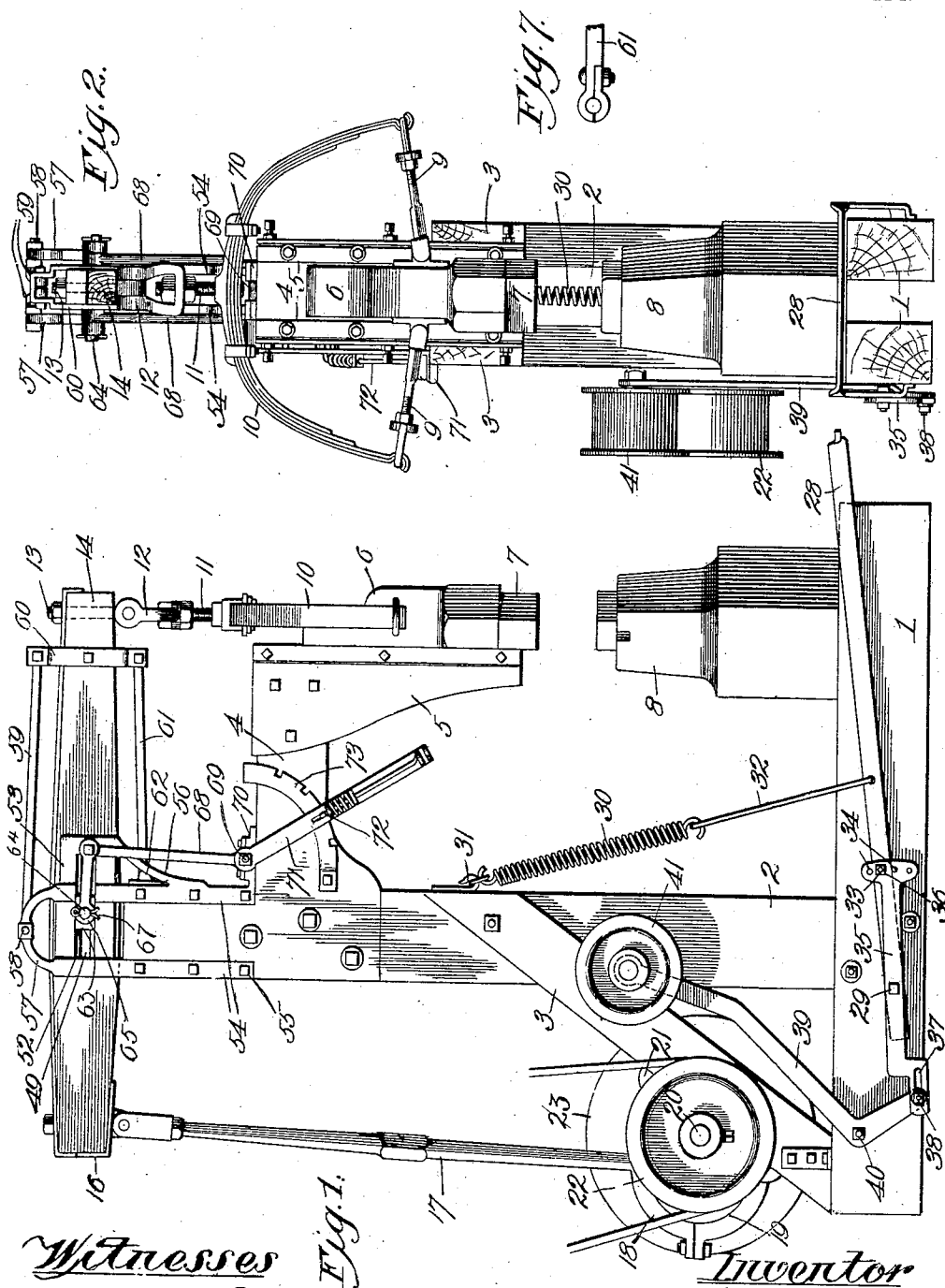


C. R. EMBRY.
POWER HAMMER.
APPLICATION FILED JAN. 4, 1909.

977,082.

Patented Nov. 29, 1910.

2 SHEETS—SHEET 1.



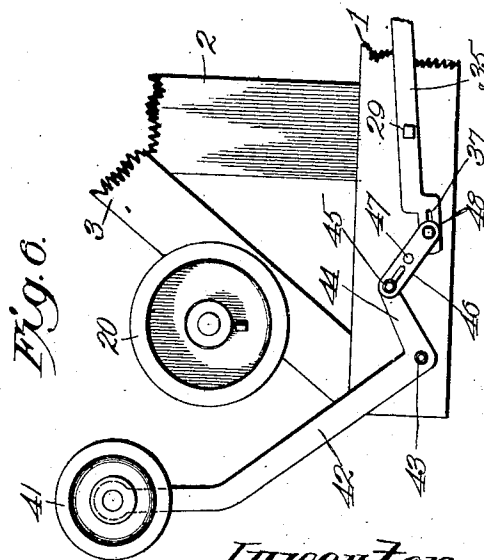
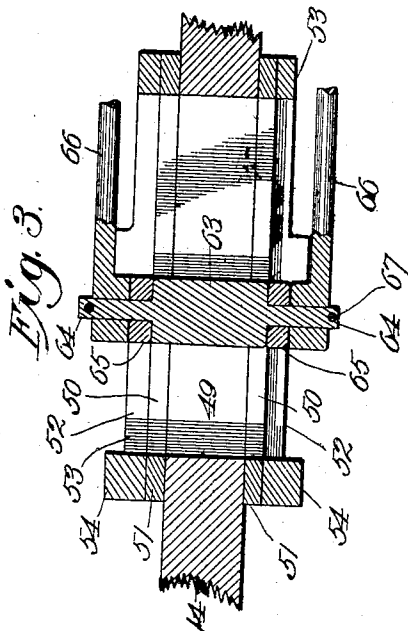
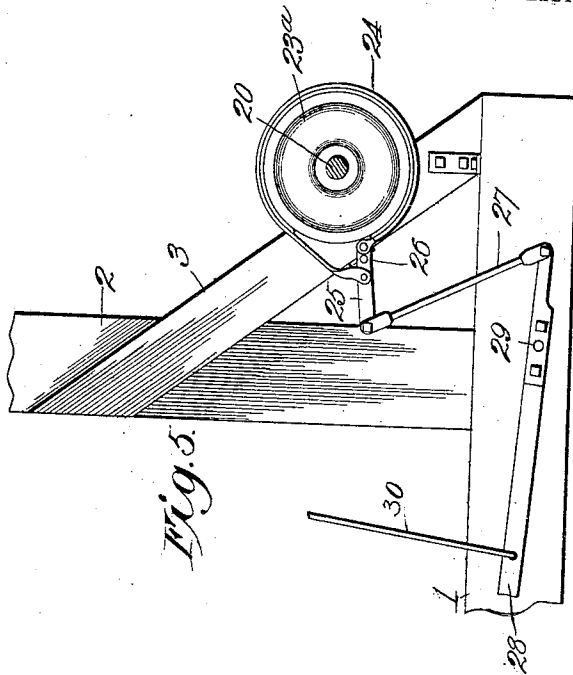
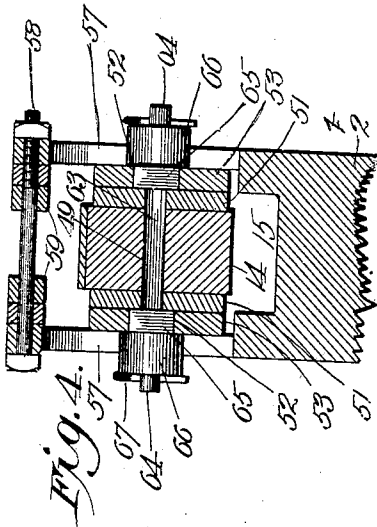
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2 SHEETS-SHEET 2.



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UNITED STATES PATENT OFFICE.

CLARENCE R. EMBRY, OF WAMEGO, KANSAS.

POWER-HAMMER.

977,082.

Specification of Letters Patent.

Patented Nov. 29, 1910.

Application filed January 4, 1909. Serial No. 470,711.

To all whom it may concern:

Be it known that I, CLARENCE R. EMBRY, a citizen of the United States, residing at Wamego, in the county of Pottawatomie and State of Kansas, have invented certain new and useful Improvements in Power-Hammers, of which the following is a specification.

This invention relates to power hammers and my object is to produce a hammer of this character which will perform its function reliably and by which blows may be struck of varying length and power to accommodate work of different character.

A further object is to produce a machine of this character which embodies simplicity, strength, and durability of construction, which can be controlled by a single operator and which is of comparatively inexpensive construction.

With these general objects in view the invention consists in certain novel and peculiar features of construction and organization as hereinafter described and claimed; and in order that it may be fully understood reference is to be had to the accompanying drawing, in which:—

Figure 1 is a side elevation of a power hammer embodying my invention. Fig. 2 is a front view of the same with the brake wheel mechanism and fly wheel omitted. Fig. 3 is an enlarged horizontal section taken centrally through the hammer-actuating lever with the ends of the latter broken away. Fig. 4 is a vertical section taken crosswise through the hammer-actuating lever, the slotted arms flanking the same, the adjustable fulcrum for the lever, and the upper part of the supporting standard. Fig. 5 is a side view of a part of the machine, disclosing the brake mechanism. Fig. 6 is an opposite side view of a part of the machine, disclosing a modified arrangement of the drive-belt tightening mechanism. Fig. 7 is an enlarged detail of a part of a link forming an element of the machine.

In the said drawing, 1 indicates a pair of parallel bars forming the base of the machine and 2 a standard forming the body of the machine, the standard being braced by inclined bars 3 connecting it to the base.

4 is an arm projecting forward from the standard and 5 are vertical guides depending from the front end of arm 4.

6 is a reciprocatory hammer mounted in guides 5 and provided at its lower end with

a preferably detachable hammer head 7 to strike an object resting upon the anvil 8 upon the front end of the base 1.

9 indicates links pivoted at their inner ends to hammer 6 and at their outer ends to the lower ends of an arc-shaped spring 10 attached centrally to a bolt 11 depending from a bail 12 pivoted to an eye-bolt 13 secured to the front end of a lever 14 overlying the standard 2 and adapted at times to play up and down in a recess 15 in the upper end of said standard. At its rear end the lever is provided with a bracket 16 to which is pivoted the upper end of the arm 17 of an eccentric strip 18 mounted upon an eccentric 19 secured to a shaft 20 journaled in bearings 21 carried by braces 3, said shaft being also equipped at one end with a pulley 22 to be driven by a belt 22^a, and at the other end with a fly-wheel 23 and a brake wheel 23^a encircled by a strap brake 24 secured at its ends to a lever 25 at opposite sides of its pivot 26, which lever is also connected by a link 27 to a U-shaped foot-lever 28 pivoted at 29 to base 1, the front end of the lever being held yieldingly upward normally, by a retractile spring 30 linked at its upper end to a hook 31 secured to the standard and at its lower end by an inverted V-shaped link 32 to the arms of the U-shaped lever. One of the arms of said lever is provided with an outwardly projecting bolt 33 engaging one of a series of holes 34 in the front end of a bar 35 secured reliably to the lever by one of the pivot bolts of the latter and by a nut 36 engaging the outer end of bolt 33. The bar 35 forms practically an adjustable extension of the lever and is made adjustable as explained so as to be capable of varying the throw of the belt tightener without requiring any adjustment of the fulcrum point of the foot-lever. The lever-extension 35 is provided with a longitudinal slot 37 wherein is adapted to play a pivot bolt or pin 38 projecting from the lower arm of an angle-lever 39 pivoted at 40 to the base and equipped at its upper end with a flanged idle-pulley 41. In the arrangement shown by Fig. 1, the depression of the foot lever swings the idle-pulley rearward to cause the same to engage and bend the slack side of the drive belt to tighten the latter. In the event that the slack side of the belt is the rear side a lever 42 equipped with idle-pulley 41 is pivoted at 43 and has an arm 44 projecting forwardly and upwardly from the pivotal point

and united by a pin-and-slot connection 45 with rock-bar 46 pivoted to the base at 47, the opposite end of said rock-bar having a pin 48 engaging the slot 37 of the extension 5 35 of said lever. The depression of the foot lever results in a forward movement of belt-pulley 41 until it engages the rear or slack side of and tightens the belt, as will be readily understood.

10 The lever 14 is provided with a longitudinal slot 49 which registers with a pair of similar slots 50 in a pair of wear-plates 51 secured to opposite sides of the lever in any suitable manner, slots 50 in turn communicating with wider slots 52 in a pair of frames 15 53 fitting flatly against the outer sides of wear-plates 51, said frames being provided with vertically-depending arms 54 bolted or otherwise secured as at 55 to the standard 2, it being noticed by reference to Fig. 1, that 20 frames 53 project beyond the front arms 54 and are connected to the latter by the inclined braces 56. Each frame is also formed with an arch 57 projecting above the lever 25 and pivoted at their rear ends to a cross-rod 58 connected to said arches, are links 59 pivoted at their front ends to a rock-frame 60 pivoted on the front end of lever 14, the lower end of said rock-frame being pivotally 30 connected by a link 61 to a bracket 62 secured to standard 2.

63 is a cross-bar of preferably oblong-rectangular form in cross section, extending through slot 49 and the similar slots 50 of 35 wear-plates 51, and provided at its ends with cylindrical stems 64.

65 indicates collars journaled on stem 64 and fitting slidably and snugly in the slots 52 of frames 53 and bearing against the outer 40 faces of wear-plates 51 and the ends of the rectangular cross-bar 63 to prevent endwise movement of the latter.

66 indicates a pair of links pivoted on the stems of said cross-bar and secured in position 45 thereon by spring-cotters 67. The opposite ends of said links are pivotally connected to the upwardly-projecting arms 68 of a shaft 69 journaled in bearings 70 cast integral by preference with slotted frames 50 53, and said shaft is provided with a lever 71 equipped with a spring-actuated dog 72 for engagement with a notched sector 73 secured to arm 4 of the standard.

Assuming that the belt is in operation 55 and it is desired to operate the machine, the person in charge presses the foot-lever downward by foot power and thus simultaneously releases the brake and tensions the belt, the latter result being followed by 60 rotation of shaft 20 and rocking movement of lever 14. As the front end of the lever moves downward it slides forward slightly on the cross-bar 63, the stems of which form the fulcrum points of the lever in such 65 movement, and as such rocking movement is

reversed the sliding movement also reverses. This longitudinal forward and back movement of the lever is caused by the rock-frame 60 carried by the lever and the links 70 59 and 61 pivotally connecting said rock-frame with the cross-rod 58 and bracket 62, it being noticed in this connection that said links 59 and 61 converge forward slightly 75 and when the lever is horizontal, links 59 are pitched downwardly and forwardly and links 61 upwardly and forwardly. As the front end of the lever moves downward links 59 which have a fixed pivotal point at their rear ends, in effect pull rearward on the upper end of rock frame 60, and at the 80 same time, link 61 in moving toward a horizontal position, pushes forward on the lower end of rock frame 60. As a result of these actions the central point of the rock-frame is shifted forward slightly and of course 85 moves the lever with it, these actions being reversed as the lever is rocked back to its original position. It will thus be seen that the front end of the lever practically moves up and down in a straight or undeviating 90 path. In its downward movement it is accompanied, of course, by the hammer, the spring 10 being employed to permit the hammer to move farther down after the corresponding movement of the front end 95 of the lever terminates. It also will yield in the event that the lever movement is longer than that of the hammer so as to avoid injury to any part of the machine. It furthermore is capable of yielding 100 slightly at the beginning of the up movement of the lever so as to gradually impose the weight of the hammer on the lever and thus avoid suddenly imposing the entire weight of the hammer on the belt, and in 105 this connection it will be noticed that the fly wheel effectively coöperates with the spring 10 in equalizing the strain on the belt. The downward and upward movement of the hammer continues until the 110 operator releases the foot-lever and permits spring 30 to reëlevate its front end and simultaneously withdraw the idle-pulley from the belt and apply the brake to the brake wheel. 115

If a shorter stroke of the hammer is desired it is accomplished by shifting the fulcrum point of the lever, viz., by adjusting cross-bar 63 forward in the slots 49, 50 and 52, through the instrumentality of lever 71, 120 the length of the stroke of the hammer being increased by adjusting said cross-bar rearwardly, as will be readily understood.

From the above description it will be apparent that I have produced a power 125 hammer embodying the features of advantage enumerated as desirable and which is susceptible of modification in the form, proportion, detail construction and organization of its parts without departing from the 130

principle of construction involved and embodied in the appended claims.

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

1. A power hammer, comprising a base equipped with an anvil and a standard, a vertically-reciprocatory hammer suitably supported above the anvil, a pair of parallel frames supported by the standard and provided with slots, a pair of collars fitting slidably in said slots, a lever arranged between said frames and provided with a slot communicating with but narrower than the slots of said frames, a cross-bar fitting slidably and nonrotatably in the slot of the lever and provided with cylindrical stems projecting from its ends through the said collars, means pivotally engaging said stems for securing said cross bar at the desired point of adjustment in the slot of the lever, connections linking the front end of the lever with said hammer, a rock-frame mounted on the lever and forwardly converging links pivoted at their front ends to the opposite ends of the rock frame and pivoted at their rear ends to points fixed with relation to the standard.

2. A power hammer, comprising a base equipped with an anvil and a standard, a horizontal transversely-arranged fulcrum bar suitably supported above the standard, a lever provided with a longitudinal slot through which said bar extends non-rotatably, means to adjust said bar longitudinally in the slot of the lever, a rock frame mounted on the lever near its front end, and forwardly converging links pivoted at their front ends to the upper and lower ends of said rock frame and bearing a fixed pivotal relation at their rear ends to the standard

and in planes above and below the lever, and a suitably guided hammer vertically above the anvil connected to the front end of the lever to move upward and downward there- 45 with.

3. A power hammer, comprising a base, an anvil and a standard thereon, a lever extending over the standard and suitably fulcrumed at a point above the same and at its front end overlapping the anvil, a suitably-guided hammer connected to the front end of the lever, a rock frame mounted on the lever near its front end, and a pair of links pivoted at their front ends to the upper and lower ends of the rock frame and pivoted at their rear ends at points fixed with relation to the standard and in planes above and below the fulcrum point of the lever. 50 55 60

4. A power hammer, comprising a base equipped with an anvil and a standard, a vertically-reciprocatory hammer suitably supported above the anvil, a pair of parallel frames supported by the standard and provided with slots, a pair of collars fitting slidably in said slots, a lever arranged between said frames and provided with a slot communicating with but narrower than the slots of said frames, a cross-bar fitting slidably and nonrotatably in the slot of the lever and provided with cylindrical stems projecting from its ends through the said collars, and links pivotally engaging said stems. 65 70 75

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

CLARENCE R. EMBRY.

Witnesses:

H. C. RODGERS,
G. Y. THORPE.