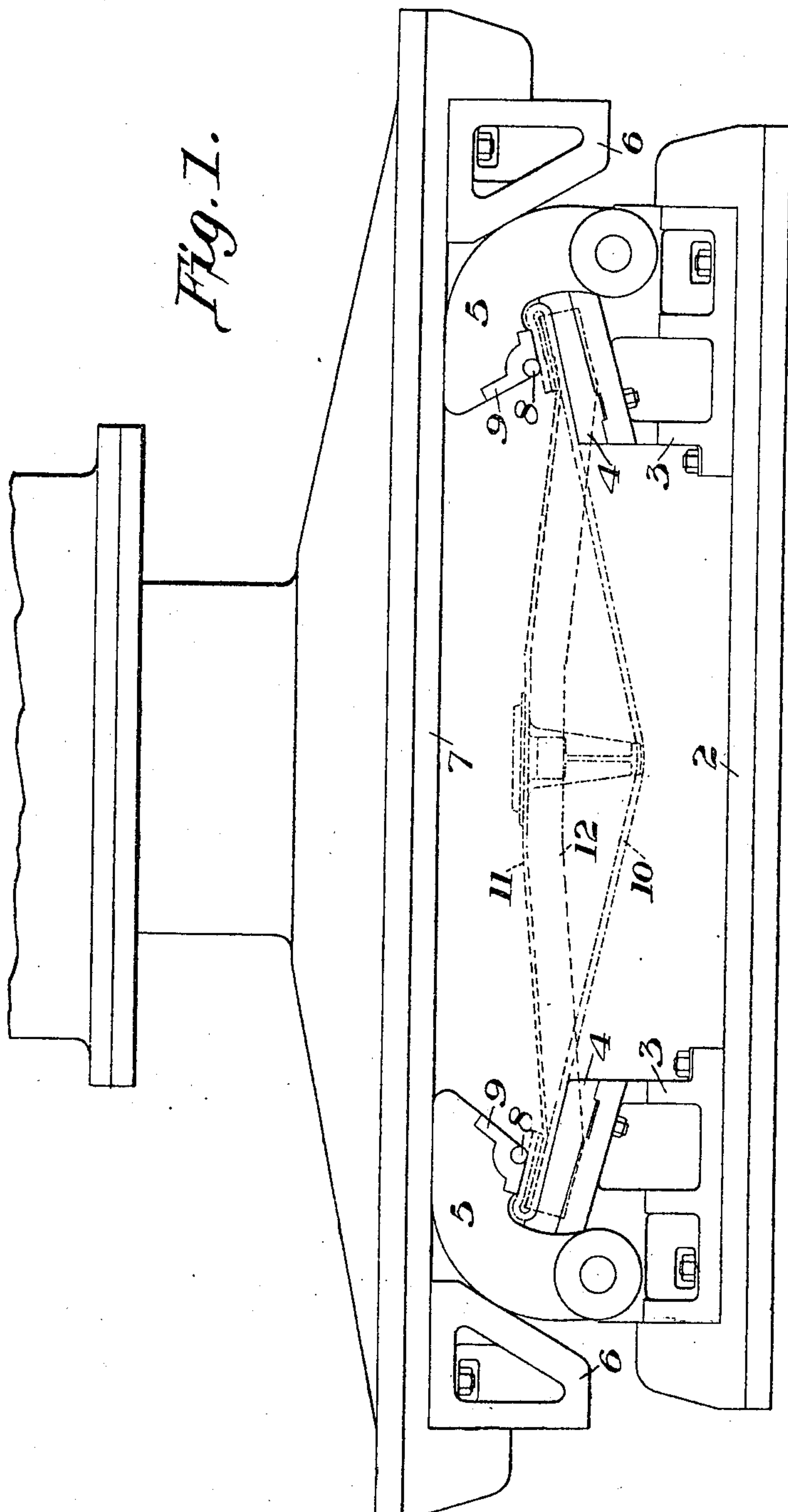


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F. DITCHFIELD.
BENDING APPARATUS.
APPLICATION FILED FEB. 27, 1907.

Patented Dec. 21, 1909.
2 SHEETS—SHEET 1.



WITNESSES

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R. A. Balderson

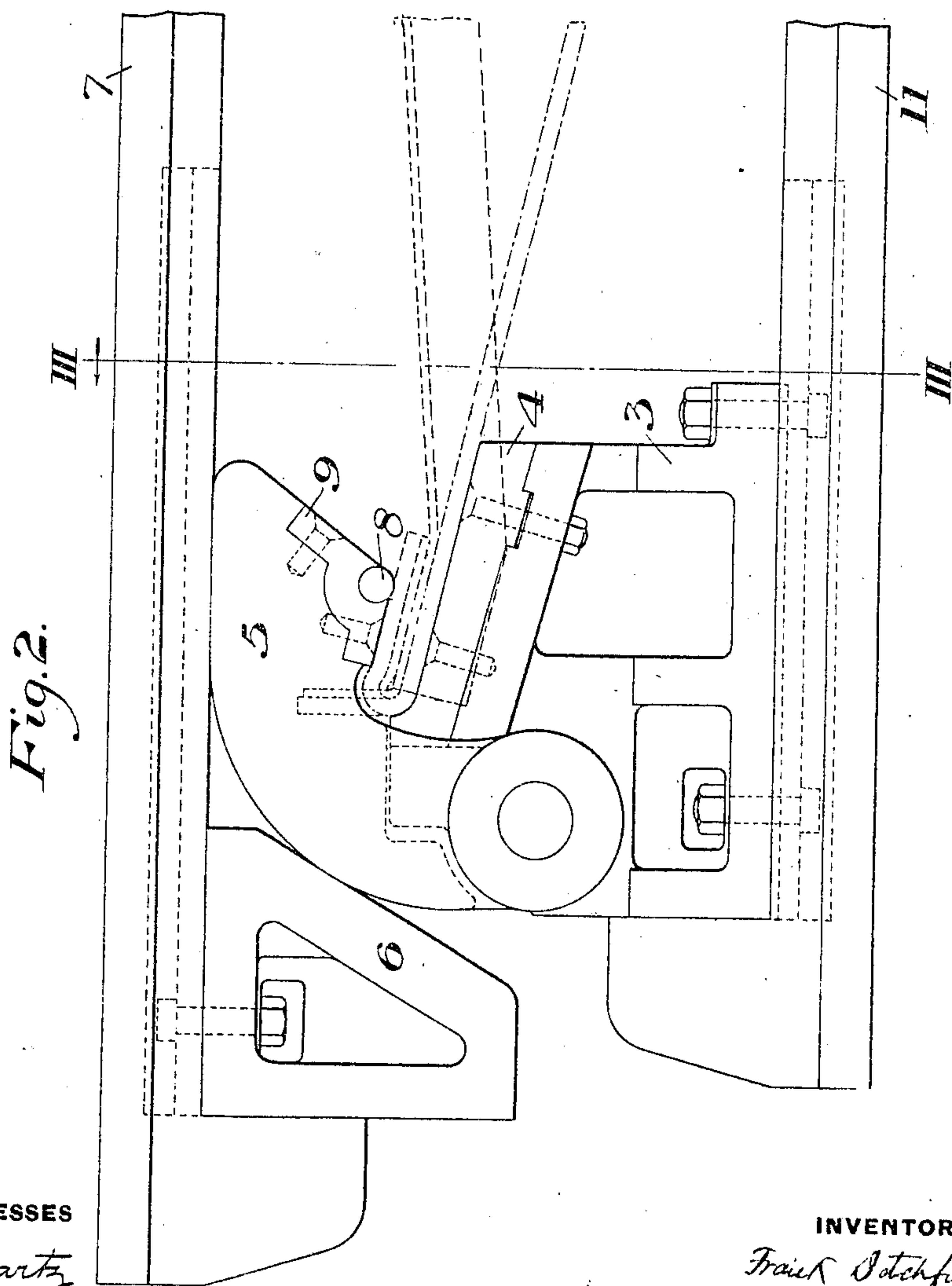
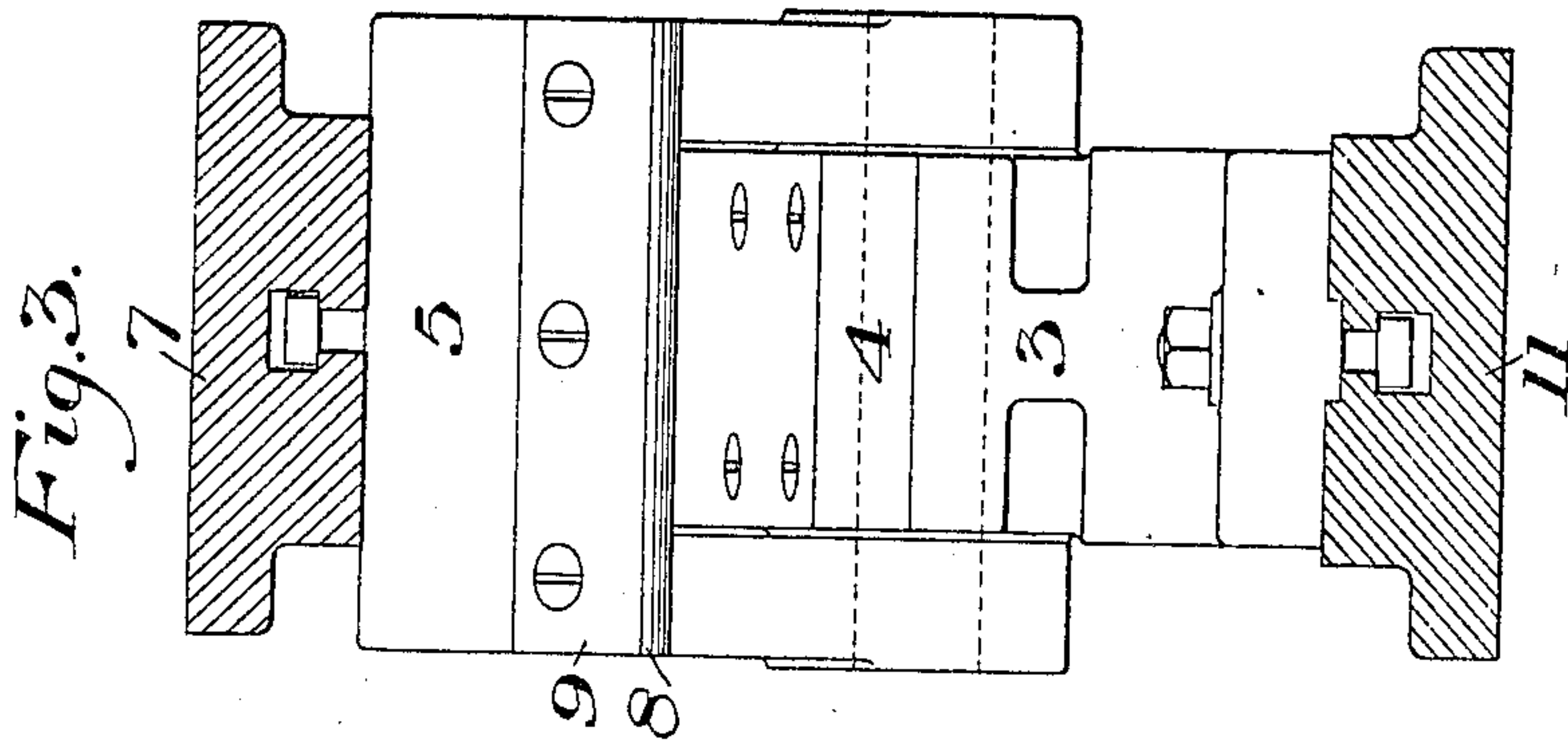
INVENTOR

Frank Ditchfield
by R. A. Balderson & Dymco
his attys

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WITNESSES
W. W. Swartz
R. A. Balderson

INVENTOR
Frank Ditchfield
by Paul R. H. & Co. Inc.
Attorneys

UNITED STATES PATENT OFFICE.

FRANK DITCHFIELD, OF BELLEVUE, PENNSYLVANIA, ASSIGNOR TO PRESSED STEEL CAR COMPANY, OF PITTSBURG, PENNSYLVANIA, A CORPORATION OF NEW JERSEY.

BENDING APPARATUS.

943,967.

Specification of Letters Patent.

Patented Dec. 21, 1909.

Application filed February 27, 1907. Serial No. 359,547.

To all whom it may concern:

Be it known that I, FRANK DITCHFIELD, of Bellevue, Allegheny county, Pennsylvania, have invented a new and useful Bending Apparatus, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a front elevation showing my improved apparatus with the parts in place at the end of the bending operation; Fig. 2 is an enlarged partial detail view similar to Fig. 1; and Fig. 3 is a cross-section on the line III—III of Fig. 2 looking toward the left.

My invention relates to apparatus for bending or doubling back the end portions of the tension members or both the tension and compression members of bolsters, brake beams, and similar articles.

Heretofore one end portion of the tension member has been heated and bent over by hand, and the other end then heated and similarly bent over by hand operation. These operations have been difficult and expensive, and have materially added to the cost of such articles.

My invention is designed to provide a simple and efficient apparatus by which both ends of the tension member, or both ends of the tension and compression members may be simultaneously bent over, while the metal is cold if desired.

In the drawings, 2 represents one press member having adjustably bolted thereto near its ends the die blocks or supports 3. These blocks may be cored out for lightness and for bolt head positioning; and bolted to these blocks are the inclined die wearing pieces 4 which may be made separate as shown or integral with the blocks 3. To the outer portions of the blocks 3 are hinged or pivoted the swinging bending dies 5, 5 having curved outer faces arranged to be engaged by the inclined faces of cam or die blocks 6 secured to another press member 7. These swinging bending dies 5 act to bend over and double back the ends of the parts operated upon, when the press members 2 and 7 are forced toward each other; and to reduce the friction of bending I preferably employ rollers 8 in the nose of each swinging die block 5, and also preferably support this roller in a removable die part 9 which is bolted or otherwise fastened to the swinging

die block. The various die blocks are preferably made adjustable so that they may be employed to bend members of different widths and lengths, and also to provide a take-up for wear.

The apparatus may be used either where the ends of the tension member are bent around the ends of the compression member, or where both the ends of the compression and tension member are folded or doubled back together.

In the drawings, I have shown the apparatus as used for bending bolster parts, 10 being the tension member and 11 the compression member having side flanges 12. The ends of both members are bent back simultaneously, giving substantially the form shown in the drawings. The rivet holes for these end portions may be made previous to bending, and the bending may be carried out while the metal is either hot or cold, but preferably while cold. The bending will bring the previously made rivet holes into alinement in the four layers shown, thus avoiding the necessity for drilling the holes after the bending operation. The end portions of both members are bent so that they extend vertically as indicated in dotted lines in Fig. 2, before they are inserted in the press. The mere movement of one press member toward the other then bends the parts together to form the joint.

The advantages of my invention will be apparent to those skilled in the art. As both end joints are bent simultaneously, the end thrust consequent upon the bending operation at one end will react against that at the other end, thus absorbing such thrust. Both ends are bent simultaneously, and the operation may be carried out while the metal is cold, thus saving any reheating, and carrying out the operation rapidly and cheaply. The use of end fillers is avoided where both the tension and compression members are folded or doubled back together. In such case also these members fit neatly against each other in the doubled back portion, owing to their both being bent simultaneously and under great pressure.

Many variations may be made in the form and arrangement of the die members, the swinging blocks, etc., and either or both press members may be moved in carrying out the bending. It is also obvious that the member or members at the two ends of the

bolsters or other articles operated upon, do not necessarily have to be bent simultaneously, as each end of the article may be bent separately if so desired.

5 I claim:—

1. In a bending machine, a press member, a rigid and a movable die adjustably mounted on said member and a second press member adapted to operate said movable die.

10 2. In a bending machine, a press member, a die block or support adjustably mounted on said member, a rigid die and a movable die mounted on said block or support, and a second press member for operating said

15 movable die.
3. In a bending machine, an adjustably mounted die block or support, a rigid die and a movable die mounted thereon and adjustable means for operating said movable

20 die.
4. In a bending machine, an adjustably mounted die block or support, a movable die mounted thereon, a press member and an adjustable cam for operating said die,

25 mounted thereon.
5. In a bending machine, a press member, a die block or support adjustably mounted thereon, a rigid die and a movable die mounted on said block or support, a second

30 press member and a cam adjustably mounted on said second press member for operating said movable die.
6. In a bending machine, a press member, a block adjustably mounted on said press

35 member, a rigid and a movable die mounted on said block, and a second press member for operating said movable die.
7. In a bending machine, a press member, a pair of blocks mounted on said press mem-

ber adjustable with relation to each other, a 40 rigid and a movable die carried by each of said blocks and a press member for operating said movable dies.

8. In a bending machine for bolsters having return bends in their ends, a rigid die 45 for supporting the end of the bolster, a movable die pivoted below and at the end of said rigid die and projecting upwardly and forwardly out over the rigid die when in pressing position, said movable die also hav-

50 ing an angular engaging face.
9. In a bending machine for bolsters having return bends in their ends, a rigid die for supporting the end of the bolster, a 55 movable die pivoted below and at the end of said rigid die and projecting upwardly and forwardly out over the rigid die when in pressing position, said movable die also having an angular engaging face and an anti-

60 friction roller mounted at the apex of said engaging face.
10. In a bending machine for car bolsters, an elongated press member formed with slots, die blocks adjustably mounted in said 65 slots, a rigid die on each of said blocks each adapted to support an end of a bolster, a movable die pivoted below and at one end of each of said rigid dies and projecting over said rigid dies when in pressing position, a second press member and adjustable 70 cams carried by second press member for operating said movable dies.

In testimony whereof, I have hereunto set my hand.

FRANK DITCHFIELD.

Witnesses:

CHALLIS BOWKER,
J. V. MAHER.