

No. 671,716.

Patented Apr. 9, 1901.

R. BATES.
TIRE UPSETTING MACHINE.

(Application filed Feb. 16, 1900.)

(No Model.)

Fig. 1.

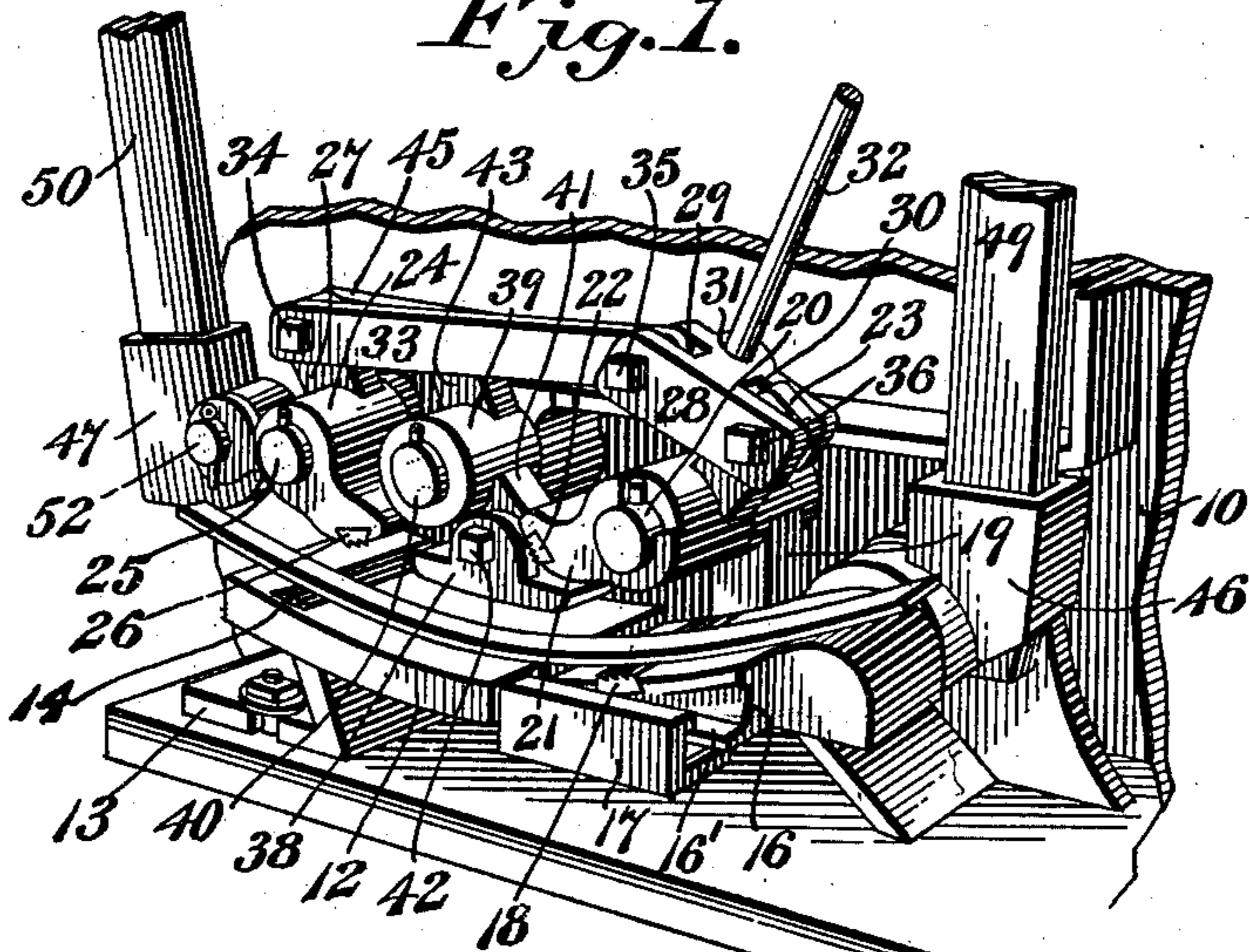


Fig. 2.

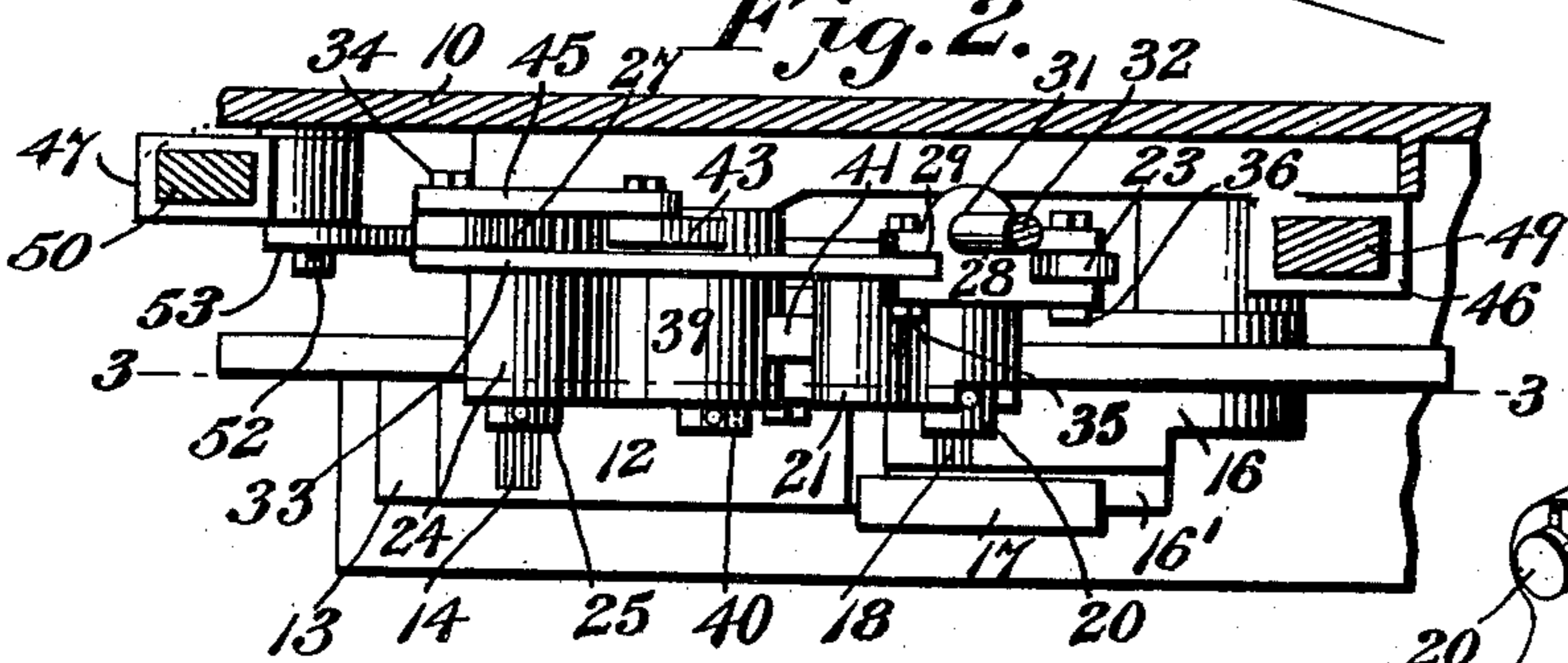


Fig. 4.

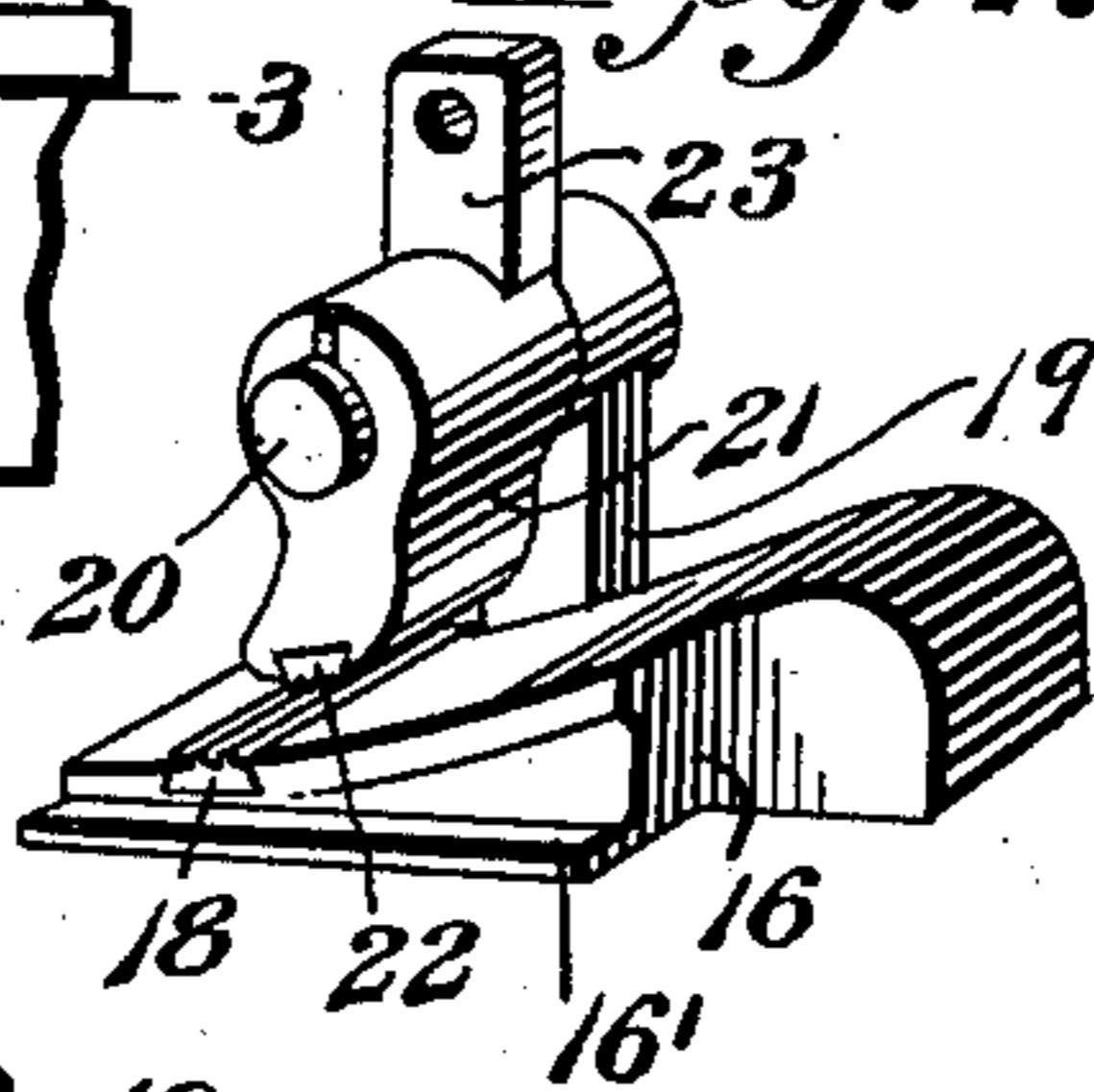
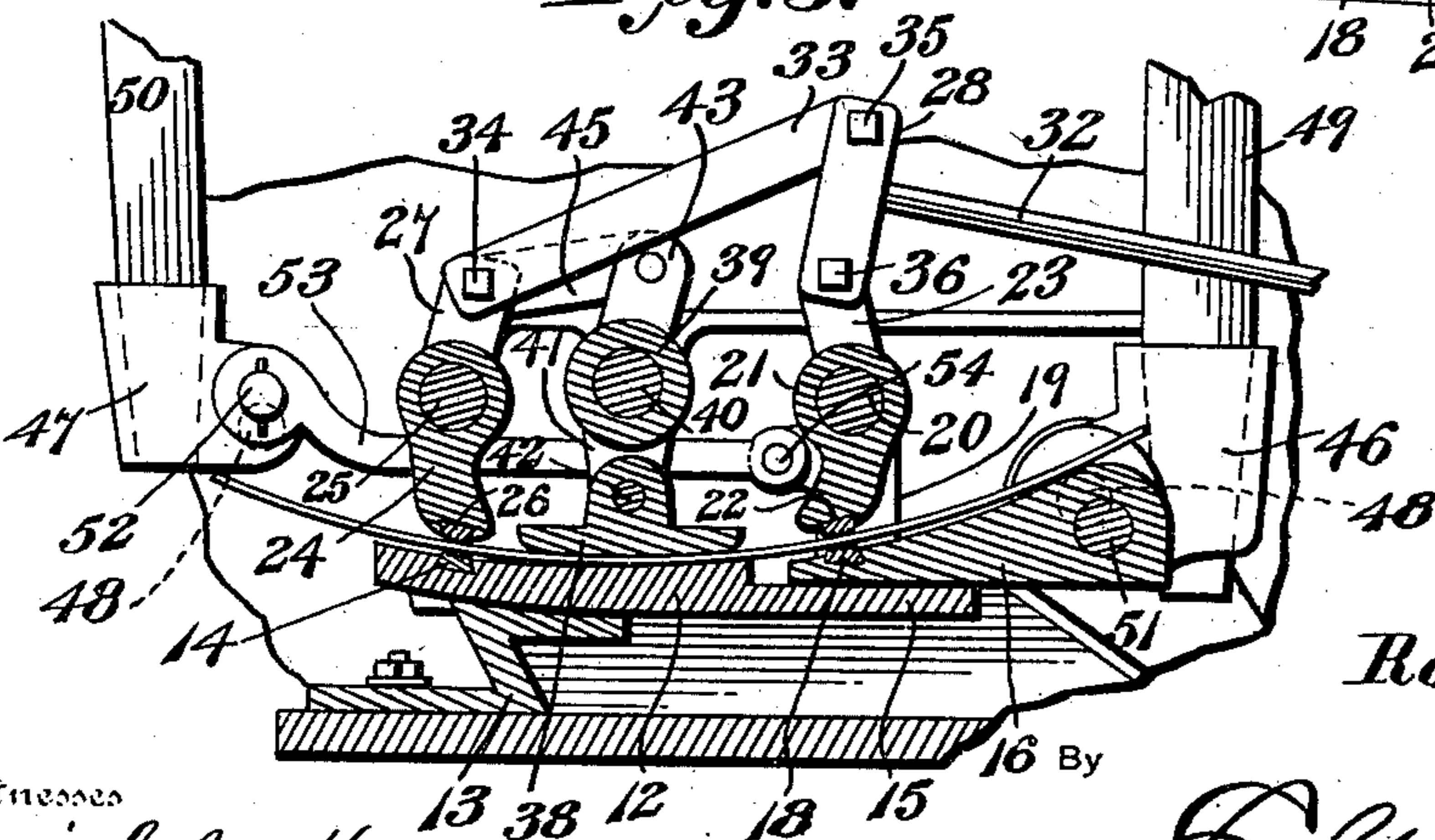


Fig. 3.



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TIRE-UPSETTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 671,716, dated April 9, 1901.

Application filed February 16, 1900. Serial No. 5,482. (No model.)

To all whom it may concern:

Be it known that I, ROBERT BATES, a citizen of the United States, residing at Grand Rapids, in the county of Wood and State of Wisconsin, have invented a new and useful Metal-Upsetting Machine, of which the following is a specification.

My invention relates to a metal-upsetting mechanism which may be embodied as a separate machine or as a part of a combination metal and wood working machine, the latter forming the subject-matter of a separate application filed by me of even date herewith, Serial No. 5,484.

One object of this invention is to provide a simple mechanism operable by a limited movement of the lever or levers to secure a powerful upsetting action on a heated metallic bar or rod, such as may be employed in a bent or circular metallic tire for the purpose of shrinking the same.

A further object is to provide means for securely gripping the work, operable independently of the upsetting means for the purpose of clamping and releasing the work, such gripping means remaining unaffected by the operation of the upsetting means.

A further object is to provide means for holding or restraining the work against buckling or displacing during the upsetting action, said restraining means being controllable by the work-gripping means, so as to be automatically thrown into and out of operative relation with the work on the operation of the gripping means.

Further objects and advantages of this invention will appear in the course of the subjoined description, and the novelty in the combinations of mechanisms and in the construction and arrangement of parts will be fully defined in the claims.

In the drawings, Figure 1 is a perspective view of a metal-upsetting mechanism constructed in accordance with this invention and showing the gripping devices in their open positions for the reception of the work. Fig. 2 is a plan view of the mechanism shown by Fig. 1. Fig. 3 is a longitudinal sectional elevation with the grippers in their closed positions, the plane of the section being indicated by the dotted line 3 3 on Fig. 2. Fig. 4 is a detail view of one slidable element of the

upsetting mechanism and the gripper, which is adjustable therewith.

The same numerals of reference are used to indicate like and corresponding parts in each of the several figures of the drawings.

The frame 10 for supporting the operating parts of the upsetting mechanism may correspond to the bed of the combination wood and metal working machine hereinbefore referred to as forming the subject-matter of another application; but if the upsetting mechanism is made separately from the combination-machine the frame 10 may be of any suitable character or construction. The frame is provided with an offset flange, and a work-bed 12 rests on or is made integral with a rest 13. This work-bed is preferably curved somewhat in the direction of its length, and on the upper surface thereof, near one end, is a fixed jaw 14. The other end of the bed is reduced in thickness, so as to form a guide extension 15, on which is slidably fitted a movable member 16 of the upsetting mechanism, said movable member being flanged at 16' and fitted slidably in a guide-boxing 17, which is preferably attached to the guide extension 15 of the bed, so that the boxing will occupy a flush relation to the upper surface of the bed. The slidable member 16 is tapered from the shouldered portion of the bed, so as to present an inclined surface to the action of one of the grippers, and on the upper inclined surface of this slidable member is a fixed jaw 18, which is similar to the jaw 14 on the work-bed. The slidable member 16, which practically constitutes a part of the work-bed, is provided at its inner edge with an upstanding post 19, which is arranged to one side of the jaw 18, and this post supports a trunnion 20, which overhangs the bed member 16. On this trunnion is loosely mounted a gripper 21, which is adapted to turn freely on a horizontal axis, so as to swing toward or from the bed member 16, and in one end of this gripper is a jaw 22, which when the gripper is swung in a downward direction is brought into opposing relation to the jaw 18 on said bed member 16. Another gripper 24 is mounted over the member 12 of the work-bed, and this gripper is loosely supported on a horizontal trunnion 25, which is fast with a part of the frame 10, so that the

gripper 24 is likewise free to turn on a horizontal axis. In the free end of this gripper is a jaw 26, which is brought into opposing relation to the jaw 14 on the bed member 12 by a downward movement of the gripper 24. The gripper 21 is provided with an arm 23, extending in an opposite direction from the jaw 22, and the other gripper 24 is likewise provided with an upstanding shank 27. These two grippers are operatively connected to a single operating or lever head 28, which when moved in either direction serves to simultaneously actuate the two grippers. This lever-head is provided at its opposite ends with the slots 29 30, and at an intermediate point of its length said head is provided with a socket 31, adapted to receive one end of an operating lever or handle 32, by which the head may be conveniently manipulated. The gripper 24 is connected with the lever-head through the medium of a link 33, one end of which is pivoted by a bolt 34 to the shank 27 of said gripper, while the other end of the link is pivoted within the slotted end 29 of the lever-head, as at 35. The other gripper 21 has its shank or arm 23 fitted in the slot 30 of the lever-head, so as to be connected directly by a pivot-bolt 36 thereto, whereby a movement of the lever 32 and the head 28 in one direction serves to simultaneously move the two grippers on their horizontal axes and in opposite directions. It is thus apparent that a single movement of the lever serves to throw the two levers into positions for the jaws thereof to coact with the jaws on the members 12 16 of the work-bed for the purpose of clamping the work at two points; but a movement of the lever in the reverse direction moves both the grippers simultaneously and withdraws the jaws of said grippers away from the work, thereby releasing the latter and permitting the same to be easily removed from the upsetting mechanism.

In connection with the gripper mechanism I employ a work-restraining device, which is situated between the grippers and the two sets of jaws on said grippers and the members of the extensible work-bed, said work-restraining device being disposed in operative relation to the path of the work for engagement with the latter in a manner to prevent buckling or bending of the work during the upsetting operation. This restrainer is in the form of a jaw 38, which is operated by a lever 39, the latter being fulcrumed by loosely mounting the same on a short stud or trunnion 40, which is fast with the machine-frame. This lever is provided with a depending short arm 41, pivotally connected at 42 to suitable upstanding lugs on the restrainer-jaw, and the long arm 43 of the lever is pivoted at its upper extremity to one end of a short link 45, the latter being extended to and fitted on the bolt 34, which pivotally connects the link 33 to the gripper 24. By means of this link 45 and the lever 39 the restrainer-jaw is controlled by the gripper

mechanism, and these parts are arranged to throw the restrainer-jaw 38 into operative relation to the work simultaneously with the grippers 21 24; but a reverse movement of the grippers withdraws the jaw 38 from the path of the work, so that both of the grippers and the restrainer-jaw are released from the work by a single movement of the lever-head 28 and the lever 32 thereof.

The upsetting mechanism of my invention may be operated from one or more levers; but I prefer to employ two levers which are disposed at opposite ends of the upsetting mechanism, so that either of the levers may be employed for the operation of moving one member of the extensible bed relatively to the other member thereof. I employ two lever-heads 46 47, each of which is fulcrumed at 48 on a part of the frame 10. The head 46 is provided with a socket for the reception of a lever 49, while the other head 47 is similarly provided with a socket for the lever-arm 50. The lever-head 46 has an eccentric connection at 51 with the member 16 of the extensible work-bed; but the lever-head 47 is provided with an eccentric stud 52, which is connected by a link 53 with the post 19 of the slidable bed member 16, as by the pivotal joint 54, said link being arranged in rear of the gripper 24 and the restrainer device, as shown by Fig. 2. This peculiar arrangement is possessed of special utility for the reason that the grippers are connected by toggle members and serve to operate the work-restraining device, which is also of toggle formation in view of the fact that the restrainer-jaw 38 is pivoted upon the arm 41 of the lever 39, the pivotal connection between the jaw 38 and the lever 39 constituting a work-restraining toggle. The great efficiency of this arrangement will appear in view of the manipulation of the parts during the upsetting of the tire.

In operation the lever 32 is moved in an upward direction for the purpose of withdrawing the grippers and the restrainer-jaw from the members of the extensible work-bed, and with the parts in the position shown by Fig. 1 a metallic bar or rod of any character and which has been previously heated to the required temperature may be placed on the members 12 16 of the work-bed, so as to engage with the jaws 14 18, respectively. The lever 32 is now depressed to simultaneously move the grippers 21 24 and the jaw 38. This operation moves the jaws 22 26 of the grippers into operative relation to the jaws 14 18 on the members of the bed, whereby the work is firmly gripped at two points by the sets of jaws. At the same time the jaw 38 is actuated to engage with the work at a point between the gripping by the two sets of jaws, said jaw 38 presenting an elongated surface to the work. Either of the levers 49 or 50 may now be operated, and in case the lever 49 is actuated the bed member 16, its post 19, and the gripper 21 are moved toward the bed member 12 and the gripper

24, so as to upset the metal, the bed member 16 being limited to slidable movement by the guide-boxing. When the lever 50 is operated, the link 53 transmits the motion to the slidable bed member 16, so as to move the latter and the gripper thereon toward the other gripper, thus upsetting the metal. In the upsetting operation the grippers remain in engagement with the work, so as not to be affected by the operation of the parts to upset the lever, and the jaw 38 prevents the metal from bending in an upward direction by reason of the fact that the swinging of the lever 39 has alined the point of contact of the jaw 38, the pivot of said jaw, and the axis of the lever 39, while the bed restrains the metal from bending in a downward direction. After the metal shall have been upset the lever 32 is operated to withdraw the grippers and the restrainer-jaw, and the work may then be removed, it being apparent that the release of the restrainer-jaw 38 is effected through the lateral movement of the knuckle of the toggle of which said jaw forms one member.

My improved mechanism may be employed for upsetting any kind of metal; but, as herein shown and described, this mechanism is especially adapted to the work of shrinking metallic tires for vehicles.

Changes within the scope of the appended claims may be made in the form and proportion of some of the parts while their essential features are retained and the spirit of the invention is embodied. Hence I do not desire to be limited to the precise form of all

the parts as shown, reserving the right to vary therefrom.

Having thus described the invention, what I claim is—

1. In a tire-upsetting device, the combination with a frame and fixed bed member, of a movable bed member, grippers carried by the fixed and movable bed members, means for operating the movable bed member, and a toggle-operated work-restraining jaw intermediate of the grippers.

2. In a tire-upsetting device, the combination with a frame and fixed bed member, of a movable bed member, interdependent grippers carried by the fixed and movable bed members, and a toggle-operated work-restraining jaw intermediate of the grippers, said jaw being operatively connected with the grippers for actuation therewith.

3. In a tire-upsetting device, the combination with a frame and fixed bed member, of a movable bed member, interdependent grippers carried by the fixed and movable bed members, a toggle-operated work-restraining jaw intermediate of the grippers, and table-operating devices at the opposite ends of the frame, both of said devices being operatively connected to the movable bed member.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ROBERT BATES.

Witnesses:

D. B. PHILLEO,
F. J. WOOD.