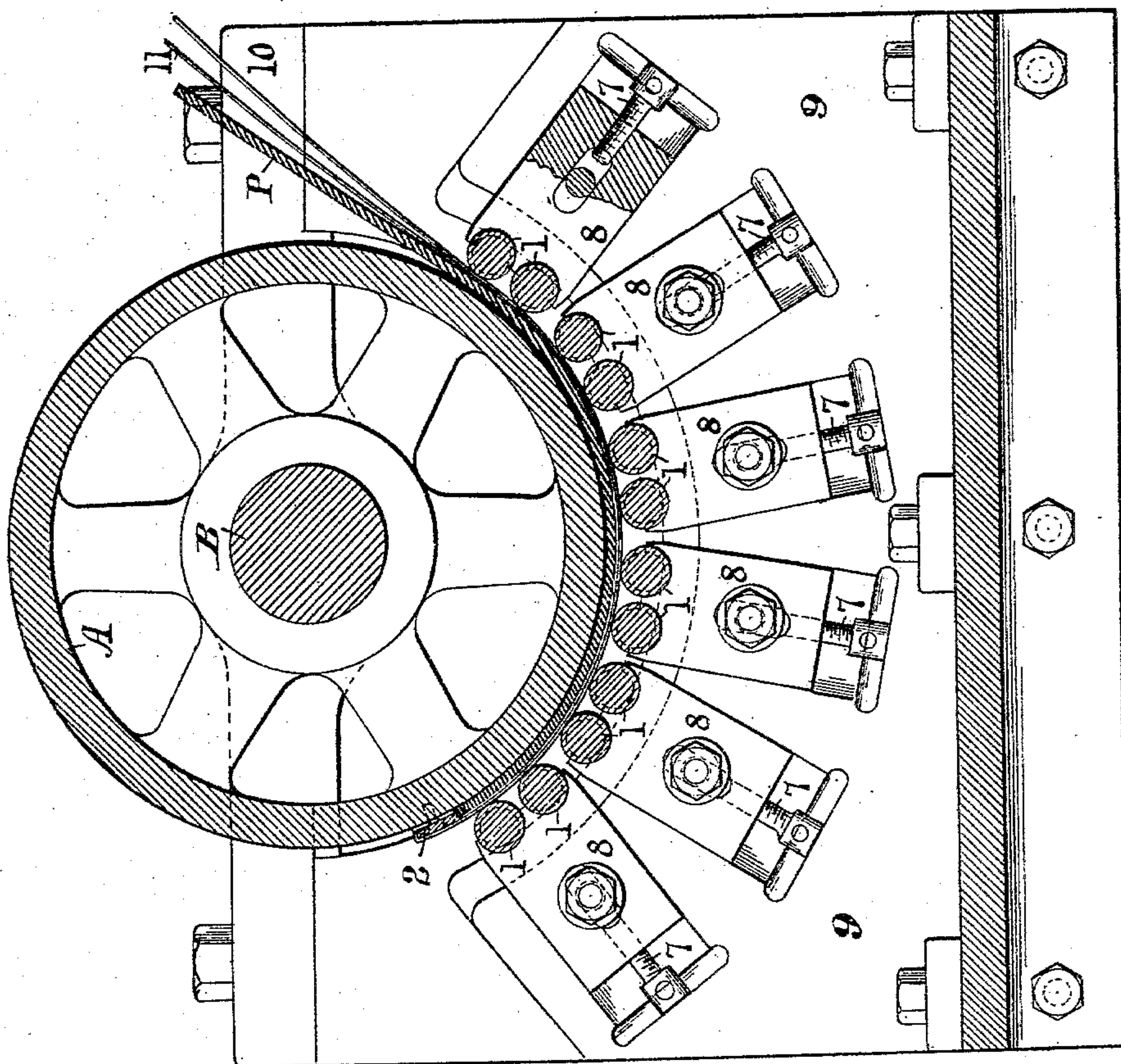
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Fig. 7.



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UNITED STATES PATENT OFFICE.

WILLIAM SPALCKHAVER, OF BROOKLYN, ASSIGNOR TO ROBERT HOE, THEODORE H. MEAD, AND CHARLES W. CARPENTER, OF NEW YORK, N. Y.

PLATE-BENDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 551,455, dated December 17, 1895.

Application filed April 5, 1895. Serial No. 544,538. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM SPALCKHAVER, a citizen of the United States, residing at Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Plate-Bending Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

10 This invention relates to that class of metal-plate-bending machines especially adapted for producing the curvature in printing-plates necessary to adapt the same to fit the periph-
15 eries of printing or form-carrying cylinders of printing-machines.

The invention consists mainly in combining with a plate-carrying cylinder and means for holding a plate thereon, of a closely-associated curved series of small bearing-rollers, and, in addition to their journaled ends, providing supports auxiliary thereto, to insure their continued true relation to the carrying-cylinder during the bending operation.

25 Practical embodiments of this improved bending-machine are illustrated in the accompanying drawings, in which—

Figure 1 is an elevation of the machine as seen looking at its driving end or in the direction of the arrow 1 in Fig. 2. Fig. 2 is a side elevation of the same, with some portions removed to expose others, as seen looking in the direction of the arrow 2 in Figs. 1 and 3. Fig. 3 is a sectional elevation of the same on the section-line 3 and as seen looking in the direction of the arrow 3 in Fig. 2. Fig. 4 is a side elevation of a modification of the machine as seen looking in the direction of the arrow 4 in Fig. 5. Fig. 5 is a sectional elevation thereof on the section-line 5 of Fig. 4 and as seen looking in the direction of the arrow 5 in Fig. 4. Fig. 6 is a side elevation of a further modification of the machine; and Fig. 7 is a sectional elevation of the same, taken at the section-line 7 and as seen looking in the direction of the arrow 7 in Fig. 6.

45 As illustrated, the machines all consist of a plate-carrying cylinder A, mounted upon a shaft B, journaled in the side frames, and provided with means for causing its rotation, as the worm-wheel C and worm D, the shaft of the latter being provided with a hand

or crank wheel E. The plate-carrying cylinder A is of a size that will provide a curved periphery approximately corresponding with that of the supporting-bed with which the plate bent in this machine is to be adapted or upon which it must fit; but as stereotype and electrotype printing-plates when bent from the flat to a curved form spring slightly after being curved, the supporting-cylinder A and the co-operating mechanisms will have a curvature slightly less than that desired in the finished plate.

Arranged in coincident relation with the periphery of the cylinder A, or the arc of travel of the plate-bearing segmental portion thereof, is a curved series of bearing-rollers 1, journaled at their ends and arranged to be frictionally revolved.

The cylinder A is provided with a head-plate 2, securely fixed to its surface, to which head-plate is fastened the end of a drawing-plate 10, which drawing-plate 10 is thin and flexible, and is provided to confine between itself and the surface of the cylinder A the electrotype or stereotype plate P, which is thus carried with the cylinder to be bent into curved form.

The bearing-rollers 1 preferably have supports that are auxiliary to the journals of said rollers, whereby the same are held up to their fixed relation to the arc of travel of the cylinder A. One species of auxiliary supports is found in the rollers 3, each of which is journaled in the framework, so as to have peripheral contact with pairs of the rollers 1. This auxiliary support for this curved series of bearing-rollers 1 may be a curved support or bearer 9, as shown in Figs. 4 and 5, the same being placed midway between the journals of said bearing-rollers, preferably centrally, and operating as a peripheral bearing for each of said rollers.

The printing-plate to be operated upon in this machine may be a stereotype or electrotype, the face of which bears a printing design, as the face of type. Its forward end is laid upon the cylinder A abutting against the plate 2, and the flexible plate or apron 10 is laid over it, an intermediate or protecting sheet 11 of paper being used or not to protect the face of the plate, as may be required.

When the shaft B is moved in the direction of its arrow, the plate P, confined under the apron 10, will be caused to enter between the bearing-rollers 1 and the surface of the cylinder A, and be forcibly drawn onward, being pressed onto the cylinder or segment A as the bearing-rollers are passed, the plate P being thus gradually bent or made to conform to the curved space existing between the said rollers 1, and the cylinder or segment A.

When the shaft B has been rotated far enough to have carried the plate P beyond the bearing-rollers, the apron or plate 10 is raised and the plate P, now curved in an arc approximately that of the cylinder A, is removed for use, and will be found to be adapted to fit its intended seat.

In order to suit the apparatus for use in bending plates of varying thicknesses or composed of metals varying in character, the bearing-rollers 1 are carried in adjustable end and auxiliary bearings, preferably as in Figs. 6 and 7. These end bearings are sliding supporting-blocks 5, each of which has bearings for the journals of two of the rollers 1. So, also, the auxiliary curved support or bearer 9 carries sliding supporting-blocks 8, each of which preferably has a bearing fitting the peripheries of two of the rollers, as shown in Fig. 7. These blocks 8 and corresponding blocks 5 at opposite ends of the rollers 1, having corresponding bearings for the journals of said rollers 1, are adjustable radially in suitable recesses by means of screws 7, so as to accurately adjust said rollers and hold them in exact working positions. Thus the bending mechanisms can be adjusted to suit plates varying in thicknesses or quality and curve them into arcs suited to fit the beds upon which they are to be supported, as the form-cylinders of a printing-machine. The rollers 3, although shown as

extending throughout the length of the rollers 1, need not have this extent, but may be limited to a central bearing-contact with the rollers 1.

The working surface of the carrying-cylinder A is but a segmental part thereof and obviously so much of said surface as is not needed for supporting the plate might be omitted.

What I claim is—

1. The combination with the carrying cylinder A and means for holding a plate thereon, of a curved series of small bearing rollers 1 arranged in close proximity to each other and revoluble in fixed bearings, substantially as described.

2. The combination with the carrying cylinder A and means for holding a plate thereon, of a curved series of bearing rollers 1 journaled at their ends in fixed bearings and having a bearing auxiliary to said journals, substantially as described.

3. The combination with the carrying cylinder A and means for holding a plate thereon, of a curved series of bearing rollers 1 journaled at their ends and having a bearing auxiliary to said journals consisting of rollers 3, substantially as described.

4. The combination with the carrying cylinder A and means for holding a plate thereon, of a curved series of bearing rollers 1 arranged in close proximity to each other, journaled at their ends and pairs thereof having auxiliary supports, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WILLIAM SPALCKHAVER.

Witnesses:

F. W. H. CRANE,
E. L. SPEIR.