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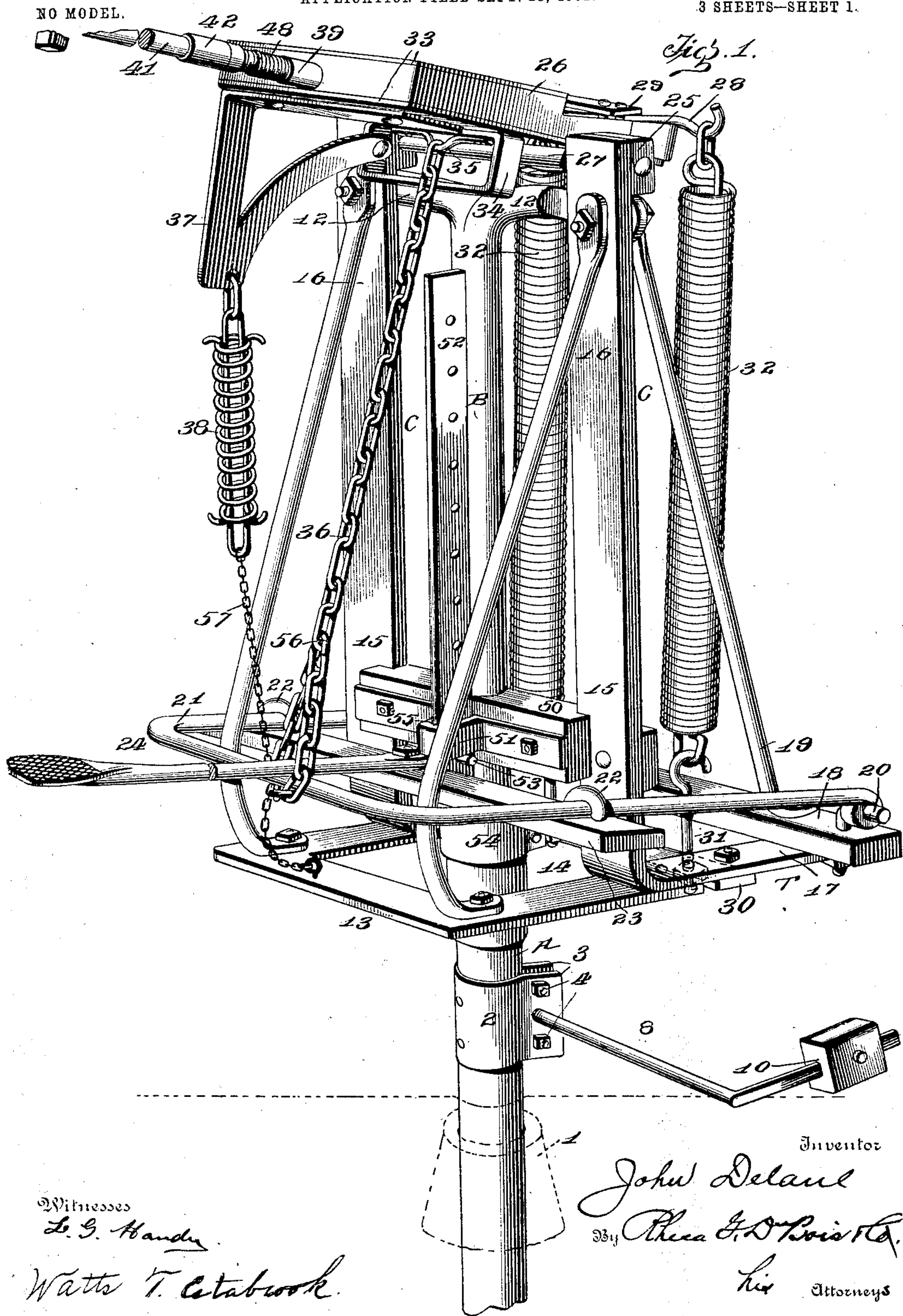
PATENTED MAR. 3, 1903.

J. DELANE.  
POWER HAMMER.

APPLICATION FILED SEPT. 23, 1901.

3 SHEETS—SHEET 1.

NO MODEL.



Witnesses

L. G. Handy

Watts T. Catabook

Inventor

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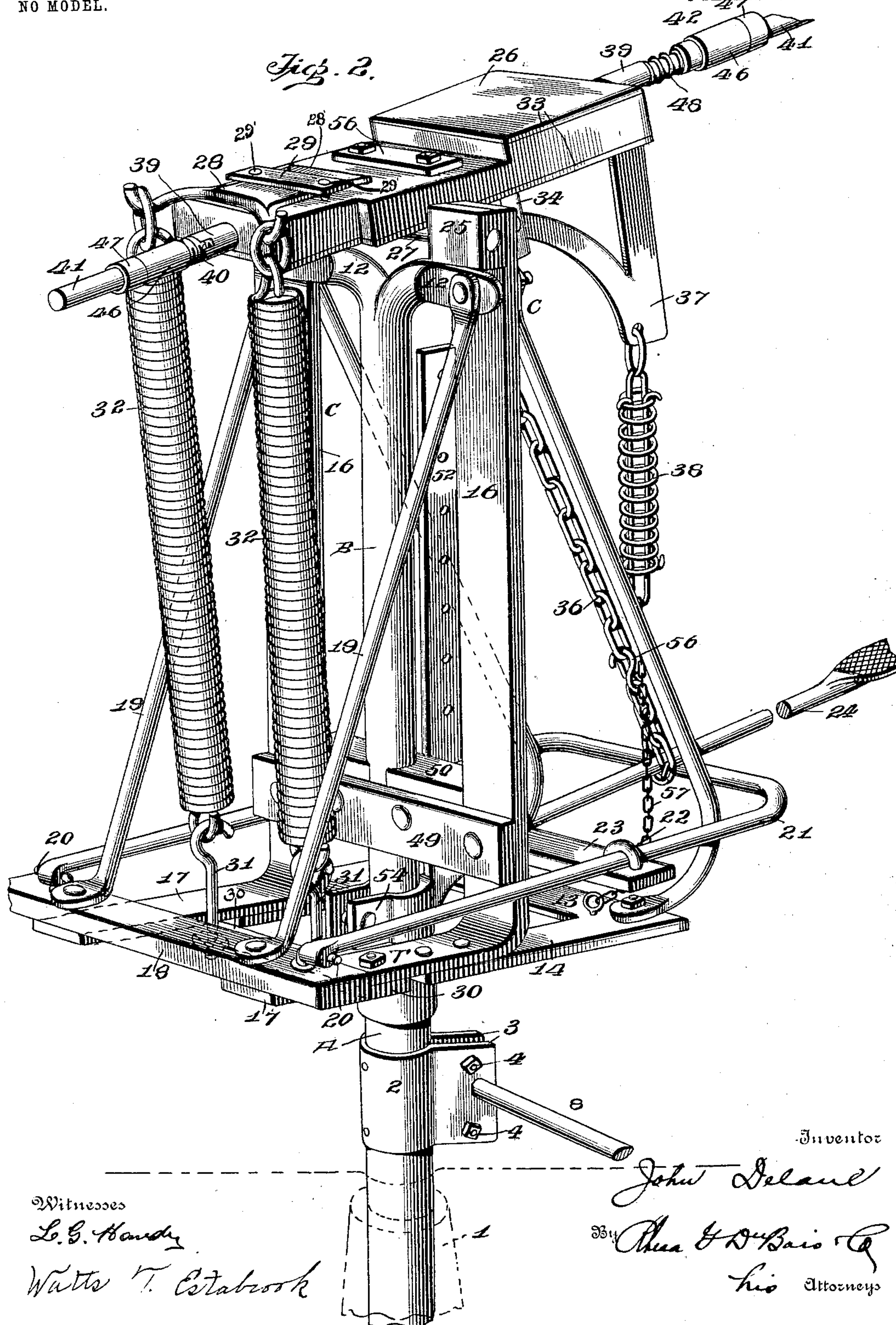
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3 SHEETS—SHEET 2.



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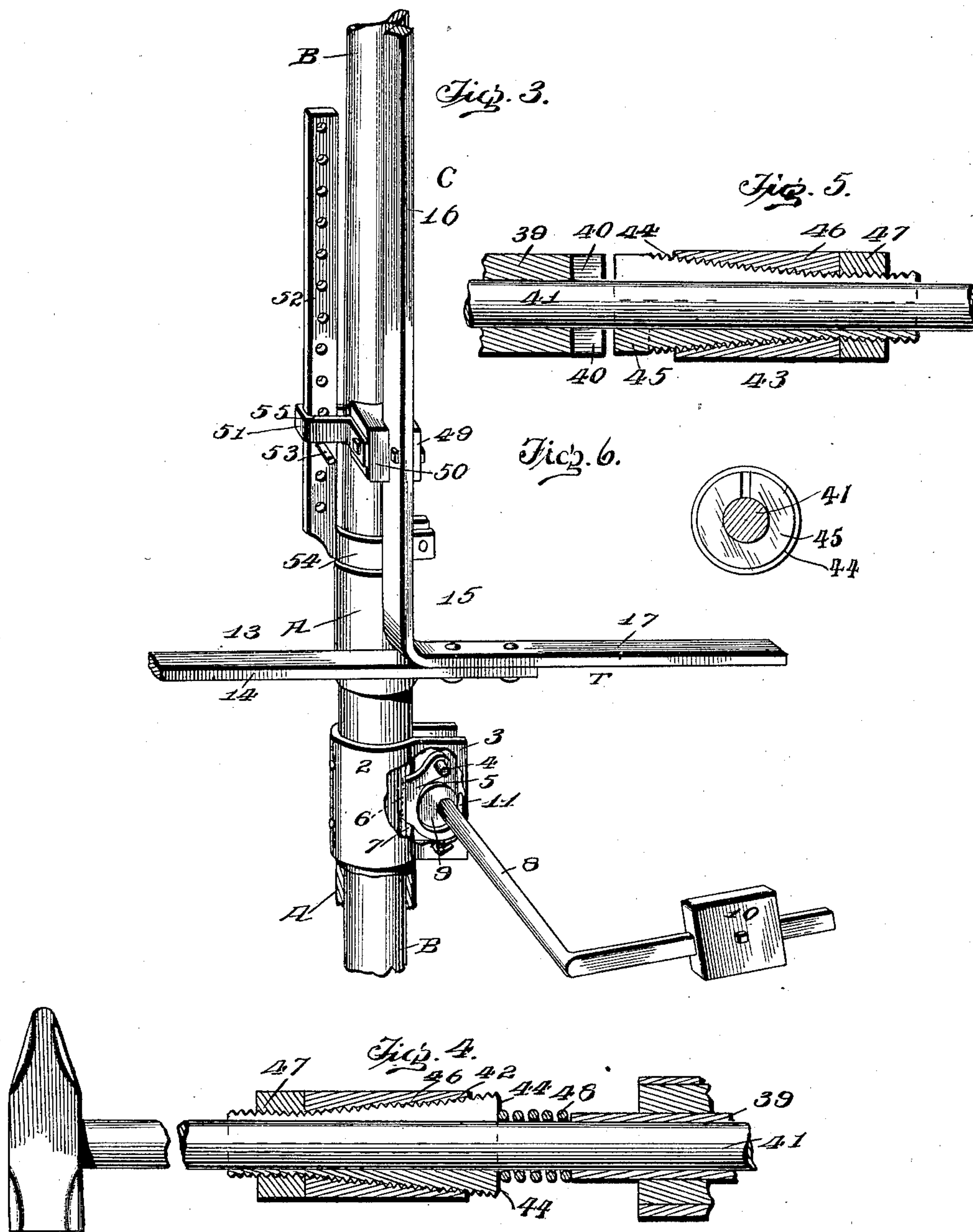
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# UNITED STATES PATENT OFFICE.

JOHN DELANE, OF BROKEN BOW, NEBRASKA.

## POWER-HAMMER.

SPECIFICATION forming part of Letters Patent No. 722,087, dated March 3, 1903.

Application filed September 23, 1901. Serial No. 76,244. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN DELANE, a citizen of the United States of America, residing at Broken Bow, in the county of Custer and State of Nebraska, have invented a new and useful Improvement in Power-Hammers, of which the following is a specification.

My invention relates to an improvement in power-hammers, and more particularly to that class of power-hammers technically known as "olivers."

The objects attained by my invention are, first, improved means whereby the force of the recoil of the hammer or other implement is transmitted into energy for effecting in part the succeeding stroke; second, the provision of a device whereby there is no dead-point; third, the provision of a mechanism capable of affording a wide range of adjustability at various heights and at various radii; fourth, the provision of means whereby to lock the device at any point in either of its adjustments; fifth, the provision of means whereby one face of the striking or other implement may be quickly and easily substituted for another, and, sixth, to provide means whereby the speed of the strokes may be regulated.

In order to obtain the foregoing objects, my invention consists in a frame secured to a post adjustably and pivotally supported in a socket, the frame in turn supporting a pivot-head suitably braced, which pivot-head is provided with tension devices, preferably springs, of differing strength on either side of the fulcrum of the head. The pivot-head is also provided with a sleeve adapted to receive the handle of the hammer or other implement, and the handle is provided with suitable devices, such as collars, whereby the handle may be removably secured in and to the sleeve.

In order to lock the frame at any desired height, I provide a means, to be hereinafter described, which is secured to the frame and having sliding connection with a suitable bar supported upon the upper end of the socket, and as a means for locking the post against undesirable rotation I provide a securing means located on the socket below the frame, which securing means is permitted access to

the post and is automatically retained in locked position.

My invention also consists in certain features and details of construction and combinations of parts, as will be more fully described hereinafter and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a perspective view of my invention. Fig. 2 is a perspective view taken from the side opposite to Fig. 1. Fig. 3 is a detail perspective view of the post and socket, parts being omitted and broken away to disclose the means for longitudinally adjusting the post and frame. Fig. 4 is an enlarged detail sectional view of one pair of the superimposed sleeves, disclosing the manner in which they are secured upon the handle of an implement. Fig. 5 is an enlarged detail view of the rear pair of sleeves showing the means of engagement with the pivot-head sleeve; and Fig. 6 is a detail end view of a pair of the superimposed slotted sleeves.

1 represents the support, within which a deep socket A is secured and rigidly fastened against movement in any direction. This support may be placed under the flooring, as shown, and the socket extends upward through a hole cut in the floor.

The socket A is hollow and preferably formed of metal, although it may be of any other suitable material, and it extends upward a short distance from the floor-line. Telescopically received within the socket is the post B, which may be composed of metal and may be inserted in or withdrawn entirely from the socket, as desired.

As a means for preventing accidental rotation of the post in the socket I provide the following adjustable and automatic locking means: Fitting about the socket A at a convenient height from the floor is an open collar 2, secured by means of rivets, bolts, or what not to the socket. The projecting wings 3 of the open collar are provided with apertures designed to receive adjustable bolts or screws 4 therein, whereby to tighten the collar about the socket. Upon one of these bolts 4 a peculiarly-formed hooked friction-shoe 5 is pivoted and adapted to swing thereon and having a flat inner face 6, which may be faced



with leather or other material. A slot 7 is formed in the socket opposite and designed to receive the face 6 of the pivoted shoe, which is by this construction permitted to have access to and contact with post B. A lever 8 is also pivoted in the wings 3 of the open collar a little to one side of the bolt 4, upon which shoe 5 is pivoted, and secured on this lever 8 between the wings 3 is an eccentric enlargement 9. The lever is of bell-crank form, and upon its outer or free arm a weight 10 is slidably secured, whereby to automatically retain the shaft in a lowered position. The eccentric 9 is so located on the lever that when the arm is lowered its widest diameter forces the face 6 of pivoted shoe 5 rigidly against the post B through the elongated slot 7 and holds it there. When the lever is raised, the eccentric is released from contact with the rear of face 6; but in revolving with the lever its widest diameter comes in contact with the hook-shaped end 11 of the shoe, thereby withdrawing face 6 from the slot 7 and unlocking the post B, permitting its revolution or raising in the socket. The weight may be adjusted on lever 8 to adjust the amount of frictional contact between the face 6 of shoe 5 and the post B. It is also evident that post B may be provided with longitudinal slots whereby to receive the face of the shoe, if desired.

Proceeding now, the post at its upper end is divided to right and left, the sections 12 12 being secured to a frame C by means of bolts. This frame is composed of a U-shaped body portion 13, the arms 14 of the body portion passing on either side of the post B. To the outer ends of these arms are secured by bolts or other means L-shaped pieces 15, their upright portions 16 extending upward on either side of the post B and their horizontal portions T extending away from the post B. The outer ends of these lateral portions are connected by a tie 18, secured thereto by bolts, which adds materially to the strength of the frame. Braces 19 extend from tie 18 and the outer corners of U-shaped portion 13 to the uprights 16, to which they are connected by bolts, the sections 12 12 of post B being secured to the uprights by the same bolts. Bent bolts 20 are secured to the tie 18, and hinged to these bolts by means of eye-holes at its ends is a treadle 21, its arms passing on either side of the post B. Secured by hook-bolts 22 to this treadle 21 near its closed end is a cross-bar 23, to the center of which the treadle-bar 24 is fastened, the outer end of the bar being flattened for placing the foot thereon.

To the ends of the uprights 16 bearing-boxes 25 are secured, their lower ends resting against braces 19, whereby a portion of the weight is supported thereby. A pivot-head 26 is held and supported in the bearing-boxes 25 by means of a pivot-shaft 27, secured to the under side of the head, its ends forming into journals receivable in the boxes. The pivot-

head operates between the uprights 16 and is provided at its rear end with a double saddle-hook 28, slidably secured to the pivot-head by means of clamp 29. The main body portion 28' of this hook is wedge-shaped and may be adjusted longitudinally beneath the clamp 29 when the latter is loosened, the sides of the wedge-shaped body portion binding against the studs 29', which fasten the clamp 29 to the pivot-head, whereby to prevent the entire disengagement of the saddle-hook and pivot-head and also to limit the longitudinal movement thereof. A cross-piece 30 is secured to the horizontal portion 17 of the L-shaped frame, and hooks 31 are loosely held therein by being bolted only on their lower ends, thus permitting a limited amount of play. Strong closely-coiled springs 32 connect the hooks 31 with T-hook 28, which operate to retain the pivot-head in a raised position with reference to the work.

The pivot-head may be provided with suitable metallic plates 33 upon its upper and lower faces, whereby to strengthen and prevent it from wearing.

On the under surface of the pivot-head, on the side opposite the springs 32, is an approximately rectangular leverage-frame 34, which, together with a loop 35, which is fastened to the inside surface of the upper portion of the frame, is secured to the pivot-head by means of bolts passing therethrough and through a block 56 on the upper face of the pivot-head, which block affords a larger bearing-surface for the tension brought to bear on the loop. This leverage-frame is located in front of the pivoted shaft 27, and an adjustable connection, consisting of a chain 36 or other flexible device, connects the loop and the U-shaped hinged frame 21, the chain passing under the frame 21 on either side of the treadle-bar 24, which retains the chain in position. A depending bracket 37 is secured to the under surface of the pivot-head near its forward end and also to the leverage-frame 34, and to this bracket is secured a recoil-spring 38, connected to the frame 13 by means of a chain 57 or other flexible device.

A sleeve 39 is secured in and longitudinally of the pivot-head 26 and projects slightly beyond at either end. At the rear end this sleeve is provided with a plurality of locking-recesses 40, preferably rectangular in shape. This sleeve is designed to receive and retain the handle 41 of a hammer or other implement which is inserted therein and extends outward from either end of the sleeve. The handle is provided with collars 42 43, rigidly secured forwardly and rearwardly, respectively, of the pivot-head. The collars 42 and 43 are constructed as follows: A split sleeve 44 is first placed on the handle, this sleeve tapering in diameter toward its rear end and provided with external screw-threads. It may also be internally threaded to enable it to bite into the handle, if desired. This sleeve 44 is also provided with a plurality of teeth



45, designed to be received in the recesses 40 of the sleeve 39. A collar 46, tapering in a direction opposite to that of the sleeve 44 and internally screw-threaded, is screwed upon the split sleeve, thereby causing it to grip the handle at any desired point, and a lock-nut 47 is screwed on the rear end of the split sleeve, holding everything tight.

A spring 48 is located between collar 42 and the sleeve 39, thereby drawing teeth 45 of collar 43 into the recesses 40 in the sleeve 39 and locking the handle against rotation. When it is desired to use another face of the tool, the handle is forced inward against the tension of spring 48 and then returned in the sleeve 39 to bring the other face into play. The handle is then released, and the spring once more forces the handle outward, bringing the teeth into the recesses and locking the handle.

Of course it will be noted that the length of the handle extending forwardly of the pivot-head can be adjusted by means of the removable and adjustable collars 42 43, which can be placed so as to compress spring 48 more or less, as desired.

As a means for adjusting and locking the frame on the post I provide the following mechanism: Secured to the uprights 16 is a cross-piece 49 for giving additional strength thereto. Located between these two uprights 16 and guided thereby is a plurality of blocks 50, having semicircular recesses formed in their adjacent ends, the semicircular recesses adapted to receive the post B therein. These blocks are bolted fast to the cross-piece 49. A loop 51 is secured to these blocks, and passing through the loop is an upright bar 52, perforated at intervals to receive a pin 53 therein. The lower end of this bar is provided with a split collar 54, which encircles the post B and rests upon the upper end of the socket A. A bolt connects the two open ends of the split collar, whereby it may be made fast to the post B, if desired.

When it is desired to raise the frame for the purpose of causing the face of the hammer to strike squarely on the anvil or high swages, the entire frame is lifted, it being guided in loop 51 and by block 50, surrounding post B, until the desired height is reached, whereupon the pin, which has been removed from one of the perforations in bar 52, is inserted in the one just underneath the loop 51, which may have a recess 55 formed therein to receive it, and thus support the frame in a higher plane than before. By means of this adjusting device any desired height may be obtained, and by means of the locking device hereinbefore described the hammer may be swung in a circle and operating on any of its radii, as necessary.

The operation of the device may be briefly described as follows: When it is desired to cause the hammer to strike a blow on the anvil, the operator places his foot on treadle-bar 24 and presses down sharply thereupon.

The impulse will be transmitted to the hinged frame 21, against which the treadle bears and to which it is connected. This will of course swing downward on its hinged connections with bar 18 and draw the chain 36, connected to the loop 35 on leverage-frame 34, thereby transmitting a downward impulse to the pivot-head 26 and hammer held thereby. This downward impulse of course extends the springs 32, which when the hammer has accomplished its stroke operate to return it to its raised position. The slack or play allowed in the double saddle-hook 28 and the hooks 31 with reference to springs 32 corresponds to the slack or play permitted by the chain 57, attached to the recoil-spring 38. The excessive strength of springs 32, combined with the play permitted them and the slack in the recoil-spring 38, greatly accelerates the speed or power of the hammer-stroke and also operates to cause the recoil-spring to start the succeeding downward stroke of the hammer after the rebound without the aid of the treadle. The recoil-spring also serves to prevent the forming of a dead-point during any position which the pivot-head may assume.

In order to avoid the disadvantage of raising the treadle to an uncomfortable height for operation when the frame is raised, I provide the chain 36 with a hook 56, adapted to take into any desired link in the chain 36, thus constituting an adjustable connection between the loop 35 and the treadle 24 and treadle-frame 21. By this means the treadle and treadle-bar may be allowed to remain at any desired height with respect to the floor-line by simply lengthening or shortening the chain as the frame is raised or lowered, which permits the treadle to swing downward on its pivots when the frame is raised and elevates the treadle when the frame is lowered, the treadle 21 being secured in such a manner to the tie 18 that the operator may produce a full stroke of the hammer without lifting his foot to an uncomfortable height.

It is evident that slight changes other than those hereinbefore noted might be made in the form and arrangement of the several parts described without departing from the spirit and scope of my invention, and hence I do not desire to limit myself to the exact construction herein set forth; but,

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A power-hammer provided with a slotted socket, a post revolvably and telescopically supported therein, supporting means on the socket, a single locking means pivoted in the supporting means, the locking means adapted to engage the post through the slot in the socket and a single means for causing the engagement of the locking means with and permitting its disengagement from the post.

2. A power-hammer comprising a frame, a



post to which the frame is secured, a slotted socket with which the post has revoluble and telescopic connection, a collar stationarily secured to the socket, a faced shoe pivotally supported in the collar, the shoe adapted to engage the post through the slot in the socket, an eccentric journaled in the collar and adapted to engage the shoe and means connected with the eccentric for normally causing the engagement of the shoe with the post, the means capable of being operated to cause the disengagement of the shoe from the post.

3. A power-hammer consisting of a frame, a post to which the frame is secured, a socket with which the post has revoluble and telescopic connection, a bar supported on the socket, means secured to the frame and having sliding connection with the bar, and devices removably secured to the bar whereby to support the frame when the latter is moved along the bar in either direction.

4. A power-hammer consisting of a frame, a post to which the frame is secured, a socket with which the post has revoluble and telescopic connection, a perforated bar supported by the socket, blocks secured to the frame, a loop secured to the blocks and having sliding connection with the bar, and a pin adapted to enter the aperture next below the loop whereby to retain the frame in any of its adjusted positions.

5. A power-hammer comprising a socket, a post held in the socket, a frame supported by the post, a bar supported by the socket, means secured to the frame and having sliding connection with the bar and devices engaging the bar at different points whereby the frame may be adjusted as to height.

6. A power-hammer consisting of a frame, a post to which the frame is secured, a pivot-head journaled in the frame, a sleeve recessed at one end and supported by the pivot-head, the sleeve adapted to receive the handle of any desired implement, collars adjustably secured on the handle, one of the collars provided with teeth to engage the recesses in the sleeve, and a tension device located on the handle and bearing against the opposite collar whereby to retain the teeth in engagement with the recesses to prevent the accidental turning of the handle.

7. A power-hammer consisting of a frame, a post to which the frame is secured, a pivot-head journaled in the frame, a sleeve recessed at one end and supported by the pivot-head, the sleeve adapted to receive the handle of any desired implement, collars adjustably secured on the handle, the collars composed of tapering split rings, oppositely-tapering nuts located thereon whereby to secure the split rings to the handle, one of the split rings provided with teeth adapted to engage the recesses in the sleeve, and a tension device operating against the opposite collar whereby to removably retain the teeth in engagement with the recesses, which construction permits

the handle to be revolved when desirable to present another face of the implement.

8. A power-hammer consisting of a frame, a post to which the frame is secured, a pivot-head journaled in the frame, a sleeve recessed at one end and supported by the pivot-head, the sleeve adapted to receive the handle of any desired implement, collars adjustably secured on the handle, the collars composed of tapering screw-threaded split rings, oppositely-tapering nuts screwed thereon whereby to secure the split rings to the handle, one of the split rings provided with teeth adapted to engage the recesses in the sleeve, and a tension device operating against the opposite collar whereby to removably retain the teeth in engagement with the recesses, and lock-nuts secured on the split rings.

9. A power-hammer comprising a revoluble and longitudinally-adjustable post, a socket in which the post is held, locking means on the socket for retaining the post in position, a frame supported on the post, a pivot-head fulcrumed in the frame, a treadle hinged to the frame, the post and frame removable from the socket when the locking means is released, an adjustable connection extending between the treadle and pivot-head, and separate tension devices connecting the pivot-head on either side of the fulcrum to the frame.

10. A power-hammer comprising a revoluble and longitudinally-adjustable post, a socket in which the post is held, locking means on the socket for retaining the post in position, a frame supported on the post, a pivot-head fulcrumed in the frame, a treadle hinged to the frame, a cross-bar secured to the treadle, a treadle-bar fastened to the cross-bar and extending beyond the outer end of the treadle, the post and frame removable from the socket when the locking means is released, an adjustable connection extending between the treadle and pivot-head, and separate tension devices connecting the pivot-head on either side of the fulcrum to the frame.

11. A power-hammer comprising a revoluble and longitudinally-adjustable frame, a pivot-head fulcrumed in the frame, a treadle hinged to the frame below the pivot-head, the treadle simultaneously rotatable and longitudinally adjustable with the frame, an adjustable connection extending between and connecting the pivot-head and treadle, tension devices loosely securing the frame and pivot-head on one side of the fulcrum thereof and elastic connection loosely connecting the pivot-head and frame on the opposite side of the fulcrum.

12. A power-hammer comprising a suitably-supported frame, a pivot-head fulcrumed therein, saddle-hooks secured to the pivot-head, bolts having loose and sliding connection with the frame, tension devices extending between and connected to the saddle-



hooks and bolts at their opposite ends whereby the tension means are permitted a slight play, a treadle pivoted to the frame and adjustable means extending between and connected to the treadle and pivot-head whereby to operate the latter.

13. A power-hammer provided with a rotatable and longitudinally-adjustable frame, a pivot-head fulcrumed thereon, a treadle hinged to the frame and rotatable and vertically adjustable therewith, tension means connecting the pivot-head and frame on one side of the fulcrum, the tension means loosely secured to the frame, a depending leverage-frame secured to and beneath the pivot-head on the opposite side of the fulcrum, a loose elastic connection secured to the lower end of the leverage-frame and to the frame, respectively, and longitudinally-adjustable means connecting the treadle and pivot-head.

14. A power-hammer comprising a frame, a treadle hinged thereto, a pivot-head journaled in the frame, a saddle-hook adjustably secured to the pivot-head, bolts loosely supported in the frame, springs connecting the hook and bolts, a bracket secured to the opposite end of the pivot-head, a recoil-spring suspended from the bracket, flexible means connecting the recoil-spring and the frame, and a connecting means between the pivot-head and treadle whereby when the treadle is rocked to operate the pivot-head.

15. A power-hammer comprising a frame, a pivot-head journaled therein, the pivot-head provided with an aperture extending therethrough and adapted to receive the handle of an implement, a plurality of means adjustably secured to those portions of the handle extending outside of the pivot-head and adjacent thereto, each of the adjustably-secured means comprising an inner compressi-

ble member and an outer member removably received upon the inner member to compress the latter, a tension device extending between one of the adjustable securing means and the pivot-head, the opposite adjustable securing means adapted to yieldingly engage the pivot-head.

16. A power-hammer comprising a frame, a post supporting the frame, a pivot-head journaled in the frame, means in the pivot-head adapted to receive the handle of any desired tool, locked means secured to the handle on either side of the pivot-head, and outside thereof, means located between one of the locked means and the pivot-head whereby to cause the engagement of the other locked means with the pivot-head to secure the tool in place.

17. A power-hammer consisting of a frame, a post to which the frame is secured, a pivot-head journaled in the frame, a sleeve recessed at one end and supported by the pivoted head, the sleeve adapted to receive the handle of any desired implement, collars adjustably secured on the handle, the collars composed of tapering split rings, opposite tapering nuts located thereon whereby to secure the split rings to the handle, one of the split rings provided with teeth adapted to engage the recesses in the sleeve, and a tension device operating against the opposite collar whereby to removably retain the teeth in engagement with the recesses, and lock-nuts secured on the split rings.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JOHN DELANE.

Witnesses:

MOSES LEWIS,  
ALPHA MORGAN.