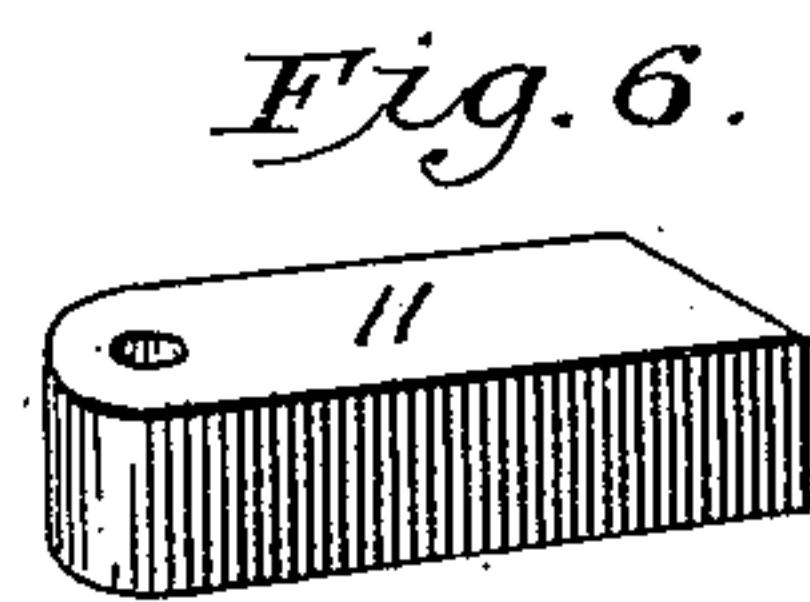
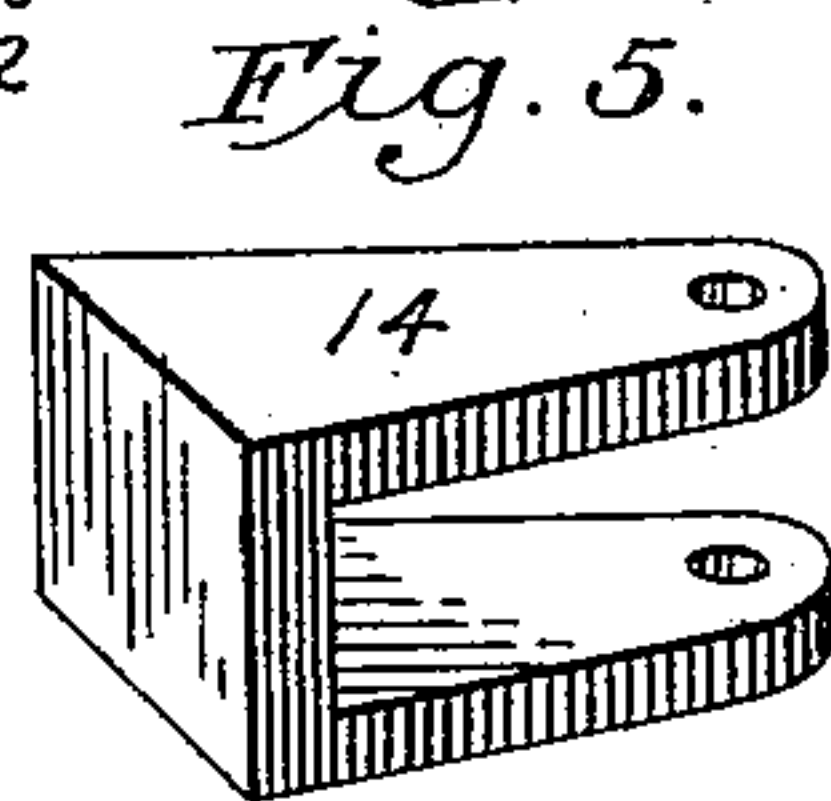
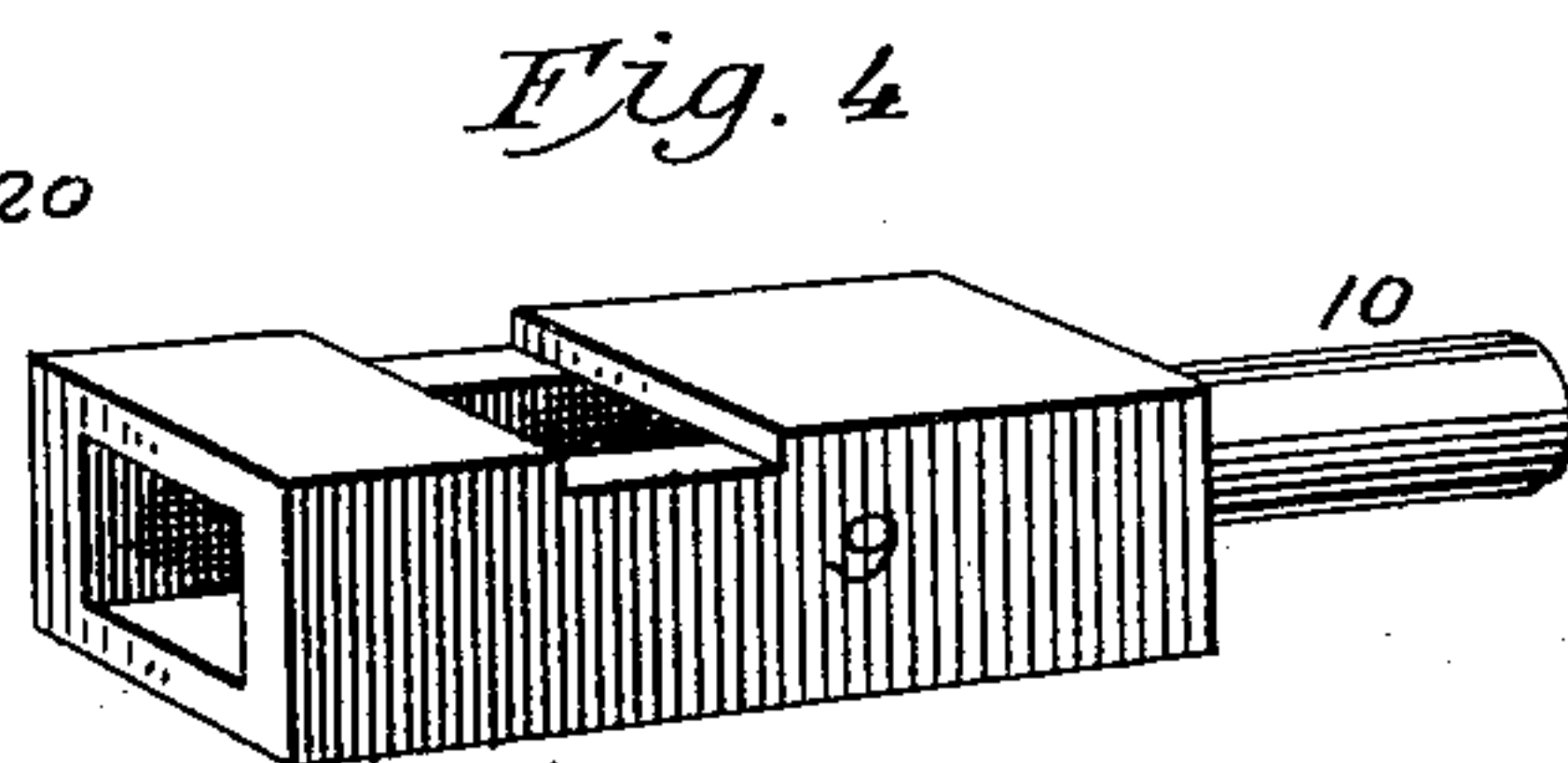
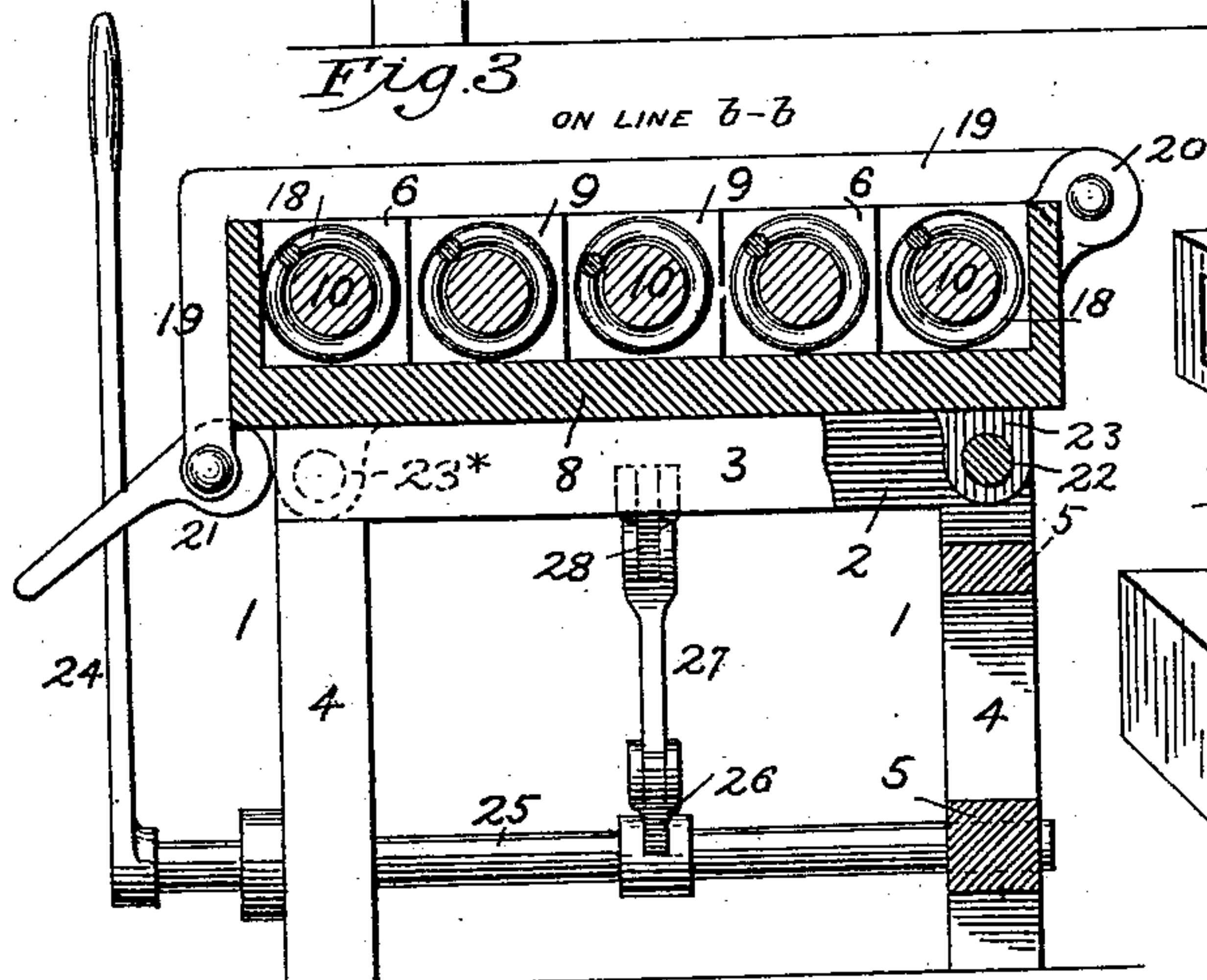
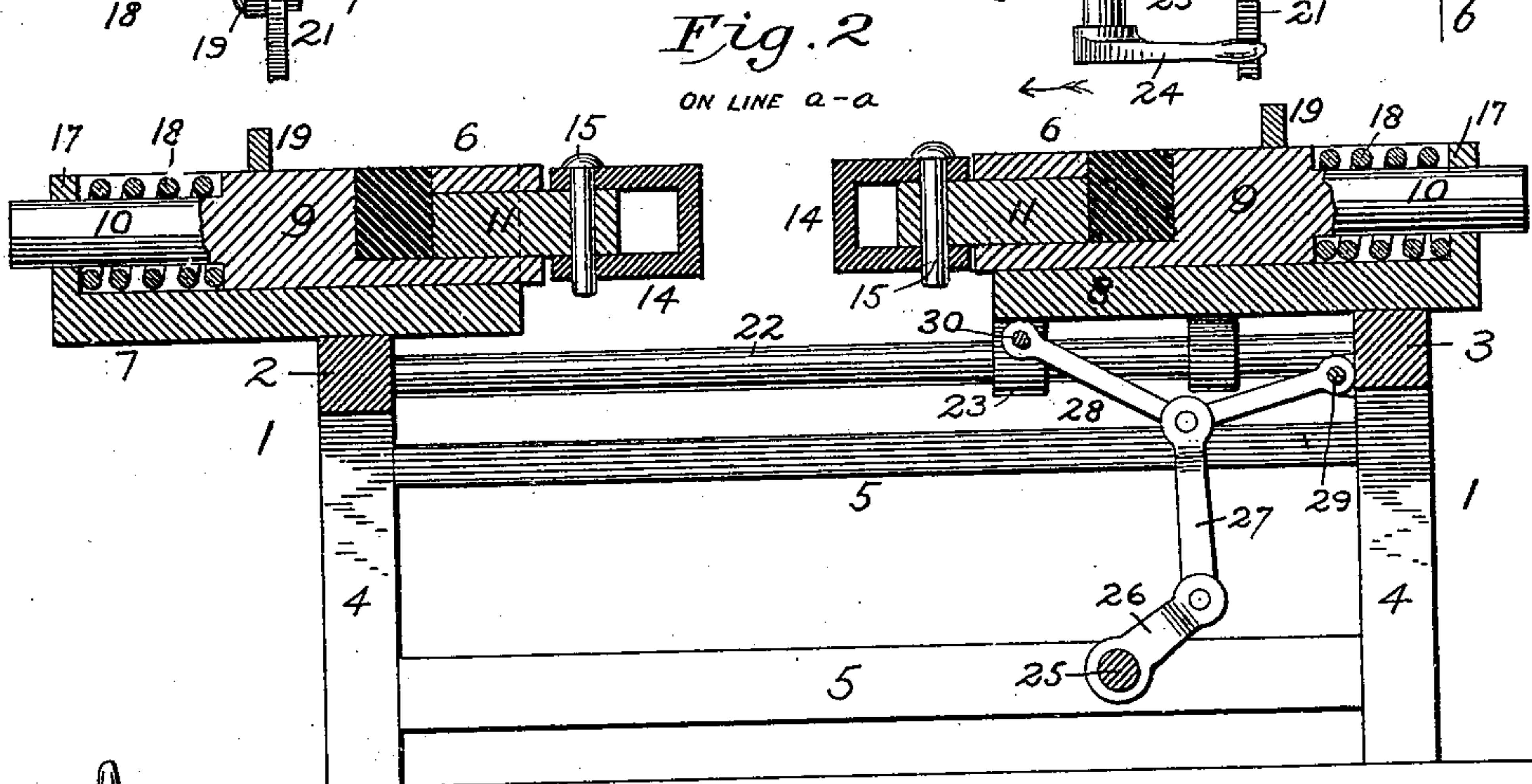
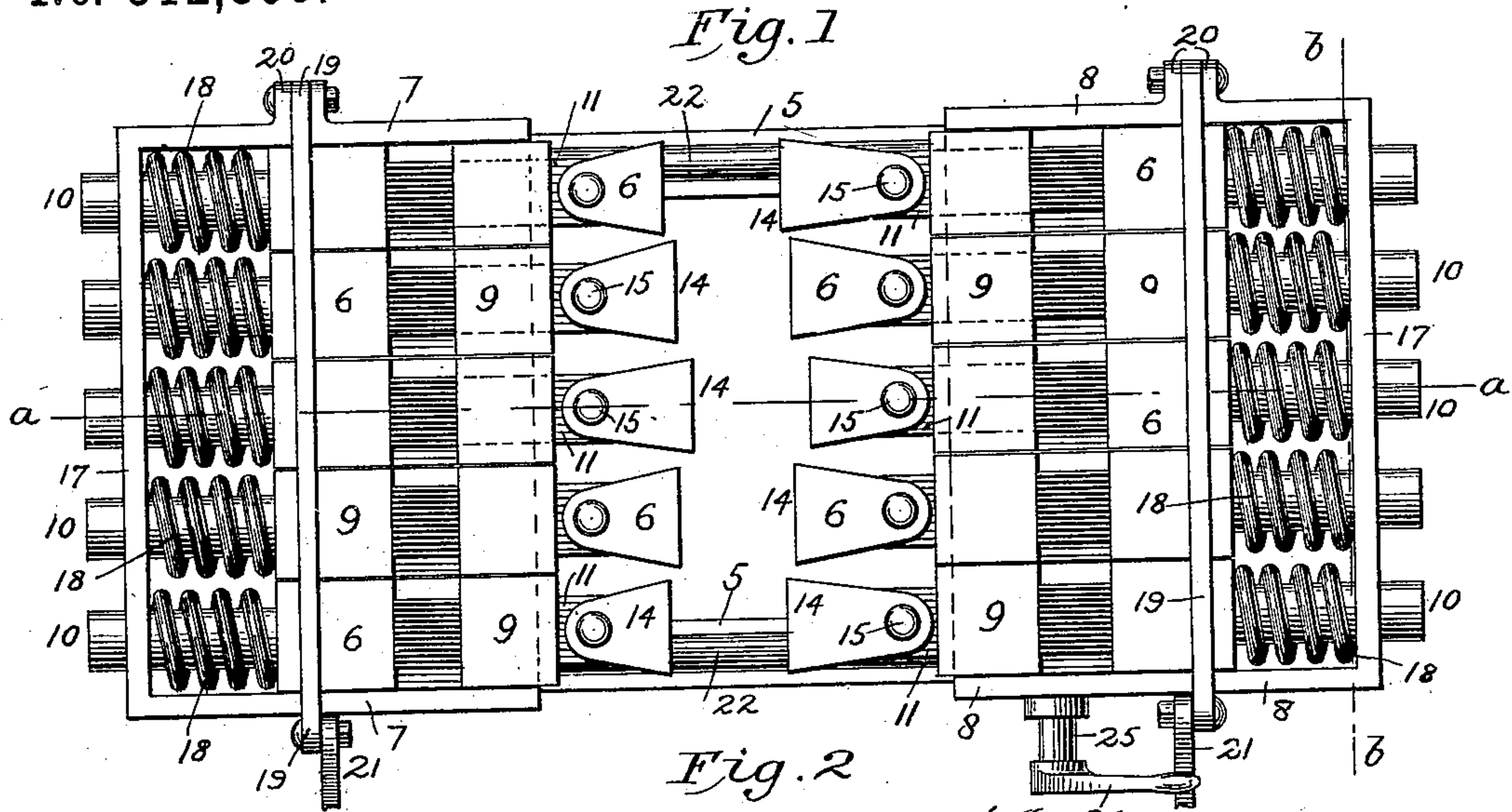


(No Model.)

D. R. COWAN.
BENDING MACHINE.

No. 512,366.

Patented Jan. 9, 1894.



Witnesses,
Sidney P. Hellingworth
Fabius S. Elmore

Inventor,
David R. Cowan
by his attorney,
P. T. Lodge

UNITED STATES PATENT OFFICE.

DAVID R. COWAN, OF MOLINE, ILLINOIS.

BENDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 512,366, dated January 9, 1894.

Application filed March 15, 1893. Serial No. 466,041. (No model.)

To all whom it may concern:

Be it known that I, DAVID R. COWAN, of Moline, county of Rock Island, and State of Illinois, have invented a new and useful Improvement in Bending-Machines, of which the following is a specification.

My invention relates to that class of bending machines for bending wood, iron or other material in which two series of opposing independently adjustable heads are employed, the object to be bent being acted on between the two series of heads.

My invention consists in various improvements in machines of this character relating more particularly to the form and construction of the individual heads, the manner of mounting and adjusting them, the connections and means for moving one series with relation to the other, and in various other details; whereby the machine as a whole is rendered simple and durable, and its operation perfect and effective.

My invention also consists in the details of construction and combination of parts hereinafter described and claimed.

In the accompanying drawings, Figure 1, is a top plan view of my improved machine. Fig. 2, is a central longitudinal sectional elevation of the same on the line *a—*a**. Fig. 3, is a transverse section on the line *b—*b**, of Fig. 1. Figs. 4, 5, and 6 are perspective views of the parts of one of the heads separated.

Referring to the drawings, 1 represents a rectangular frame or bed which may be of any appropriate material, consisting of two transverse horizontal bars, 2 and 3, sustained by legs 4, which are connected by longitudinal bars or braces 5. At one end of the frame, a series of horizontal independently adjustable heads 6 are mounted in a sustaining frame 7, which is seated and secured upon the bar 2 of the frame, while at the opposite end a similar series of heads are mounted in a longitudinally moving frame 8, the arrangement being such that this latter frame may be moved toward the heads in the opposing frame, the object to be bent whether of wood, iron or other material being subjected to pressure between the two series of heads. Each of the heads comprises a body 9, recessed in its forward end and provided at its rear end with a tenon 10. The recess is adapt-

ed to receive a block 11, the forward projecting end of which is embraced between two ears extending rearward from a shoe 14, the ears being connected to the block by means of a vertical pin 15, extending loosely through the same and the block. In the rear of the block within the recess, a cushion of rubber or equivalent material is applied, which is adapted to act with a cushioning effect to relieve the end pressure to which the shoes are subjected during the operation of the machine. These heads are mounted side by side in their sustaining frames, the shoes of each series opposing each other, and the tenons extending loosely through a series of openings formed in vertical flanges 17 at the outer ends of the frames. A series of spiral springs 18, encircle the tenons, and bear at their ends against the body portions of the heads and the vertical flanges, and serve to project the heads normally forward.

Under the foregoing construction, it will be seen that the individual heads of the two series are movable independently in a longitudinal direction, so that they may be placed in different positions according to the nature of the curve it is desired to give to the object to be bent.

In order that the heads may be securely held in position after being set, I provide the frames 7 and 8 with two transverse clamping bars 19, which are pivoted at one end on horizontal axes between ears 20, fixed to the upper edges of the frames, the construction being such that the bar may be moved upward clear of the heads, or placed horizontally in engagement therewith to hold the same. The opposite ends of the clamping bars are bent at right angles to extend along the vertical sides of the frames, and are provided with locking cams 21, mounted on horizontal axes, and adapted to engage beneath the edges of the frames and draw the clamping bars forcibly down upon the upper sides of the heads. As before stated the frame 8 sustaining one of the series of heads is movable longitudinally. In order that the frame may be caused to move in a true horizontal plane and with certainty, I extend between the two end bars 2 and 3, at opposite sides of the main frame, two longitudinal guide rods 22, and secure to the under side of the frame

8 at opposite sides, two lugs 23 and 23*, provided with openings to receive the bars, so that the frame may move back and forth thereon, its rear end during such movement being sustained upon and guided by the end bar 3 of the main frame. The frame 8 is moved back and forth when desired by an upright hand lever 24, which has its lower end fixed to a rock shaft 25, mounted between the said bars 5. To the rock shaft at its center is fixed an arm 26, the end of which is pivoted to the lower end of a link 27, having its opposite end jointed to toggle links 28, which in turn have their outer ends mounted loosely on two transverse rods 29 and 30 fixed respectively to the end bar 3, and between the lugs 23 on the frame 8. From this it will be seen that by moving the hand lever in the direction indicated by the arrow in Fig. 1, the link 27 will be caused to move upward, which action will tend to straighten out the toggle links, and cause the frame 8 to advance toward the fixed frame 7.

In certain cases according to the nature of the object to be bent or the character of the material, I find it necessary to change the shoes on the forward ends of the heads. This may be effected by simply removing the vertical connecting pins, when the new series of shoes may be applied and secured in a like manner.

Having thus described my invention, what I claim is—

1. In a bending machine the combination with a sustaining frame, of two series of opposing independently adjustable yielding heads, and means for changing their relations to vary the distance between their opposing ends.

2. In a bending machine the combination with a frame, of a series of independently movable heads mounted therein, means tending normally to project said heads forward, and suitable means for locking them in fixed relations.

3. In a bending machine, the combination with a sustaining frame provided with a vertical flange having openings therein, of a series of independently movable heads sustained side by side in said frame and provided with tenons extending through the openings in the flange, and spiral springs encircling said tenons and bearing at one end against

the heads and at the opposite end against the flange, substantially as described.

4. In a bending machine the combination with a frame, of a series of independently movable heads sustained thereby and arranged side by side, a clamping bar pivoted at one end to the frame and extending transversely of the heads and adapted to engage the same, and means for locking said bar in engagement with the heads.

5. In a bending machine, the combination of a sustaining frame, a series of heads lying side by side and movable independently, a transverse clamping bar pivoted at one side of the frame and adapted to engage the heads, and a locking device carried by the bar and arranged to engage the opposite edge of the frame, substantially as described.

6. In a bending machine a series of bending heads each comprising a body portion recessed in its forward end, a block seated in said recess and extending beyond the body portion, an intermediate cushion, and a shoe connected to the extended end of the block.

7. In a bending machine, the combination of the fixed sustaining frame, the series of longitudinally adjustable heads mounted therein, the movable frame, the series of longitudinally adjustable heads carried by said movable frame, the toggle links connected respectively to the movable frame and main frame, the link 27 pivoted to the toggle links, the hand lever, and suitable connections between said hand lever and the link 27, substantially as described.

8. In a bending machine, the combination with the main frame, the sustaining frame mounted thereon, a series of independently adjustable heads mounted side by side in said sustaining frame, the movable frame 8, the series of independently adjustable heads carried thereby, the longitudinal guide rods, the lugs attached to the movable frame and provided with openings to receive the guide rods, and means for moving said frame at will, substantially as described.

In testimony whereof I hereunto set my hand, this 6th day of February, 1893, in the presence of two attesting witnesses.

DAVID R. COWAN.

Witnesses:

J. B. SNYDER,
CHAS. J. DUNN.