

No. 668,799.

Patented Feb. 26, 1901.

R. E. KIDDER.
POWER HAMMER.

Application filed June 21, 1897.

(No Model.)

2 Sheets—Sheet 1.

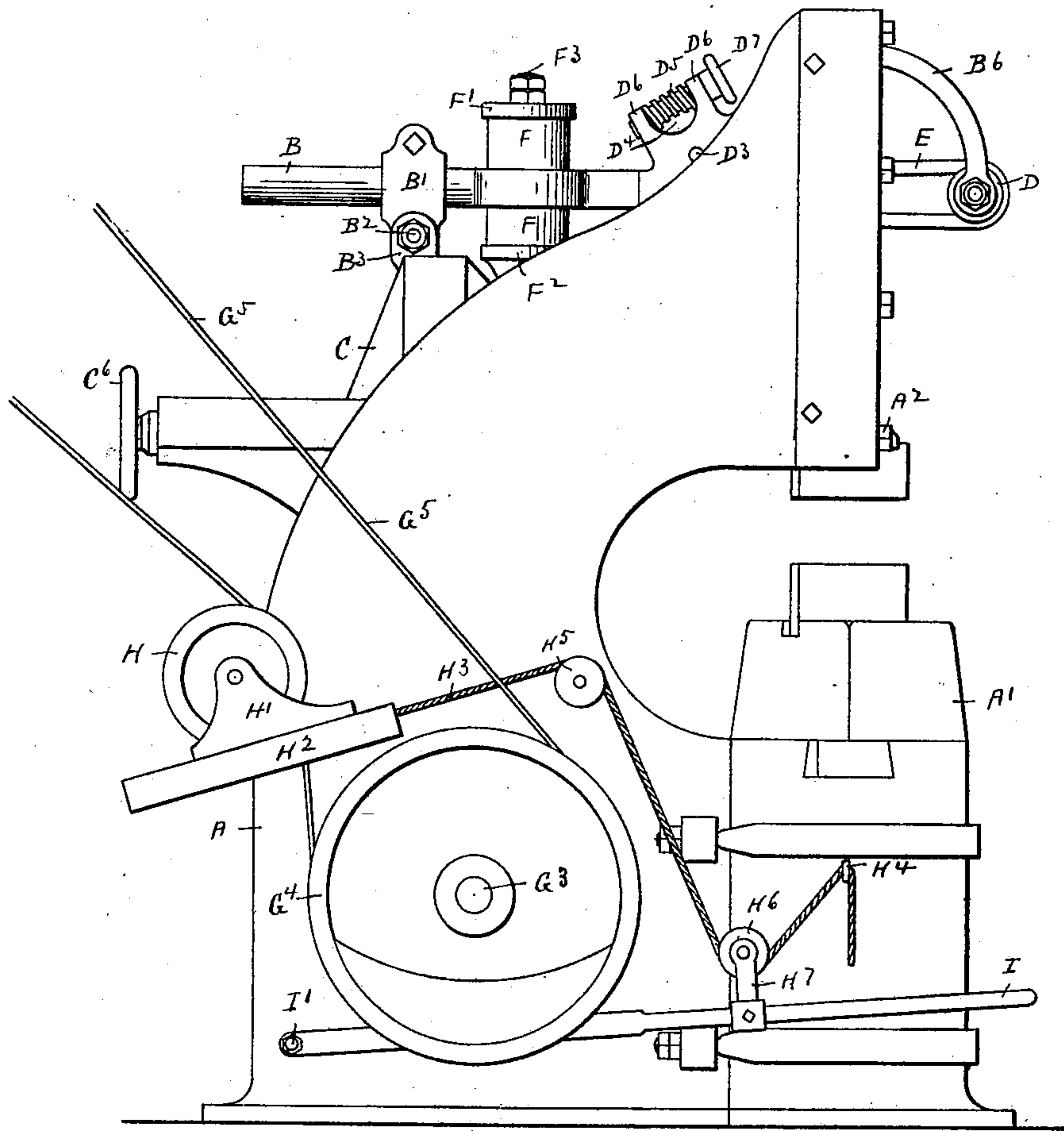


Fig. 1.

Witnesses
A. Whiting
W. Rice

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Richard E. Kidder
By his Attorney
Rufus B. Fowler

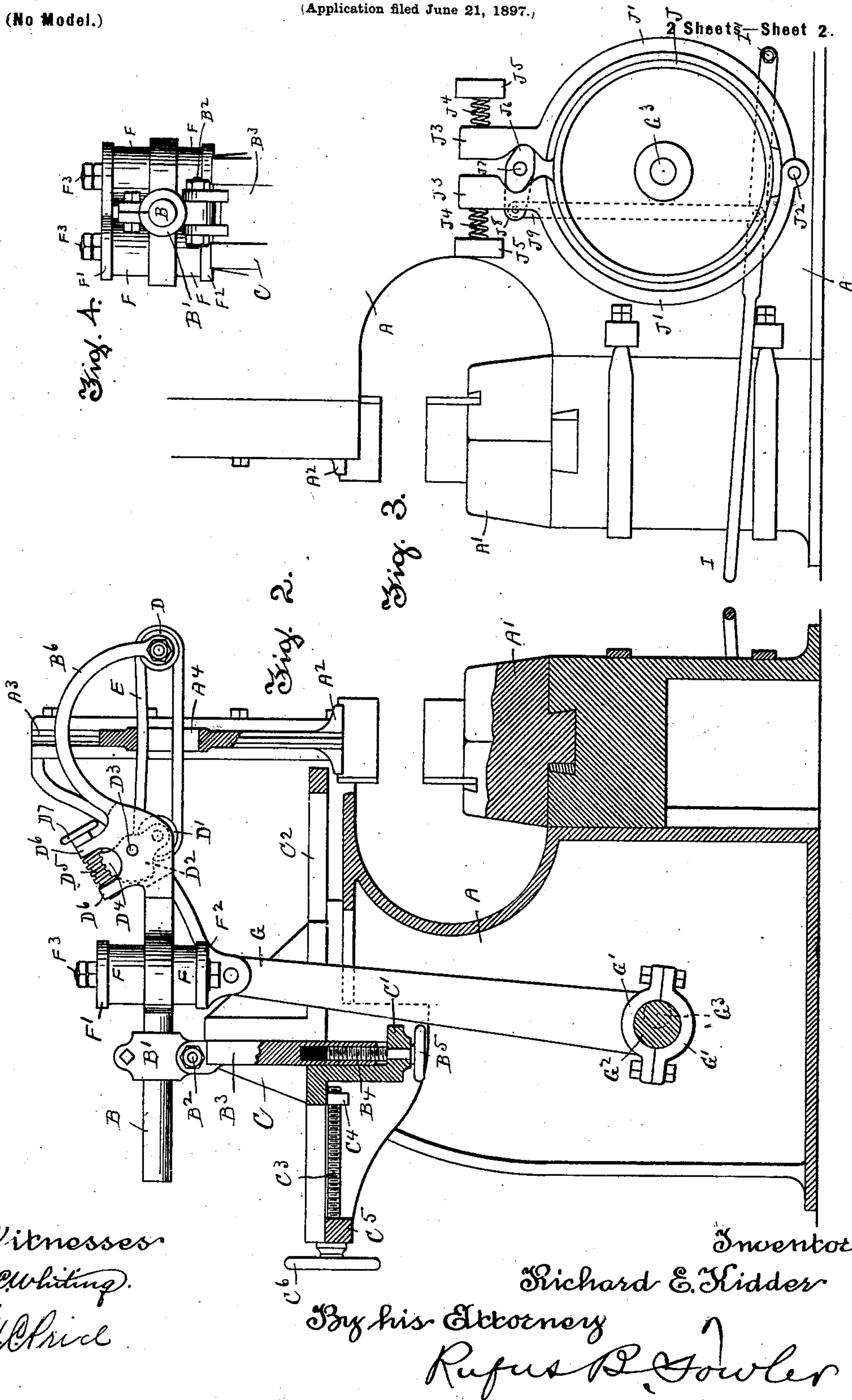
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UNITED STATES PATENT OFFICE.

RICHARD E. KIDDER, OF WORCESTER, MASSACHUSETTS.

POWER-HAMMER.

SPECIFICATION forming part of Letters Patent No. 668,799, dated February 26, 1901.

Application filed June 21, 1897. Serial No. 641,596. (No model.)

To all whom it may concern:

Be it known that I, RICHARD E. KIDDER, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Power-Hammers, of which the following is a specification, accompanied by drawings forming a part of the same, in which—

Figure 1 is a side elevation of a power-hammer embodying my invention. Fig. 2 is a side view shown in central vertical sectional view. Fig. 3 is a side view of the lower portion of the framework, showing the side opposite that represented in Fig. 1; and Fig. 4 is an end view of the hammer-helve and clamping-block.

Similar letters refer to similar parts in the different figures.

My invention relates to that class of power-hammers which comprise a pivoted helve and a vertically-reciprocating hammer connected with the helve by a flexible connection; and it has for its objects to provide improved means for varying the tension of the flexible connection between the hammer and the helve, to vary the stroke of the hammer-head, to vertically adjust the same, and to increase the efficiency and simplicity of the hammer by the novel construction and arrangement of the operative parts, as hereinafter described, and pointed out in the annexed claims.

Referring to the drawings, A denotes the framework by which the operative parts are supported.

A' denotes the anvil, and A² a reciprocating hammer-head capable of a vertically-sliding movement in ways A³.

B denotes the helve, which is clamped in a rocking frame B', pivoted at B² upon a plate B³, which is adjustable in vertical ways in the frame C by means of an adjusting-screw B⁴, which engages the plate B³ and is held from longitudinal movement in a bracket C', attached to the frame C. The screw B⁴ is provided with a hand-wheel B⁵, by which the plate B³ is raised or lowered. The frame C is capable of horizontal adjustment along ways C², supported by the framework A. The horizontal adjustment of the frame C is accomplished by means of an adjusting-screw C³, which engages a lug C⁴, projecting from the

frame C and is held from longitudinal movement in a bracket C⁵, attached to the framework A. The adjusting-screw C³ is provided with a hand-wheel C⁶, by which the frame C is adjusted along ways C².

By means of the adjusting-screws B⁴ and C³ the pivot B² of the helve B is capable of being adjusted both vertically and horizontally. The helve B is provided at its front end with a curved arm B⁶, which supports a sleeve D upon the front side of the hammer-head and in the same horizontal plane as a similar sleeve D', which is supported by a frame D², capable of a slight rocking motion upon a pivotal pin D³, held in the helve B. The frame D² is provided with a rack D⁴, curved concentrically with the pivotal pin D³ and engaged by a worm D⁵, held in lugs D⁶ D⁶, projecting from the helve B. The worm D⁵ is rotated by a hand-wheel D⁷ in order to rock the frame D² and carry the sleeve D' toward or away from the sleeve D. An endless strap E is carried around the sleeves D D' and passes through an opening A⁴ in the hammer-head, forming a flexible connection between the hammer-head A² and the helve B. The helve B is provided with springs F F in the usual manner, which are interposed between the helve and clamping-plates F' F², which are clamped together by bolts F³. The plate F² is pivotally connected to a link G, which is provided with eccentric-straps G', inclosing an eccentric G² on the main driving-shaft G³, by which a vibrating motion is imparted to the helve B.

One end of the shaft G³ carries a belt-pulley G⁴, by which power is imparted to the machine by a belt G⁵. The belt G⁵ is a loose belt, which is tightened when the hammer is operated by means of a tightening-pulley H, carried in a frame H', capable of sliding along the inclined ways H², attached to the frame A. A flexible connection H³, connecting the frame H' and a fixed eyebolt H⁴, passes over a pulley H⁵ to change its direction and beneath a pulley H⁶, journaled in arms H⁷, which are adjustably attached to a foot-treadle I, pivoted at I' to the frame A. When the foot-treadle I is depressed, the frame H' is drawn up the inclined ways H², carrying the pulley H against the belt G', and when the treadle I is released the frame H' is moved down the inclined ways H² by gravity, thereby loosen-

ing the belt. The opposite end of the shaft G^3 carries a brake-pulley J, which is inclosed by curved brake-arms $J' J'$, which are pivoted upon a fixed stud J^2 , held in the frame A.

5 The upper ends of the brake-arms J' are provided with lugs $J^3 J^3$, which are crowded together by spiral springs $J^4 J^4$, acting against lugs $J^5 J^5$, projecting from the side of the frame A, and serving to carry the brake-arms

10 $J' J'$ against the brake-pulley J. Between the lugs $J^3 J^3$ is a cam J^6 , capable of a rocking motion on a stud J^7 and provided with an arm J^8 , which is connected by a link J^9 with the foot-treadle I. When the foot-treadle I is de-

15 pressed for the purpose of tightening the pulley H, the cam J^6 is rocked, thereby separating the lugs $J^3 J^3$ against the tension of the springs J^4 and carrying the brake-arms J' out of contact with the brake-pulley J.

20 When the foot-treadle I is released, the downward movement of the frame H' and tightening-pulley H will raise the treadle, thereby rocking the cam J^6 and allowing the springs J^4 to carry the brake-levers J' into contact

25 with the brake-pulley J, causing the hammer to be stopped as soon as the driving-belt G^5 is released.

The helve B is clamped in the rocking frame B' , which is longitudinally adjustable

30 on the helve, so that the distance between the rocking frame B' , and the point at which power is applied to the helve through the connection G can be increased or decreased as desired in order to vary the stroke of the

35 hammer. When it is desired to increase the stroke of the hammer, the rocking frame B' is loosened upon the helve and the sliding frame C is moved toward the hammer-head, bringing the fulcrum of the helve nearer to

40 the point at which the power is applied, thereby causing the hammer-head A^2 to be raised higher at each vibration of the helve, while the movement of the frame C away from the hammer-head increases the leverage of the

45 helve between the fulcrum and the application of power and decreases the stroke of the hammer-head. In case the flexible connection E becomes stretched its slack is taken up by rocking the frame D^2 on its pivot D^3

50 by means of the rotating worm D^5 in order to carry the sleeve D' farther from the sleeve D.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a power-hammer, the combination of a

55 supporting-framework having ways for a vertical sliding plate, a vertically-sliding plate, means for vertically adjusting said plate along said ways, a rocking frame pivoted to said plate, a vibrating helve adjustably held

60 in said rocking frame, substantially as described.

2. In a power-hammer, the combination with the supporting-framework having horizontal ways, of a frame horizontally adjustable on said ways, said horizontally-adjust- 65

able frame having vertical ways, a plate vertically adjustable in said vertical ways, a frame pivoted to said plate and a helve held in said rocking plate and means for vibrating said helve, substantially as described. 70

3. In a power-hammer, the combination with a helve B, and rocking frame B' , of a vertically-adjustable plate B^3 , actuating-screw B^4 , said plate and screw being carried upon a frame C, a horizontally-adjustable frame C 75

and an actuating-screw C^3 , substantially as described.

4. In a power-hammer, the combination with a hammer-head and its helve B of a rocking frame B' pivoted upon a plate B^3 , a plate 80

B^3 held in the vertical ways of a frame C, an adjusting-screw B^4 by which said plate is raised or lowered in said frame, a frame C supported in horizontal ways in the framework of the machine and an adjusting-screw 85

C^3 by which said frame is horizontally adjusted, substantially as described.

5. In a power-hammer, the combination with a hammer-head and helve, of a flexible connection, whereby said helve is connected 90

with said hammer-head and consisting of an endless strap A supported upon sleeves D and D' , a rocking frame D^2 supporting the sleeve D' and pivoted in the helve B, said rocking frame having a rack D^4 curved concentrically 95

with its axis and a worm D^5 supported upon the helve B and engaging said rack, whereby said frame is rocked in order to vary the tension of the endless strap E, substantially as described. 100

6. In a power-hammer, the combination with a hammer-head and its helve, of a driving-shaft operatively connected with said helve, a pulley attached to said shaft and having a belt connection with the driving-pulley, 105

a pivoted foot-treadle, means for tightening the belt connection operatively connected with said foot-treadle, a drum attached to said driving-shaft, a pair of concentric brake-arms pivoted at one end and inclosing said 110

drum, springs applied to the opposite ends of said brake-arms to carry them into contact with the drum, a rocking cam by which the ends of said brake-arms are separated and means for connecting said rocking cam with 115

said foot-treadle, substantially as described.

Dated this 12th day of June, 1897.

RICHARD E. KIDDER.

Witnesses:

RUFUS B. FOWLER,
M. C. PRICE.