

A. H. WILSON.
WHEELWRIGHT MACHINE.
APPLICATION FILED FEB. 11, 1908.

898,811.

Patented Sept. 15, 1908.

2 SHEETS—SHEET 1.

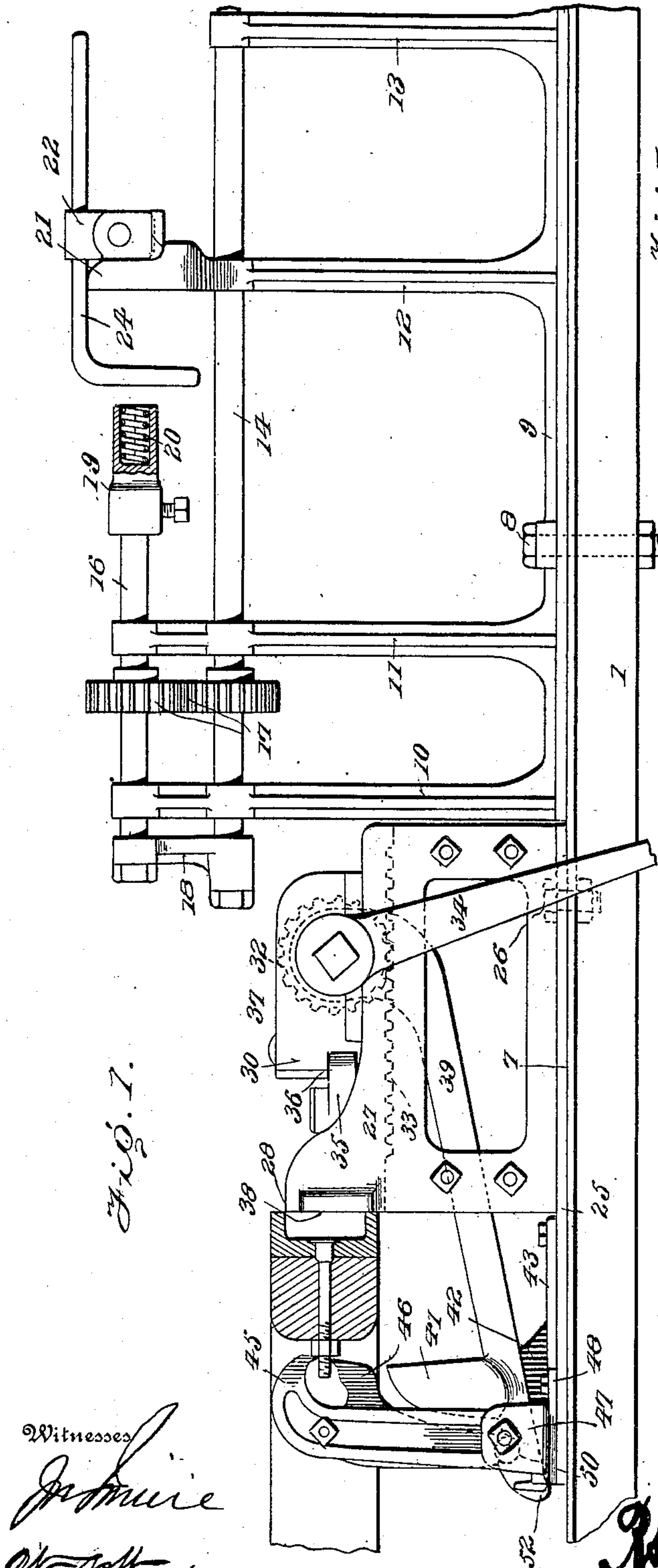


Fig. 1.

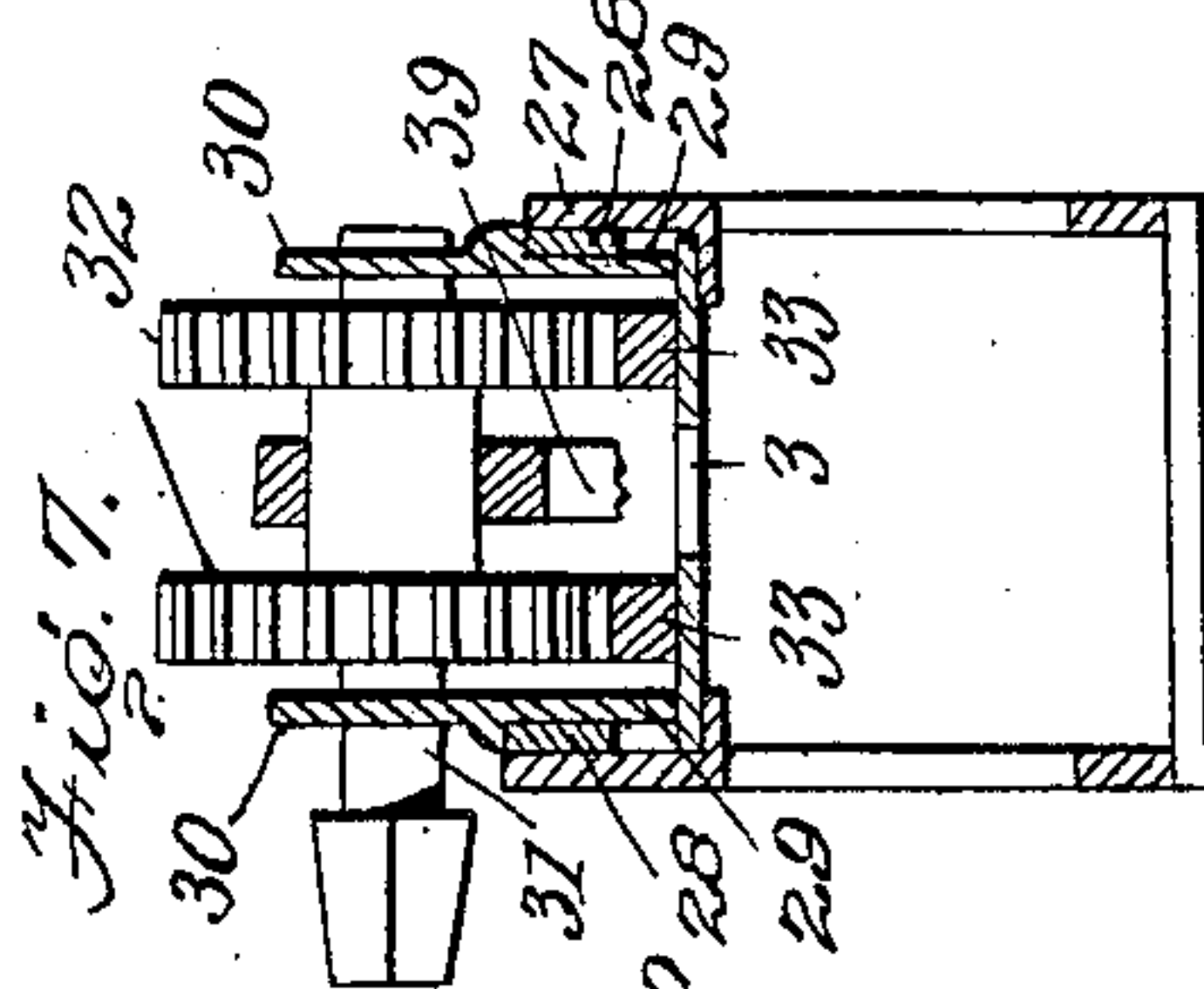


Fig. 7.

Fig. 6.

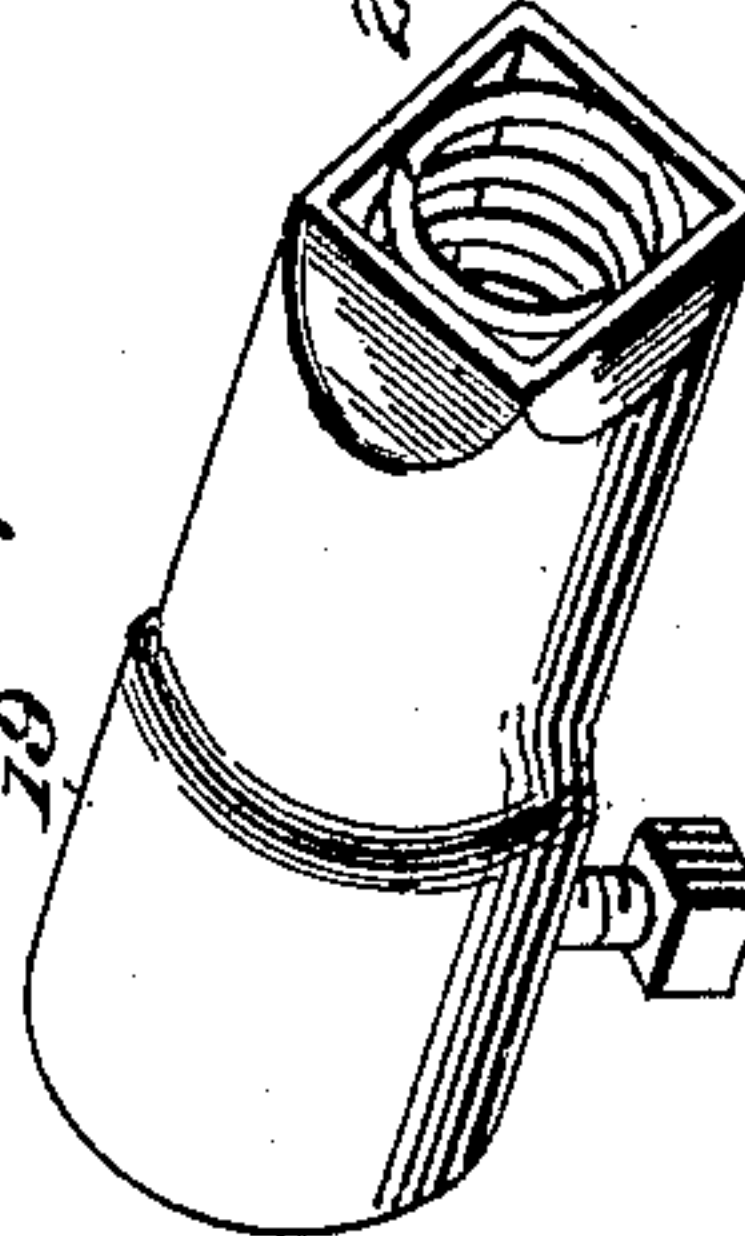
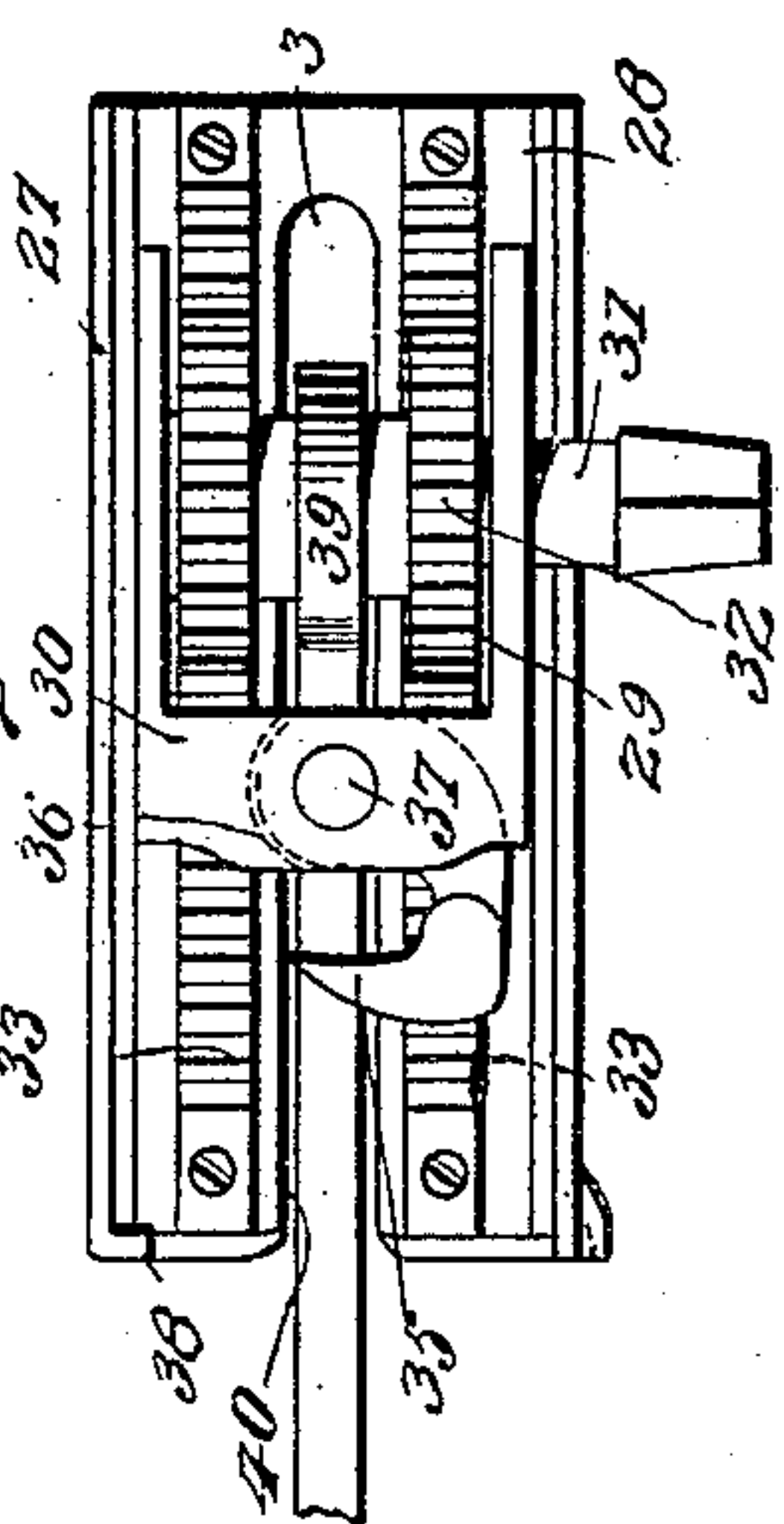


Fig. 4.



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Witnesses
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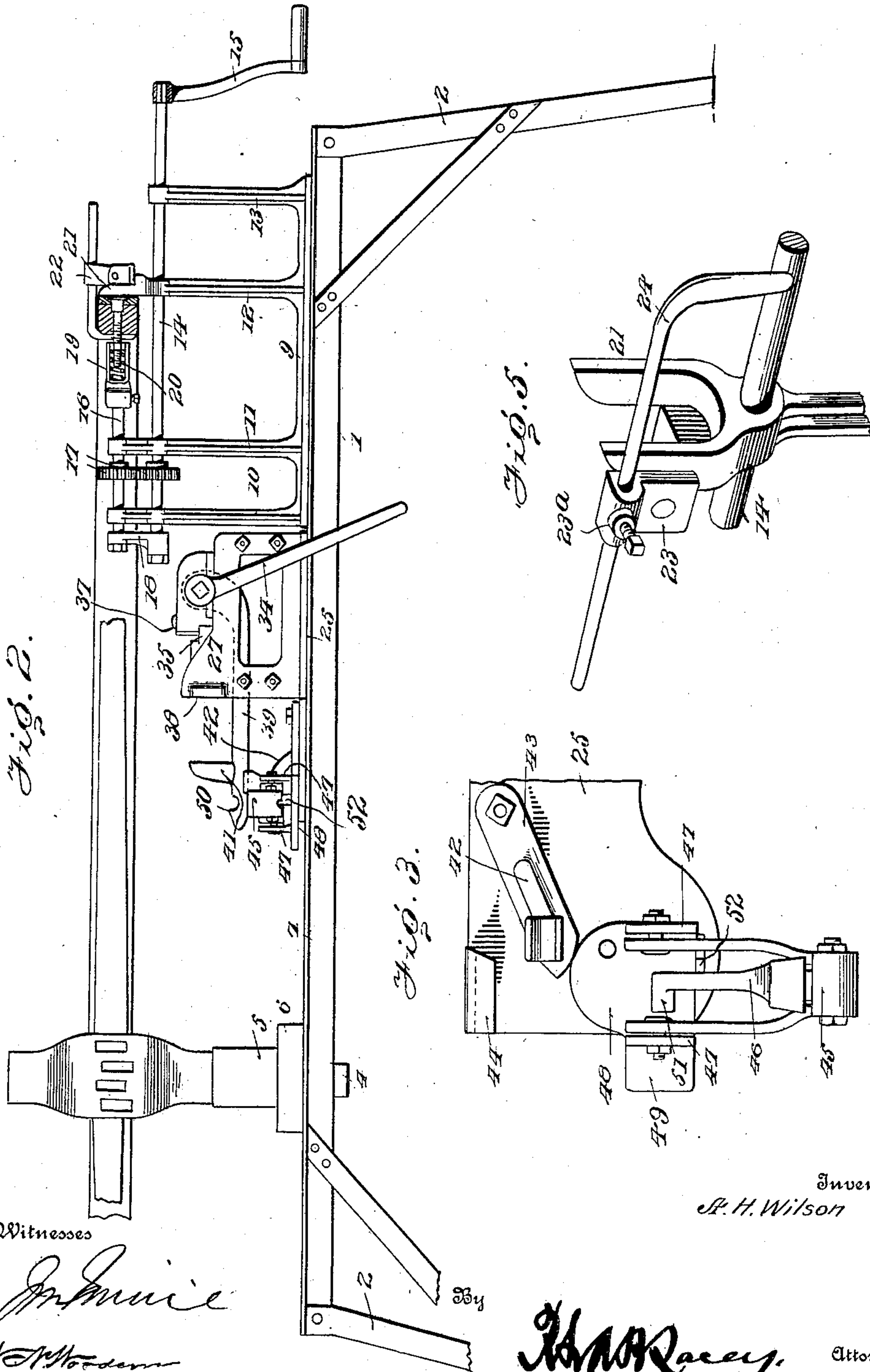
Pharaday, Attorneys

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2 SHEETS—SHEET 2.



Witnesses

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UNITED STATES PATENT OFFICE.

ARTHUR H. WILSON, OF LOOGOOTEE, ILLINOIS, ASSIGNOR OF ONE-HALF TO DISKEN PRYOR,
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WHEELWRIGHT-MACHINE.

No. 898,811.

Specification of Letters Patent.

Patented Sept. 15, 1908.

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To all whom it may concern:

Be it known that I, ARTHUR H. WILSON, citizen of the United States, residing at Loogootee, in the county of Fayette and State of Illinois, have invented certain new and useful Improvements in Wheelwright-Machines, of which the following is a specification.

This invention has for its object an improved wheelwright machine which will be efficient in operation and durable in construction and which will combine in the one machine practically all the various appliances necessary for a wheelwright in removing and bolting on tires and otherwise repairing wheels.

A further object of the invention is an improved apparatus of this character embodying a nut removing and applying mechanism which includes a longitudinally adjustable bracing hook designed to engage the felly of the wheel being operated upon, the adjustment of the hook rendering it applicable for use with different sized wheels.

A further object of the invention is a machine of this character embodying a bolt cutting and extracting mechanism so mounted upon the supporting bed or bench that it may be swung to one side so as to permit the wheel carrying spindle to be slipped up close to the nut removing or applying device, thereby rendering the entire apparatus susceptible to use with small wheels as well as large wheels.

The invention also has for its object an improved construction of bolt extracting claw so arranged as to render easy the extraction of the bolt and reduce the manual labor or exertion necessary for this part of the operation, the bolt being withdrawn with a straight draw.

A further object is a claw of this character which is so mounted as to render it capable of use in channeled tires as well as flat tires.

And a further object of the invention is an improved construction of bolt clipper so mounted that when it is not in use, it will not interfere with the bolt starting and extracting devices, but will serve to hold rigid the support for holding the bolt starting device in operative position, the specific construction of the clippers and the relative arrangement of the parts thereof making practically automatic the operation of coupling

the pivoted jaw of the clipper with the arm which operates it, as well as the reverse operation of uncoupling the said jaw from said arm.

With these and other objects in view as will more fully appear as the description proceeds, the invention consists in certain constructions, arrangements and combinations of the parts that I shall hereinafter fully describe and then point out the novel features in the appended claims.

For a full understanding of the invention, reference is to be had to the following description and accompanying drawings, in which:

Figure 1 is a side elevation of my improved apparatus, the bench or support being partly broken away; Fig. 2 is a similar view illustrating one application of the machine; Fig. 3 is a top plan view illustrating a portion of the bolt extracting appliances and the bolt clippers; Fig. 4 is a top plan view of another portion of the bolt extracting appliance; Fig. 5 is a detail perspective view of the bracing hook for holding the felly of a wheel; Fig. 6 is a detail perspective view of one of the wrenches employed, and Fig. 7 is a transverse sectional view through the casing and draw head illustrated in plan view in Fig. 4.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

Referring to the drawings, the numeral 1 designates the bench or support for my improved wheelwright machine, the same being mounted upon legs 2. The bench 1 is provided with a longitudinal slot 3 designed for the reception of a post 4 to be inserted in the hub of a wheel to hold it in proper position for being operated upon. The post 4 is provided with a wear plate 5 and a guide lug 6 below the same, said lug being seated directly in the slot 3, and the wear plate resting upon the spaced angle iron members 7 constituting the bed of the bench.

A pivot stud 8 is inserted through the slot 3 and is preferably provided with a clamping nut by which it may be held at different longitudinal adjustments in the slot, and a base plate 9 is secured intermediate of its ends on said pivot stud, so as to be supported on the bench to turn as well as slide thereon, to effect both angular and lateral adjustment of the base plate, according as the circum-

stances of the case may require. Standards 10, 11, 12 and 13 project upwardly from the base plate 9 in spaced relation from each other as shown and in longitudinally extending series, and a horizontal drive shaft 14 is journaled in said standards, said shaft being provided at one end with a preferably removable crank handle 15 by which it may be turned.

10 A countershaft 16 is journaled in the standards 10 and 11 above the drive shaft 14 and pinions 17 are secured on the respective shafts and mesh with each other as shown so as to impart motion from the drive shaft to the countershaft. Both of the shafts are mounted for a longitudinal sliding as well as a rotary movement in the standards, the longitudinal movement being limited by the abutment of the pinion 17 with either of the standards 10 or 11. The outer ends of the two shafts are connected together for simultaneous longitudinal movement by means of a link 18. At the end opposite to that carrying the link the countershaft carries a wrench 19 which is adapted to be slipped thereover and held thereon by a set screw as shown, the wrench being preferably a socket wrench and containing a nut ejecting spring 20 so that after a nut has been removed, the spring will force the nut from the wrench and will allow it to drop into a pan or other receptacle underneath. The wrench 19 is removable, and a plurality of these wrenches is employed interchangeably, being provided with different sized sockets to fit different nuts. They are all arranged for detachable connection on an end of the countershaft 16, so that one may be removed and replaced by another. Facing the outer end of the wrench 19, is an upright fork 21, on the upper end of the standard 12, and to the outer side of said fork is secured an angular bracket 22 for the purpose of supporting a clamping lever (not shown) and other parts described and claimed in my prior United States Patent No. 850,809, dated April 16, 1907, which see. To one side of the bracket 22, a plate 23 is pivoted to turn about a horizontal axis, and said plate carries a sleeve 23^a in which a bracing hook 24 is mounted for longitudinal adjustment. This hook is held at the proper adjustment in the sleeve 23 by means of a set screw as shown, and it is designed to take over the felly of a wheel to hold the same with the hub as a center, while the wrench is being operated.

In addition to the parts above described, my improved wheelwright machine comprises means for clipping the ends of bolts after the nuts have been screwed up tight and means for starting and extracting the bolt after the nuts have been removed. Such bolt clipping and extracting mechanism may be mounted on the same base plate with the nut applying and removing mechanism

and alongside of the same, if desired, but in the present instance, and preferably, I mount the bolt clipping and removing mechanism upon a base plate 25 which is pivotally supported on the bench 1 by means of a pivot stud or bolt 26 so that it may extend in longitudinal alinement with, and upon the bench, or be swung backwardly away from the slot 3 when not in use so as to permit the post to be slipped nearer to the nut applying and removing device, this feature being a desideratum, particularly when operating upon small or low wheels. The base plate 25 carries a casing 27, the inner walls of which at the upper end are provided with horizontally extending guide rails 28 fitting within the longitudinal grooves 29 formed in the exterior side walls of a draw head 30, the said draw head being thus mounted for a longitudinal movement on the casing, as clearly illustrated in the drawings. A shaft 31 extends transversely of and is journaled within the draw head 30, and pinions 32 are mounted upon the shaft and mesh with longitudinally extending racks 33 secured to or formed in the casing 27. The said shaft 31 may be turned by means of a crank handle 34 preferably removably connected thereto, the turning of the shaft obviously moving the draw head longitudinally of the casing. A claw 35 fits within a recess 36 formed in the draw head 30 and is pivotally secured therein by means of a coupling pin 37 so as to swing about a vertical axis. The claw 35 is designed to extract the bolts from the felly of the wheel after the nuts thereof have been removed and the bolts have been started, and the particular construction and arrangement of the claw, as illustrated in the accompanying drawings, provides that when the claw is moved against the tire, it will swing backwardly until the points of its claw are in position to effectively catch the slightly projected bolt head so as to enter between the head and the tire. Then, when the operator commences pulling upon the bolt, the claw will automatically swing forwardly, its outer edge rolling against the tire, thereby giving the claw a maximum leverage for the immediate starting of the bolt. As the shaft 31 is turned, the bolt will be withdrawn by a straight pull, the movement being only limited by the movement of which the draw head is capable, the device being therefore so constructed and arranged that very long bolts may be withdrawn. It is to be particularly noted that as the claw is mounted to swing in a horizontal plane, it may readily enter the channel of the tire, thereby rendering it capable of being used with equal facility on channeled tires as well as flat tires.

38 designates a head that is formed on the casing for the tire to abut against when the bolts are being extracted.

An arm 39 is mounted to move in a slot or

opening 40 formed in the casing and is pivotally mounted at one end on the shaft 31. The opposite end of the arm 39 projects out from the end of the casing and is provided with an upwardly projecting hook 41 arranged to be brought against the threaded end of a bolt after the nut has been removed therefrom, the draw head being then moved backwardly in the casing, so that the hook 41 will start the bolt out so that the claw 35 may effectively engage the head of the bolt and complete the extracting operation. In order to support the arm 39, at a proper elevation for this bolt starting operation, I provide a supporting post 42 which is recessed at its upper edge to raise the lower edge of the arm which is carried by a plate 43 mounted to swing laterally on the base plate 45 so that it may be turned out of the way of the arm 39 when not in use. In this position of the post 42, its free end enters one end of a socket 44 which faces inwardly on the base plate and which is preferably formed as an integral part thereof by turning up an extension of one side edge, as clearly illustrated in the drawings.

The bolt cutter or clipper of my invention embodies a main jaw 45, the handle end of which is bifurcated as shown, and 46 designates the pivoted jaw of the clipper which is pivotally mounted upon the main jaw, the handle end of the pivoted jaw swinging between the handle members of the main jaw. The handle members of the main jaw are pivotally connected to upwardly projecting ears 47 extending from a supporting plate 48 which is mounted to swing laterally on the base plate 25 in juxtaposition to the free end of the arm 39. The supporting plate 48 is formed on its free end with a lug extension 49 adapted to enter the socket 44 when the plate is swung around to bring the bolt clipping jaws to an operative position, and it is to be noted that in such position, the lug extension 49 of the plate 48 will abut against one end of the plate 43 so as to securely hold said plate in an inoperative position. Conversely, when the supporting plate 48 is swung to one side so as to carry the jaws 45 and 46 out of the way, the subsequent inwardly turning movement of the plate 43 will cause the latter to bear against the plate 48 and hold the latter in an inoperative position when the post 42 is supporting the arm 39 for a bolt extracting operation. In addition to this function as a bolt starting member, the arm 39 serves as an actuating arm for the bolt clippers. To this end, the outer extremity of the arm 39 is formed with an upwardly opening recess 50 beyond the hook 41. The extremity of the handle end of the pivoted jaw 46 is formed with a laterally projecting pin 51 designed to be received in the recess 50 with the two handle portions of the jaw in a substantially erect position, so that

the subsequent turning of the shaft 31 in one direction will cause the arm 39 to pull upon the pivoted jaw in a direction to close it towards the main jaw and thereby shear off the projecting end of the bolt after the nut has been screwed tightly thereon. In the operation of coupling together the pivoted jaw of the clippers and the arm 39, the plate 48 is first swung inwardly on the base plate 25, and the main jaw 45 is then swung upwardly, whereupon the forward movement of the arm 39, until the proper position is reached, will permit the jaw 46 to turn and the pin 51 to enter the recess 50. In the operation of uncoupling the pin from the arm 39, it is only necessary to swing the jaws backwardly to a horizontal position on their supporting plate, it being noted that this movement will bring the handle end of the pivoted jaw 46 upon an upwardly extending releasing lug 52 projecting upwardly from the supporting plate 48 between the ears 47 thereby serving as a fulcrum and automatically disengaging the pin from the recess.

The detail operations of the several parts of my apparatus having been described in connection with the construction and arrangement of the parts, I deem it superfluous to again set forth all of the operative details.

From the foregoing description in connection with the accompanying drawings, it is obvious that a wheel may be placed in an operative position by slipping the hub of the wheel over the post 4, the wheel being thereby supported for being operated upon by the several mechanisms employed in the machine. As an example, if the nuts are to be applied to the bolts, the felly will be securely held against operation by the bracing hook, and the shafts 14 and 16 may be turned by the crank handle 15 or any other suitable means or power in the proper direction. After the nuts have been screwed tightly on the bolts, the ends of the nuts may be clipped off by the pivoted jaws 45 and 46 and concomitant parts above described. Again if the nuts and bolts are to be removed, the nuts will be first drawn backwardly and removed from the bolts by the means of the rotary wrench, and the wheel will then be moved over so that the tire will rest against the head 38. The hook 41 will then be engaged with the inner end of the bolt and its supporting post 42 will then be moved over underneath the arm 39 so as to maintain the arm and its hook 41 at the proper elevation. The crank 34 will then be operated to move the draw head backwardly in its casing, the bolt being thereby started. Subsequently the bolt starting hook 41 will be disengaged from the inner side of the felly and be dropped downwardly and the claw 35 will then be engaged with the bolt and extract the same by a further backward movement of the draw head in its supporting casing 27.

Having thus described the invention, what is claimed as new is:

1. A machine of the character described, comprising a support, a standard rising from said support, a plate mounted to turn on said standard and provided with a sleeve, and a bracing hook longitudinally adjustable in said sleeve.

2. A machine of the character described, comprising a bench provided with a longitudinal slot, a hub post supported by the bench and movable along said slot, a wrench mechanism mounted on the bench, and other bolt working appliances mounted on the bench in longitudinal alinement with the wrench mechanism, such appliances being pivotally mounted on the bench and adapted to be swung to one side out of the way of the hub post whereby to permit the latter to be brought near the wrench mechanism.

3. In a machine of the character described, the combination with a support, of a casing mounted on said support, of a draw head supported by and movable longitudinally on the casing, means for moving the draw head, and a vertically swinging bolt starting hook carried by said draw head and adapted to project out of one end of the casing.

4. In a machine of the character described, a support, a casing carried by the support, a draw head supported by and movable along the casing, a bolt starting hook carried by said draw head, and a bolt extracting claw also carried by said draw head, and means for moving the draw head along the casing.

5. In a machine of the character described, a support, a casing carried by said support, a draw head supported by and movable along the casing, means for moving the draw head, said means embodying a shaft journaled in the draw head, pinions carried by the shaft and racks mounted in the casing, the pinions meshing with said racks, and a bolt starting hook pivotally mounted on said shaft and adapted to project out of one end of the casing.

6. In a machine of the character described, a support, a casing mounted on said support, a draw head supported by and having a longitudinal movement on the casing, means for moving the draw head, said means embodying a rack and pinion connection between the draw head and casing and an operating shaft therefor, and a bolt extracting claw carried by said draw head.

7. In a machine of the character described, the combination with a support, of a draw head mounted to move longitudinally of the support, and a swinging bolt extracting claw carried by the draw head.

8. In a machine of the character described, a support, a casing mounted on said support, a draw head supported by and movable along the casing, means for moving the draw head, the draw head being provided at one end with

a transversely extending slot, and a bolt extracting claw transversely movable in said slot.

9. In a machine of the character described, a support, a vertically movable bolt starting hook, a longitudinally movable draw head to which said hook is connected, means for moving the draw head, and a laterally swinging post adapted to support the free end of said hook, as and for the purpose set forth.

10. In a machine of the character described, a support, a vertically swinging bolt starting hook, a longitudinally movable draw head to which the hook is connected, a plate 43 mounted to swing laterally underneath the hook, and a supporting post for the hook carried by said plate.

11. In a machine of the character described, a support, a vertically swinging bolt starting hook, a longitudinally movable draw head to which said hook is connected, a plate 43 adapted to swing laterally underneath and to one side of the hook, there being provided an inwardly facing socket for the free end of the plate upon the swinging of the same out from under the hook, and a post carried by said plate and adapted to support the hook in raised position.

12. In a machine of the character described, a support, a longitudinally movable draw head mounted on said support, an arm carried by said draw head, a laterally swinging post mounted on the support and adapted to swing underneath the arm to hold the same in elevated position and also arranged to be swung out from under the arm to permit the same to be lowered, and bolt clippers having a laterally swinging movement on the support and arranged to be swung over in alinement with the arm, the clippers being arranged in such position for operative connection with the arm and for holding the post out of the way.

13. In a machine of the character described, a support, a draw head movable longitudinally on said support, an arm operatively connected to the draw head, said arm being mounted for a vertically swinging movement, a supporting post adapted to be swung underneath the arm to hold it elevated when it is swung out of the way of the arm to permit it to be lowered, a plate upon which said post is mounted, bolt clippers adapted to be swung to one side and to be brought into alinement with the arm and arranged for operative connection therewith, and a laterally swinging plate upon which said clippers are mounted, the plate of the post upon the engagement of the post with the arm being arranged to hold the plate of the clippers to one side.

14. In a machine of the character described, a support, a vertically swinging arm, means for drawing the arm in one direction, a supporting post adapted to hold the arm in

elevated position, a laterally swinging plate upon which said post is mounted, a plate 48 mounted to swing laterally on the support, bolt clippers carried by said last named plate, 5 said plate being provided with a lug extension 49, and there being provided a socket to receive said extension, as and for the purpose set forth.

15. In a machine of the character described, a support, a longitudinally movable arm, means for supporting and moving said arm, the arm being provided at its outer end with a recess, bolt clippers comprising a vertically swinging main jaw and a pivoted jaw,

the handle end of the pivoted jaw being provided with a laterally extending pin designed to enter said recess, a supporting plate for the main jaw, said plate being provided with a releasing lug arranged for engagement with the handle end of the pivoted jaw to tilt the same upwardly out of the recess upon the swinging of the main jaw in one direction. 20

In testimony whereof I affix my signature in presence of two witnesses.

ARTHUR H. WILSON. [L. s.]

Witnesses:

E. M. GREEDER,
D. H. HARPSTER.