

No. 736,835.

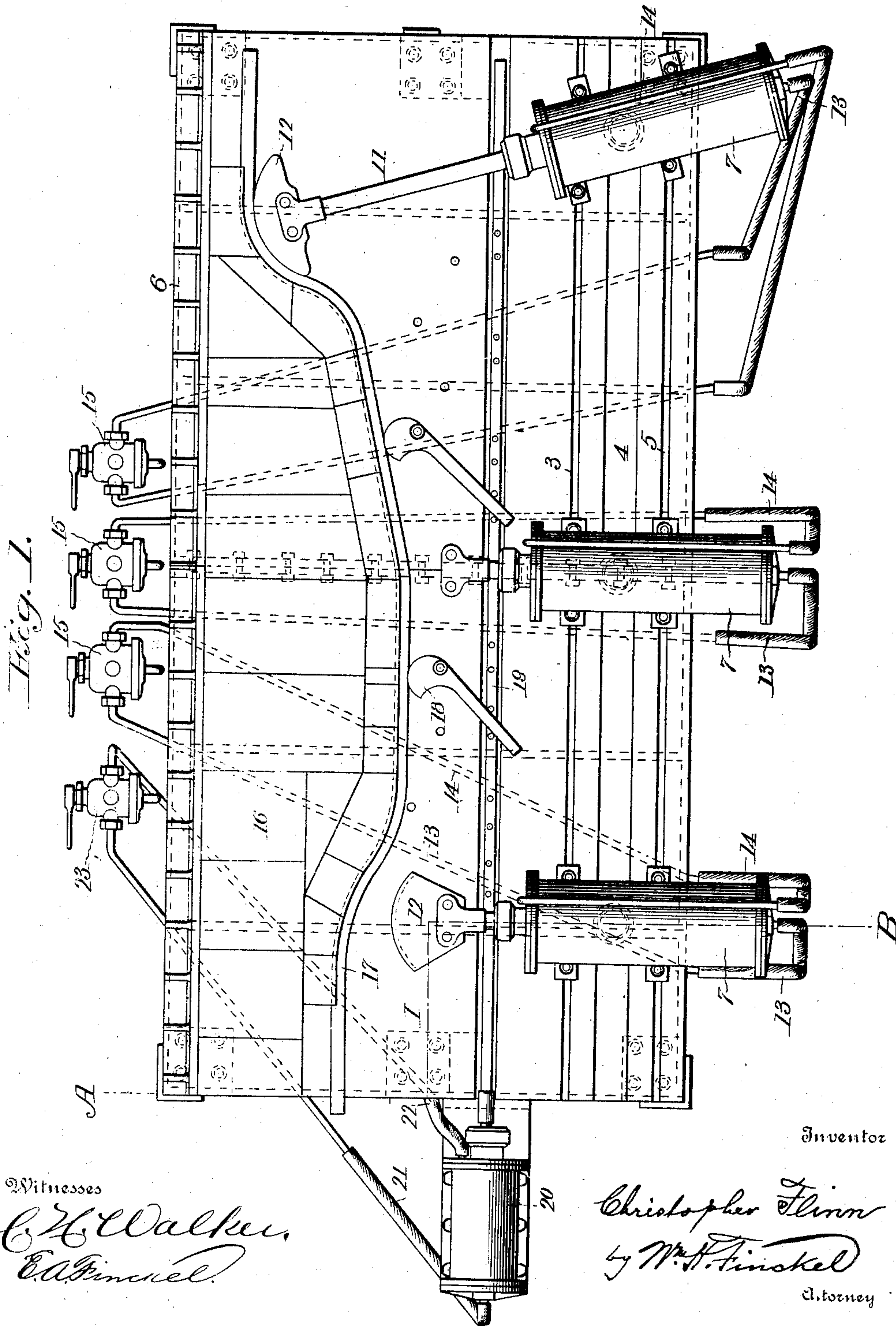
PATENTED AUG. 18, 1903.

C. FLINN.
BENDING MACHINE.

APPLICATION FILED AUG. 16, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



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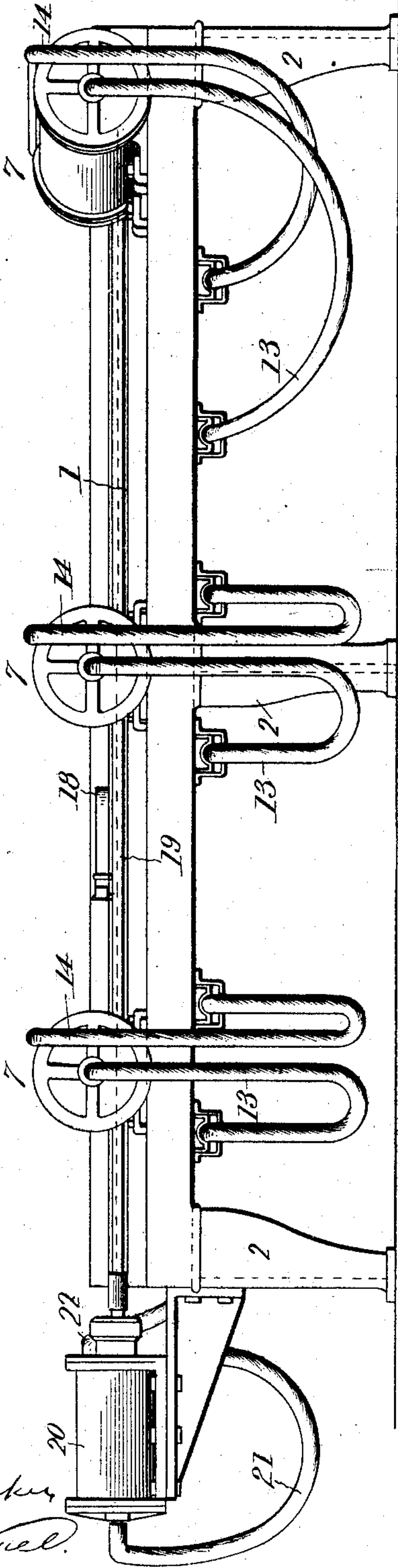
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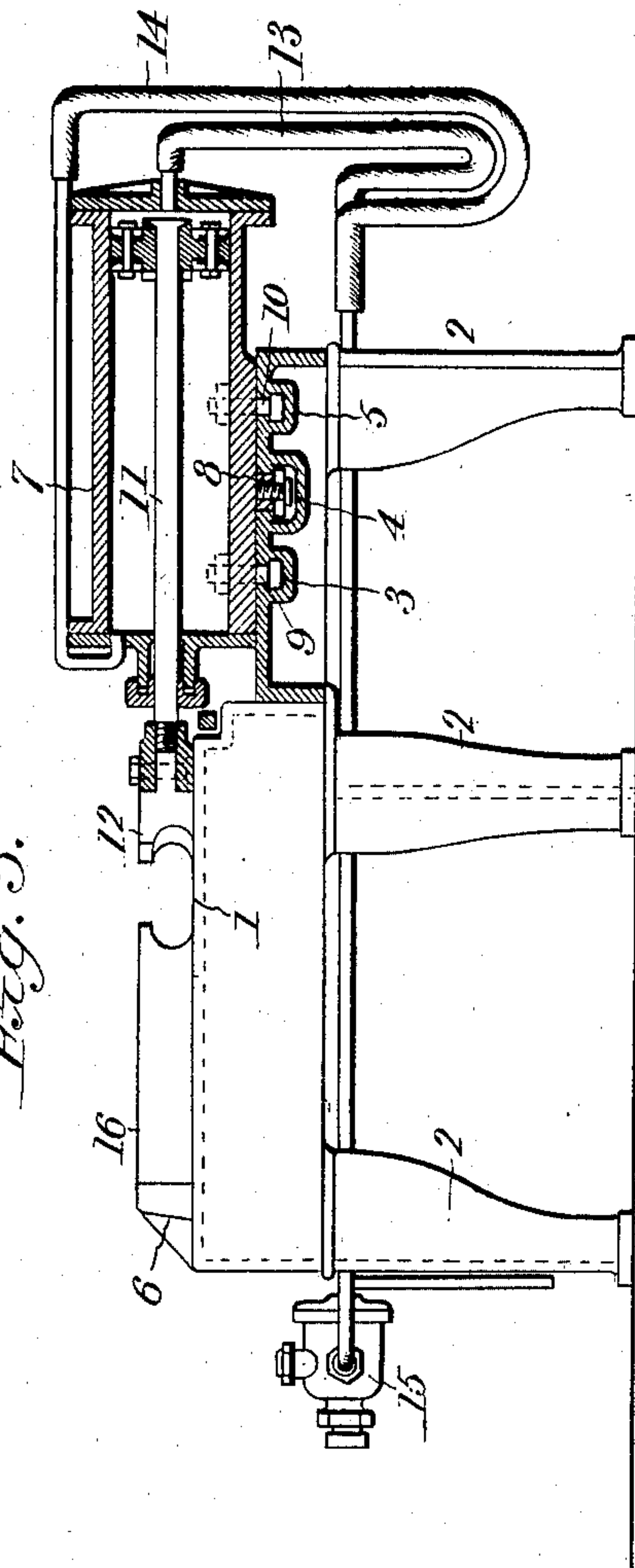
Fig. 2.



Witnesses

W. W. Wacker
E. J. Kinney

Fig. 3.



Inventor

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UNITED STATES PATENT OFFICE.

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A CORPORATION OF NEW JERSEY.

BENDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 736,835, dated August 18, 1903.

Application filed August 16, 1902. Serial No. 119,894. (No model.)

To all whom it may concern:

Be it known that I, CHRISTOPHER FLINN, a citizen of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a certain new and useful Improvement in Bending-Machines, of which the following is a full, clear, and exact description.

The object of this invention is to provide a machine for use in bending bars, pipes, or tubes, and especially parts of this kind that are furnished by car and locomotive builders as part of the equipment, although of course the apparatus may be used for bending generally.

In carrying out my invention I use a table upon which are mounted a series of cylinders or engines containing pistons actuated by pressure, the pistons being provided with formers which coöperate with former-blocks on the table for bending the blank into any desired shape. The engines are adjustable in order that a variety of shapes may be bent. Combined with the table are clutches worked by power to hold the blank upon the former-blocks, although other clamps may be used.

In the accompanying drawings, illustrating my invention, in the several figures of which like parts are similarly designated, Figure 1 is a top plan view. Fig. 2 is a side elevation. Fig. 3 is a cross-section taken substantially in the plane of line A B, Fig. 1.

The table 1 may be mounted upon suitable standards or legs 2, and one end of the table is grooved transversely with undercut grooves 3, 4, and 5, while the opposite end of the table is provided with a head block or blocks 6, it being understood that more than one block may be used in order to facilitate the making of different shapes or to avoid heavy castings. Cylinders 7, preferably three for ordinary work of the class described, are mounted upon the table, and each cylinder has a stud or pivot 8 engaging the undercut groove 4, while adjustable stop lugs or clamps 9 and 10 engage the grooves 3 and 5, respectively, and the cylinder to retain the cylinder in whatever adjusted position it may be given for any desired piece of work. Referring to Fig. 1, it will be seen that the left-hand and mid-

dle cylinders are arranged at right angles to the grooves in order to effect the work that is laid down in that view, while the right-hand cylinder has its axis oblique to the grooves in order to properly perform the work at its end of the table. It is understood that this arrangement may be reversed or that the cylinders may be placed either at right angles or have their axis oblique or in any position that may be necessary in order to properly perform the work to be done by them. Each cylinder has its own piston-rod 11, provided with a former 12 of appropriate shape to the work to be done by it. Each cylinder has its own supply and exhaust pipes 13 and 14, respectively, entering opposite ends of the cylinder and connected with a suitable three-way cock 15, by which the pressure may be controlled, and air at a sufficient pressure, according to the size of the cylinder and the work to be performed, is an efficient power agent for the purposes of the invention, it being understood that, if desired, all cylinders may be operated jointly instead of independently.

The table is supplied with former-blocks 16, abutted against the head-block 6 in any suitable manner in order to make a pattern having the profile of the finished work; but instead of blocks pins or other suitable devices for this purpose may be used, although blocks are preferred. It is also understood that cylinders or engines may be located on both sides of the table and that the head-blocks may be moved in position by the cylinders as the nature of the work should require. The blank 17 is then laid upon the profile member or members and secured thereto in any suitable manner, as by means of clutches 18, pivoted to the table and having their ends engaged by the sliding bar 19, sliding in a way in the table and operated by the piston of a cylinder 20, which likewise may be an air-cylinder, having an air-supply pipe 21 and an exhaust-pipe 22, connected through a cock 23, as indicated by the other cylinders on the machine.

As to all of the cylinders, the three-way cocks, and connecting-pipes, it is to be observed that although I have referred to one set of pipes as "supply-pipes" and the other

as "exhaust-pipes" it is obvious that these pipes alternate in their function and while one is supplying the other is exhausting.

5 The apparatus hereinabove described is designed to bend objects cold, although of course they may be heated.

Of course instead of the power-clutches 18 other means may be used for securing the blank to its receiving-bed, or clutches otherwise operated may be used, or pins or other
10 suitable clamping devices for holding the blank in position while being acted upon may be used.

15 The pipes for controlling the pressure in the cylinders may be wholly or partly flexible in order to admit of the adjustment of the cylinders.

If the machine is to be used for bending a variety of shapes, the bed of former-blocks is
20 made variable and the engines or motors (represented by the pressure-cylinders and their pistons) will be adjustable as shown, and any number of them worked simultaneously; but if the machine is designed to
25 bend a single form then a fixed bed and fixed engines may be used.

What I claim is—

1. A bending-machine, comprising a table, having a receiving-bed upon which a blank is laid, and former-blocks of the contour to which the blank is to be bent, a number of engines, each having a former, and each pivotally applied to the table so as to present its former at the desired angle to the work, independent means for adjusting each engine
35 lengthwise of the table, and means for operating said engines jointly or independently of each other.

2. A bending-machine, comprising a table, having a receiving-bed, a number of engines
40 applied to the table, means for operating them jointly or independently of each other, and each having a former adapted to the work to be performed by it, clutches for holding the work to said bed, and means for applying and
45 releasing all of said clutches simultaneously.

In testimony whereof I have hereunto set my hand this 13th day of August, A. D. 1902.

CHRISTOPHER FLINN.

Witnesses:

CHAS. D. JENKS,
J. H. HACKENBURG.