J. OLSON.

BENDING AND STRAIGHTENING MACHINE.

APPLICATION FILED MAR. 15, 1909.

963,636.

Patented July 5, 1910.

2 SHEETS—SHEET 1.

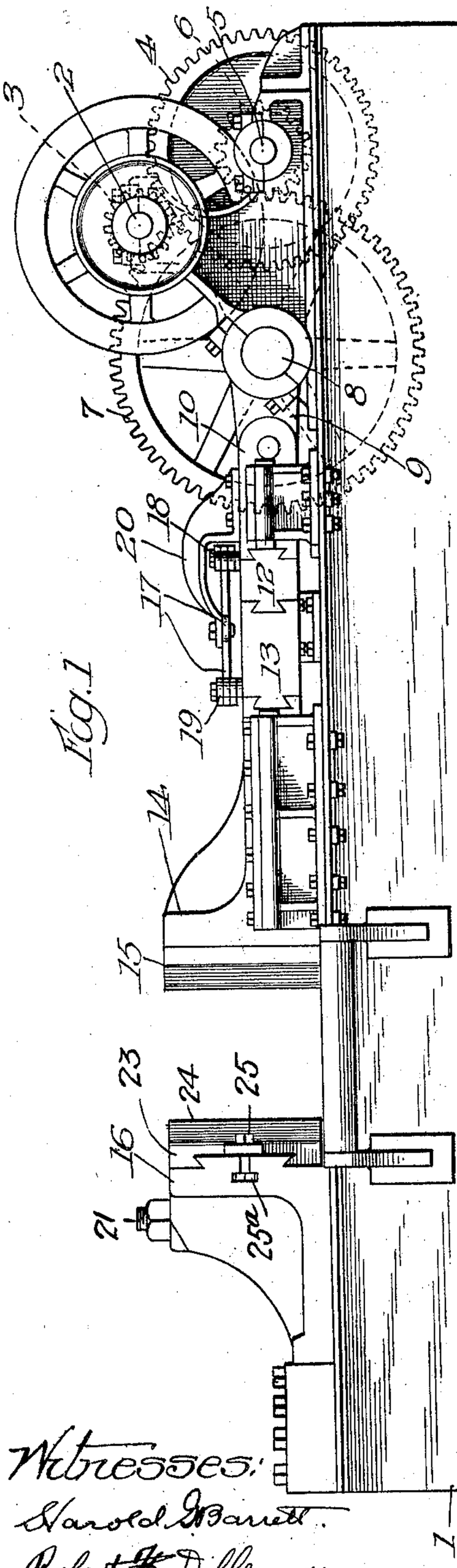

Fig. 1

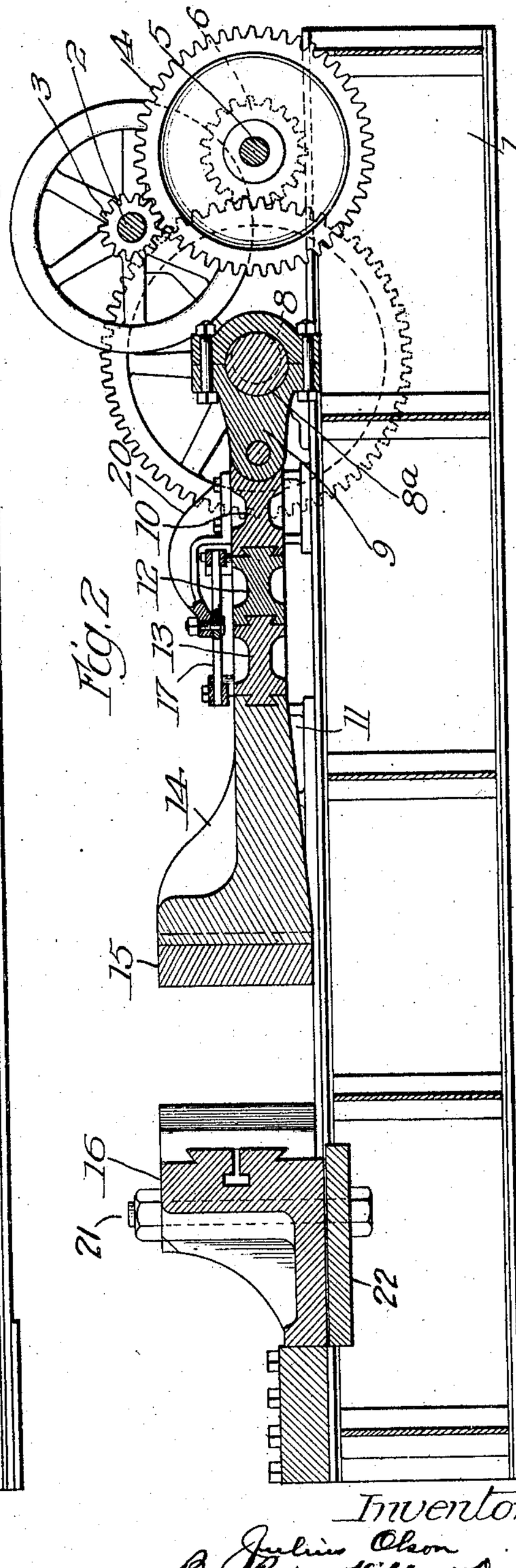

Fig. 2

Witnesses:

Harold D. Barrett.

Robert K. Dobberman

Inventor:

Julius Olson

By Rector, Hibben & Davis

His Attys

THE NORRIS PETERS CO., WASHINGTON, D. C.

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Fig. 3

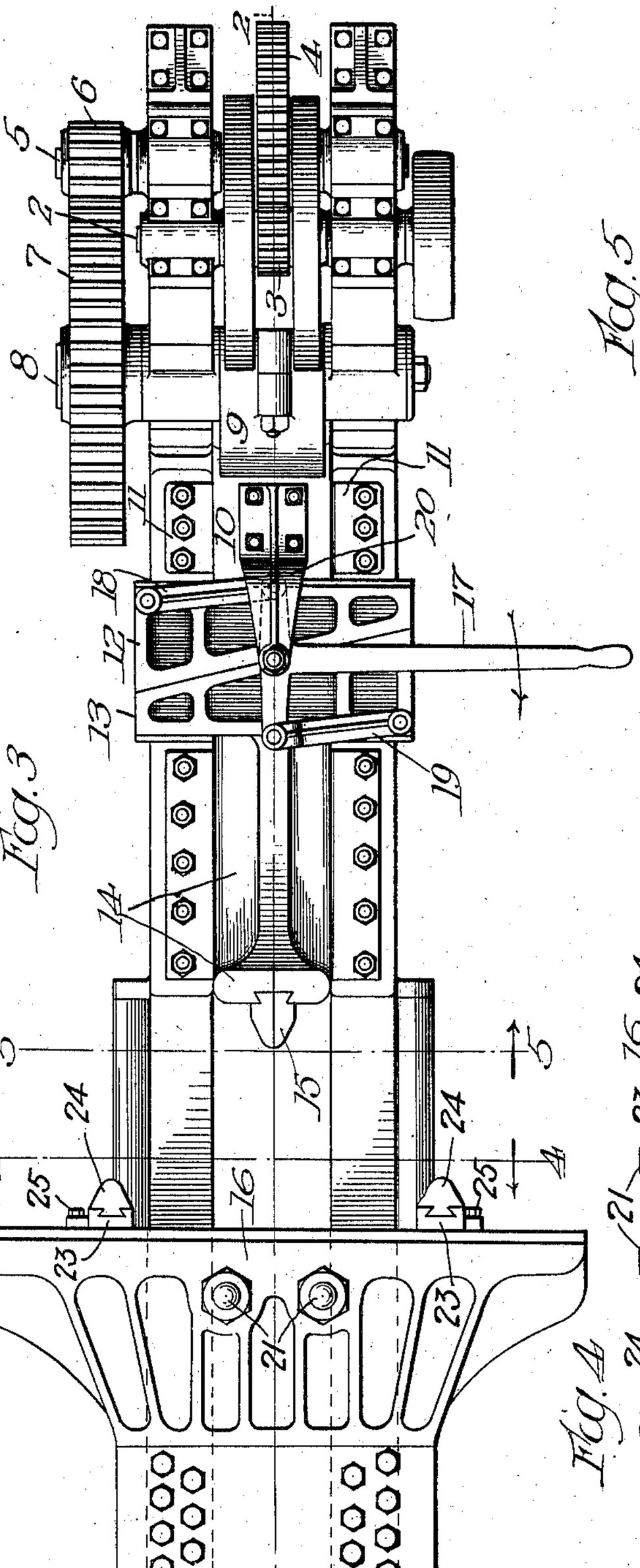


Fig. 5

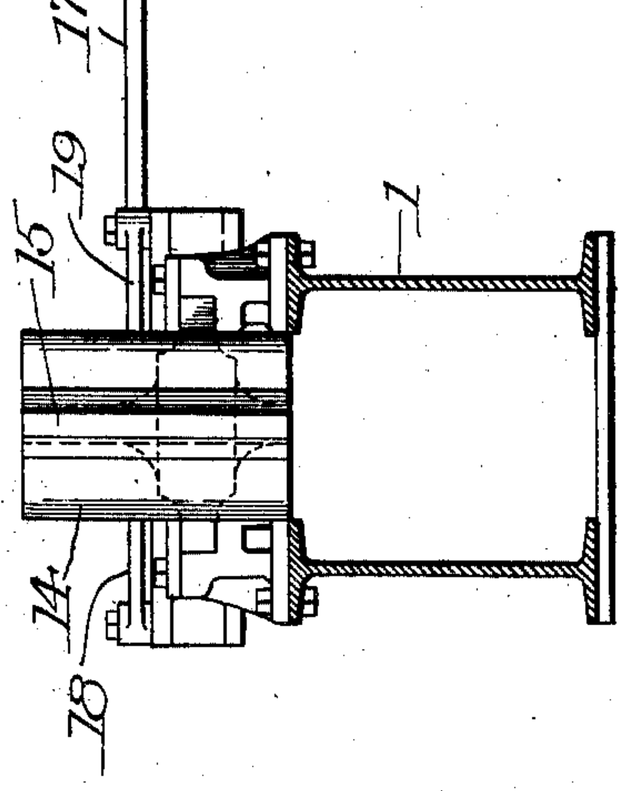
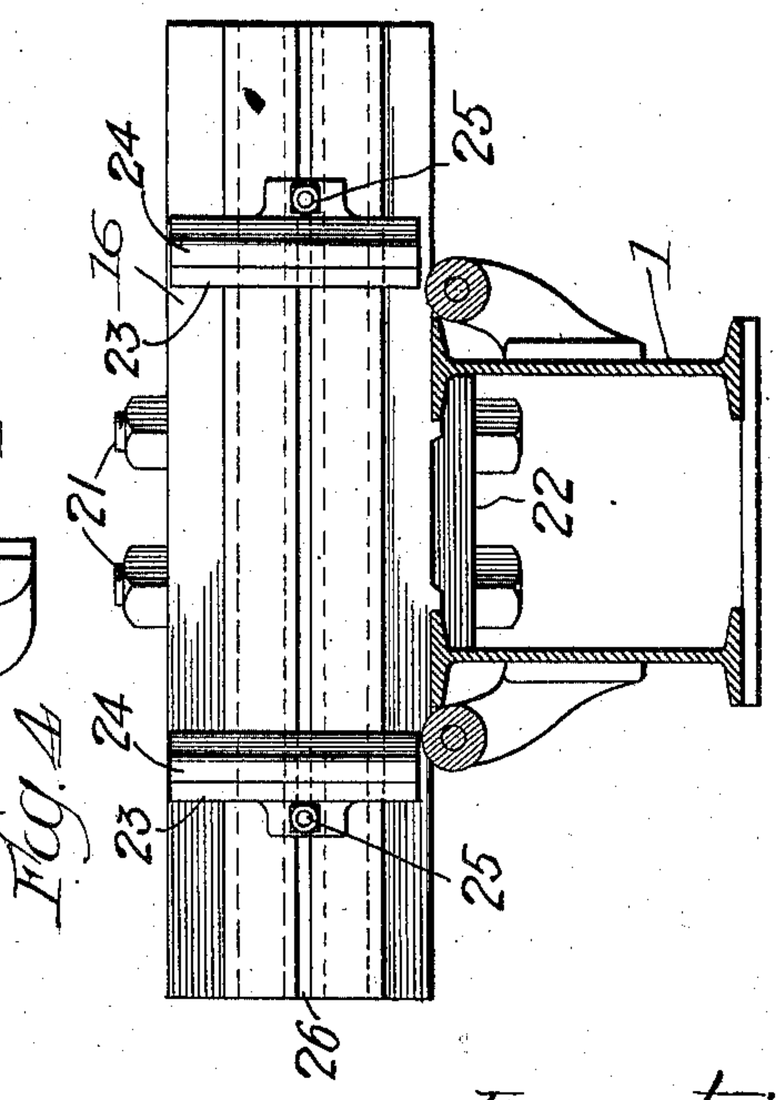


Fig. 4



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His Attys

UNITED STATES PATENT OFFICE.

JULIUS OLSON, OF CHICAGO, ILLINOIS, ASSIGNOR TO HANSELL-ELCOCK COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

BENDING AND STRAIGHTENING MACHINE.

963,636. Specification of Letters Patent. Patented July 5, 1910.

Application filed March 15, 1909. Serial No. 483,491.

To all whom it may concern:

Be it known that I, JULIUS OLSON, a citizen of the United States, residing at Chicago, Cook county, Illinois, have invented certain new and useful Improvements in Straightening and Bending Machines, of which the following is a specification.

My invention relates to straightening and bending machines which are commonly termed in practice "bulldozers," and the object thereof is to provide a machine of this character with simple and efficient means for regulating the blow of the working tool and for following up the work with the tool as the operation of straightening and bending proceeds.

The various features of advantage and utility in my improved machine will be apparent from the description hereinafter given.

In the drawings, Figure 1 is a side elevation of a machine embodying my invention; Fig. 2 a section on the line 2—2 of Fig. 3; Fig. 3 a plan view of the machine; Fig. 4 a section on the line 4—4 of Fig. 3; and Fig. 5 a section on the line 5—5 of Fig. 3.

The operating parts of the machine are provided with a suitable frame or bed which may be of any desired character or construction but which is here shown as a bed 1 of I-beam and plate construction. Upon one end of the bed is mounted the driving mechanism which, so far as my invention is concerned, may be of any suitable or desirable construction but which here comprises the following elements: The power-shaft 2 of the machine, which is driven by any suitable prime mover, is provided with a pinion 3 meshing with a gear 4 secured to a cross-shaft 5 and provided with a pinion 6. This latter pinion in turn meshes with a gear 7, mounted on the main shaft 8 suitably journaled on the bed of the machine. This main shaft is an eccentric shaft being provided with an eccentric 8^a which is formed intermediate its length and coöperates with an eccentric strap 9 extending forwardly and longitudinally of the machine. This eccentric strap is pivotally connected at its forward end to a cross-head 10 movable in suitable guides indicated at 11 on the upper face of the machine bed. This cross-head is operatively connected with one of the members of a block which are so constructed and related as to adjust or change the width of such block as determined by the operator, in the manner hereinafter described. In the present instance and by preference this cross-head is connected to its block member 12 by being dove-tailed therein as indicated in Figs. 1 and 2 and this block member is in turn operatively connected to its companion member 13, being connected in suitable manner but preferably by dove-tailing, as shown in the same figures. These two block members form a rectangular-shaped block when the same are at their intermediate position and are provided with adjacent complementary faces, with the result that by shifting the same longitudinally upon such faces or oblique line of division the width of the block is increased or decreased, according to the relative direction of shifting of the block members or sections. The forward block member 13 is operatively connected as by means of dove-tailing to the rearward end of a sliding or reciprocating tool holder or head 14 whose forward end receives and removably holds the working tool 15 usually employed for the purpose.

The machine is also provided with the usual work-holder or bracket 16, to which the work is clamped and by which it is held in the ordinary and well-known manner.

As stated, my invention resides in the means for regulating the blow of the working tool and suitable and efficient means for following up the work with the tool, to which end the adjustable block already described is employed. For the convenient operation of the block members or sections by sliding or shifting them one upon the other in the proper direction, I employ suitable means under the control of the operator, the same here consisting of a T-shaped lever 17 arranged in horizontal position with the lever arm extending to one side of the machine within easy reach of the operator, the cross arm of such lever being operatively connected by means of links 18 and 19 to opposite ends of the two block sections, the link 18 being connected to one end of the block section 12 and the link 19 being connected to the other block section but at the opposite end thereof. For the purpose of pivoting and supporting this operating lever I employ a bracket 20 which is secured upon the cross-head 10 and thereby reciprocates with it.

From the foregoing description it is evident that while the throw of the working tool remains the same because of its operative or indirect connection with the eccentric, the blow of the tool and its range of travel relative to the work may be regulated and the work may thereby be followed up or the limits of travel of the working tool may be restricted as required by the nature of the work.

It is obvious that when the block sections are in the relative position shown in Fig. 3 the working tool has a middle range of travel but that when the hand lever 17 is moved in a clockwise direction the limits of travel of the working tool are advanced, and the work may be followed up, inasmuch as this movement of the hand lever so shifts the block sections that the width of the block will be increased. A movement of the hand lever in the opposite direction will have the contrary result.

By preference the work bracket 16 is movable toward and away from the reciprocating head 15 and to this end such bracket is arranged to slide on the main frame or bed 1 of the machine and to be clamped in adjusted position by means of the clamping bolts 21 and the plate 22. Also by preference the bending blocks carried by such bracket are adjustable transversely of the machine and consequently transversely of the direction of reciprocation of the head 15, to which end the blocks 23 into which the bending tools proper marked 24 are inserted by dovetailing or otherwise, are in the present instance dovetailed onto the bracket and secured or clamped in place by the bolts 25 whose heads 25ª slide in the transverse groove 26 in the bracket, (see Figs. 1 and 4).

I claim:

1. In a machine of the class described, the combination with the work bracket or support and the reciprocating tool head or holder and its working tool, of operating mechanism for operating the head including an interposed block made in similar sections movable with respect to each other and in opposite directions to vary the size thereof in the direction of reciprocation.

2. In a machine of the class described, the combination with the work bracket or support and the reciprocating tool head or holder and its working tool, of operating mechanism for operating the head including an interposed block made in similar sections slidable upon each other in opposite directions to vary the size thereof in the direction of reciprocation.

3. In a machine of the class described, the combination with the work bracket or support and the reciprocating tool head or holder and its working tool, of operating mechanism for operating the head including an interposed block made in similar sections with complementary inclined meeting faces slidable upon each other to vary the size of the block in the direction of reciprocation.

4. In a machine of the class described, the combination with the work bracket or support and the reciprocating tool head or holder and its working tool, of operating mechanism for operating the head including an interposed block made in similar sections with complementary inclined meeting faces, and means for moving such sections in opposite directions and transversely of the direction of reciprocation to vary the size thereof longitudinally of such direction of reciprocation.

5. In a machine of the class described, the combination with the work bracket or support and the reciprocating tool head or holder and its working tool, of operating mechanism for operating the head including an interposed block made in similar sections with complementary inclined meeting faces, and means for moving such sections in unison in opposite directions and transversely of the direction of reciprocation.

6. In a machine of the class described, the combination with the work bracket or support and the reciprocating tool head or holder and its working tool, of operating mechanism for operating the head including an interposed block made in similar sections with complementary inclined meeting faces, and an operating lever operatively connected with said sections for moving them in unison and in opposite directions and transversely of the direction of reciprocation.

7. In a machine of the class described, the combination with the work bracket or support and the reciprocating tool head or holder and its working tool, of operating mechanism for operating the head including an interposed block made in similar sections with complementary inclined meeting faces, and a T-shaped lever operatively connected at the ends of its cross arm with opposite ends of said sections.

8. In a machine of the class described, the combination with the work bracket or support and the reciprocating tool head or holder and its working tool, of operating mechanism for operating the head including an interposed block made in similar sections with complementary inclined meeting faces, a pivoted T-shaped lever, and links connecting between the ends of the cross arm of such lever and opposite ends of said sections.

9. In a machine of the class described, the combination with the work bracket or support and the reciprocating tool head or holder and its working tool, of operating mechanism for operating the head including an interposed block made in similar sections with complementary meeting faces which are dovetailed together, and means for mov-

ing said sections in unison and transversely of the direction of reciprocation.

10. In a machine of the class described, the combination with the work bracket or support and the reciprocating tool head or holder and its working tool, of operating mechanism for operating the head including an interposed block made in similar sections with complementary meeting faces, and also including an eccentric shaft, an eccentric strap coöperating therewith, and a cross head connected at one end with the strap and at the other end with one of the block sections.

JULIUS OLSON.

Witnesses:
THOS. P. O'DONOVAN,
R. GOLDSTINE.