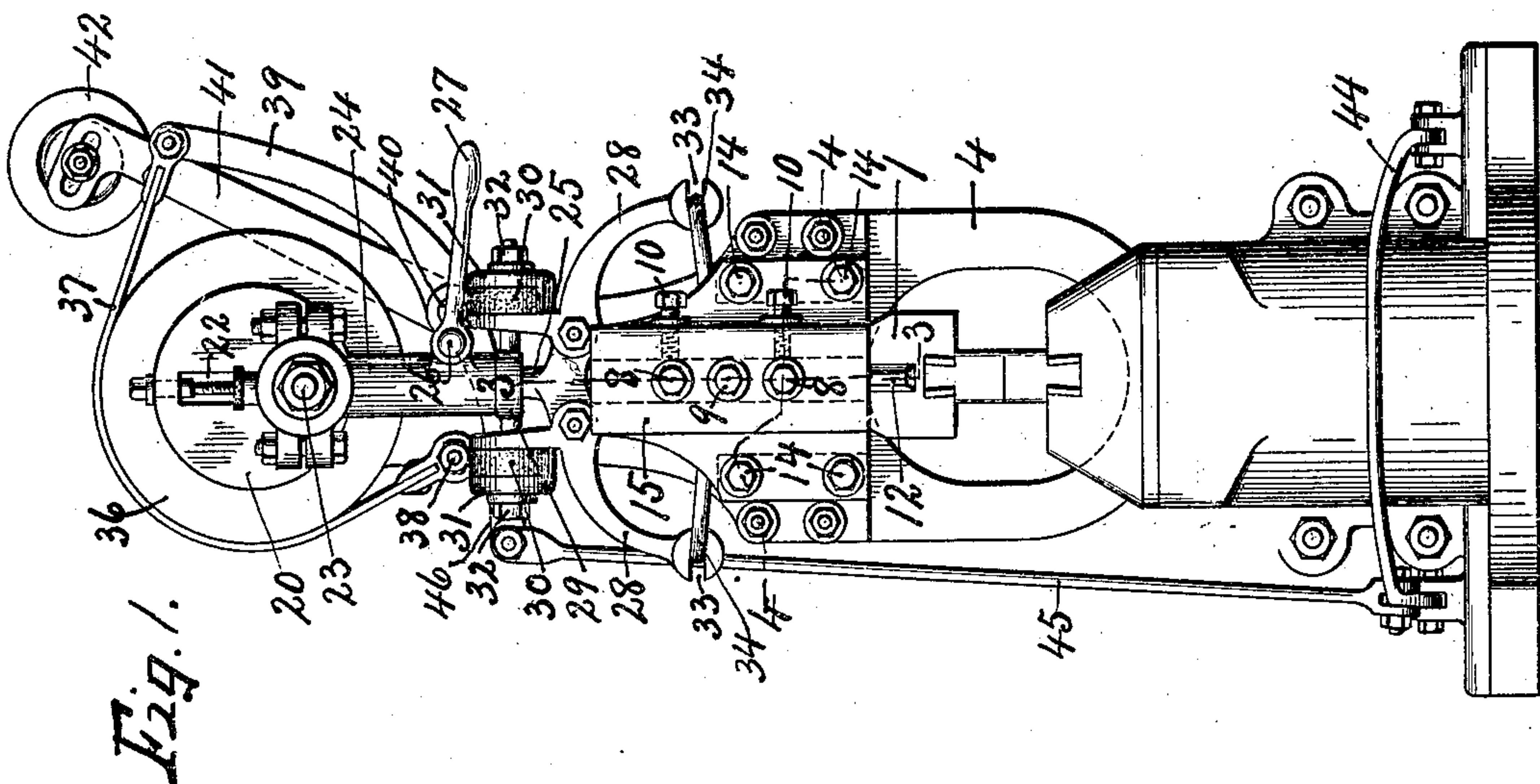
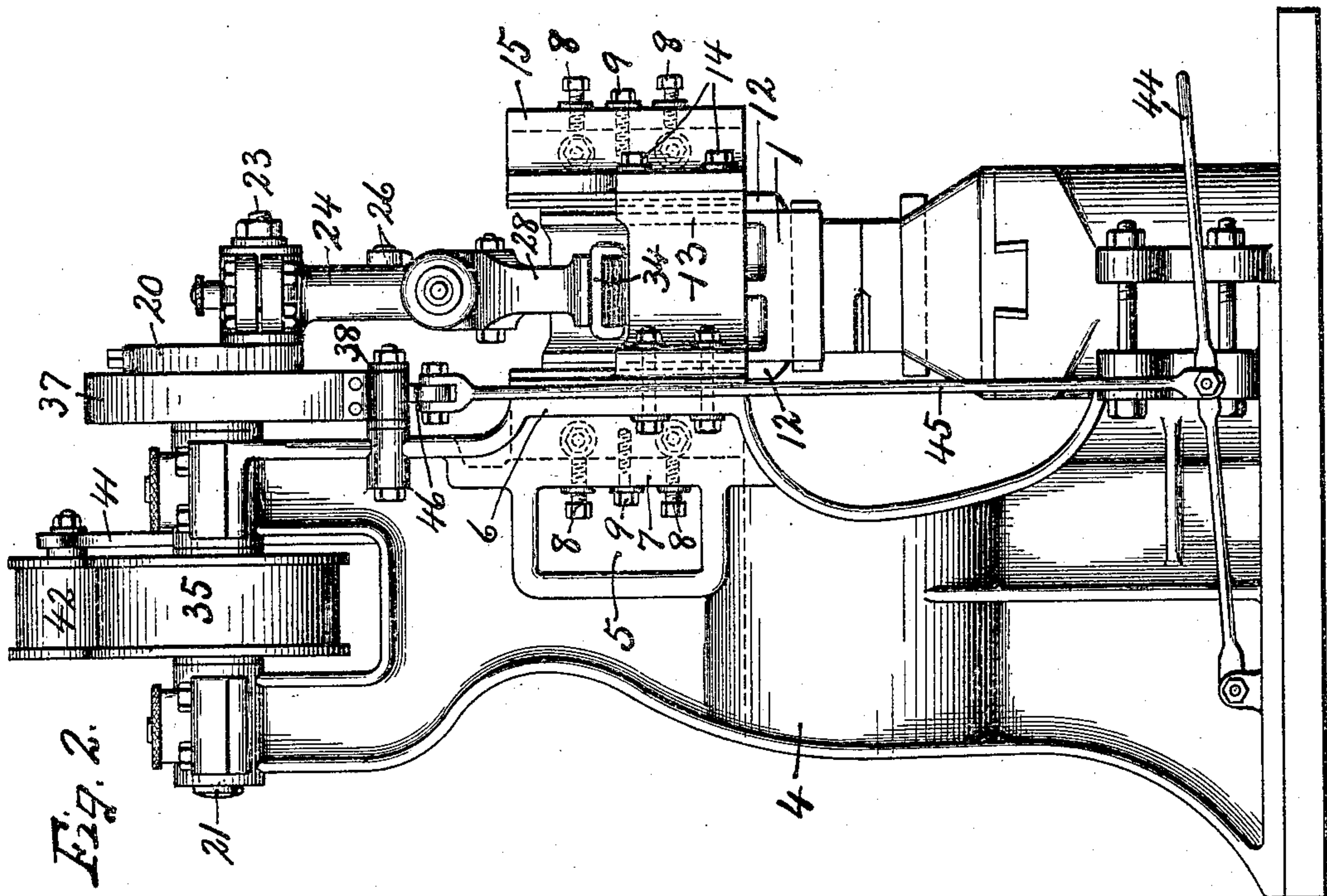


F. RAYMOND.
POWER HAMMER.
APPLICATION FILED OCT. 27, 1908.

934,355.

Patented Sept. 14, 1909.

2 SHEETS—SHEET 1.



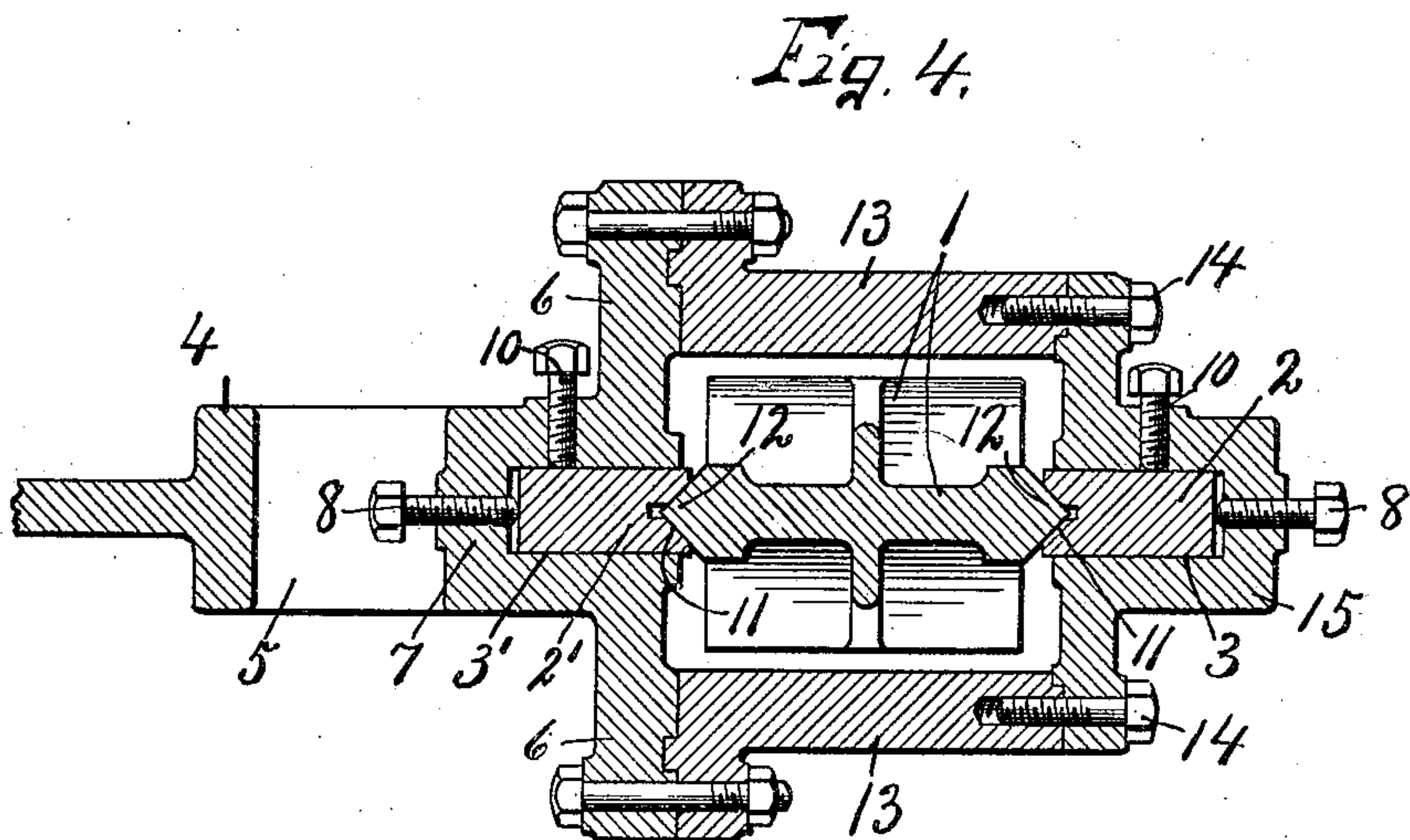
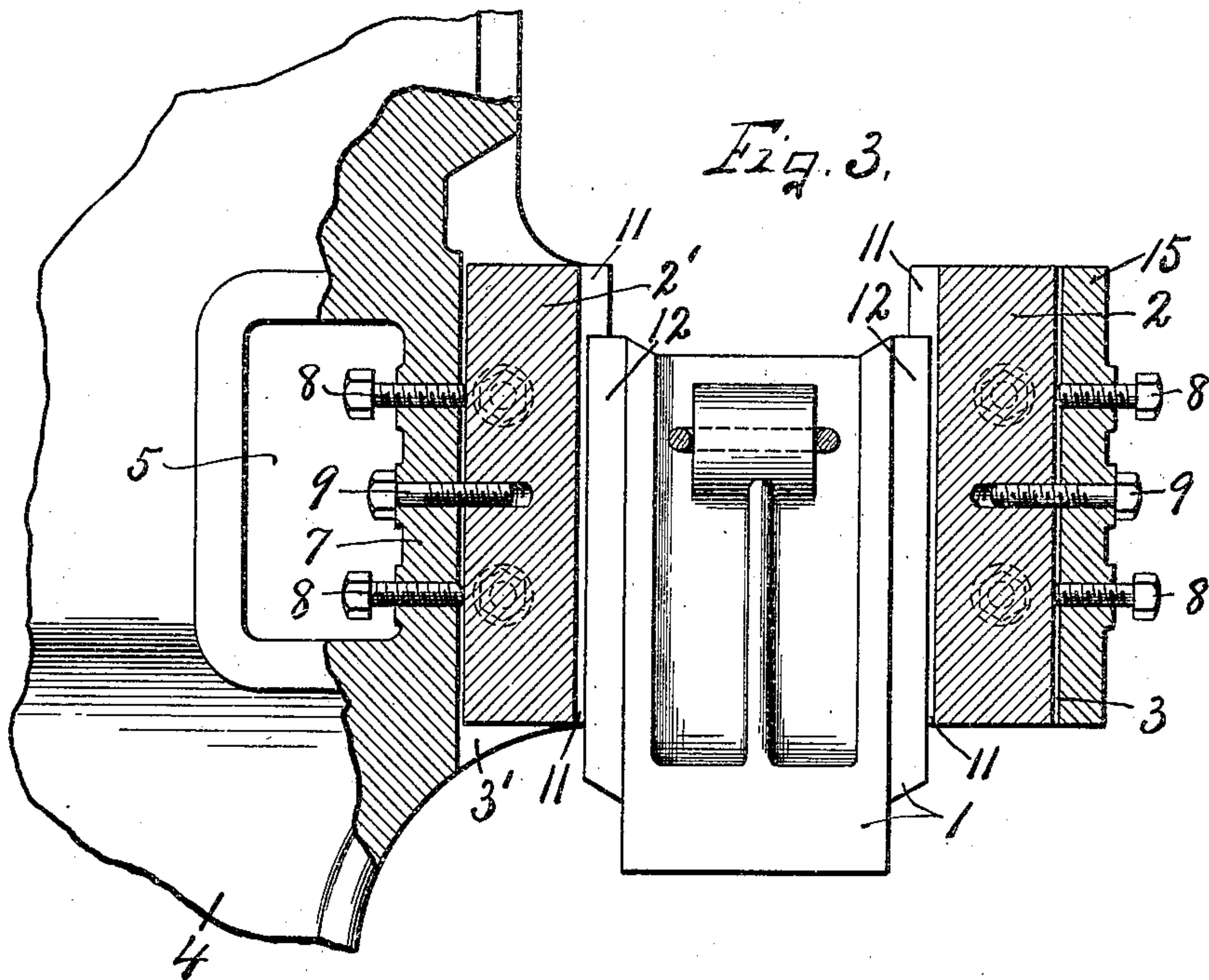
Witnesses:
H. C. Thomas
W. E. Chase

Inventor
Frank Raymond
By
Howard P. Arison
Atty

F. RAYMOND.
POWER HAMMER.
APPLICATION FILED OCT. 27, 1908.

934,355.

Patented Sept. 14, 1909.
2 SHEETS—SHEET 2.



Witnesses:
J. B. Thomas
W. E. Chace

Inventor
Frank Raymond
By
Howard P. Benson
Atty

UNITED STATES PATENT OFFICE.

FRANK RAYMOND, OF SYRACUSE, NEW YORK.

POWER-HAMMER.

934,355.

Specification of Letters Patent. Patented Sept. 14, 1909.

Application filed October 27, 1908. Serial No. 459,721.

To all whom it may concern:

Be it known that I, FRANK RAYMOND, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Power-Hammers, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to certain improvements in power hammers in which the head carrying a suitable die is reciprocated along suitable ways toward and from the coacting die of an underlying anvil upon which the metal to be operated upon is placed.

In devices of this character in which various forms of dies are used, it is necessary to maintain accurate relation of the coacting faces of the dies or in other words to maintain exact alinement between the reciprocatory hammer head and anvil. This hammer head is necessarily reciprocated very rapidly and must, therefore, move freely in its ways, and still be held firmly against lateral movement in order to preserve the alinement and exact coaction of the dies. This rapidity of movement together with the strains to which the hammer head is subjected necessarily produces more or less wear between the head and its guide ways and unless some provision is made to take up the lateral play incidental to such wear the dies are soon thrown out of alinement and excessive strains brought upon the wrist pin and other connections between the hammer head and driving shaft.

My object, therefore, is to provide a convenient means for adjusting one or both of the ways so as to maintain a perfect sliding fit between the hammer head and ways throughout the entire length of the latter and at the same time to rigidly lock such way or ways in their adjusted position. It is not, therefore, a mere adjustment of the ways but also the locking of such ways against endwise or rocking movement in their respective seats which I have sought to accomplish.

Other objects and uses relating to the manner of lining up the ways and hammer head will be brought out in the following description.

In the drawings—Figures 1 and 2 are respectively a front elevation and a side elevation of a power hammer embodying the various features of my invention. Figs. 3

and 4 are enlarged sectional views taken respectively on lines 3—3 and 4—4, Fig. 1.

In carrying out the objects stated, a vertically movable reciprocatory hammer head —1— is guided at its front and rear edges in adjustable ways —2— and —2'— which in turn are seated with a snug sliding fit in recesses —3— and —3'— in portions of the main supporting frame in which the hammer head is movable. This supporting frame comprises an upright portion —4— having a suitable base adapted to rest upon a solid foundation, the intermediate portion of the upright —4— is provided with a transverse opening —5— and directly in front of this opening is formed with laterally projecting flanges —6— and the vertical recess or channel —3'— in which the guide way —2'— is adjustable leaving a connecting web —7— of metal between the back of the channel —3'— and opening —5— for the reception of a plurality of, in this instance two, adjusting screws —8— and an intermediate clamping screw or bolt —9— whereby the guide way —2'— may be adjusted and clamped in its adjusted position although in some instances I may prefer to provide additional side clamps, bolts or set screws —10— as best seen in Fig. 4.

The opening —5— is of sufficient transverse depth to permit the adjusting bolts —8— and clamping bolt —9— to be entirely removed or reinserted in their respective threaded apertures in the web —7— which apertures are located one above the other in alinement with the longitudinal center of the back of the guide way —2'—.

The channel or groove —3'— and its corresponding guide way —2'— which are of substantially the same vertical length or height extend short distances above and beneath the lower sides of the opening —5— and substantially equal distances above and below the upper and lower adjusting screws or bolts —8— while the clamping screw —9— is located substantially midway between the adjusting screws —8— and therefore, substantially central or midway between the upper and lower sides of the guide way —2'—, the latter being tapped to receive the inner end of the clamping screw or bolt —9— as best seen in Fig. 3.

The adjusting screws —8— which are engaged in threaded apertures in the web —7— of the upright —4— bear at their inner ends

against the rear face of the guide way —2'— and serve as means for adjusting said guide way into closer engagement with the adjacent side of the vertically movable hammer head —1— while the clamping screw or bolt —9— serves to draw the guide way —2'— firmly against the inner ends of the adjusting bolts to lock said guide way in its adjusted position, it being understood that during the adjustment of the guide way —2'— it is necessary to loosen the clamping bolt —9—.

When the guide way —2'— is properly adjusted, it may be additionally clamped in place by the side bolts or screws —10— of which there are, in this instance two, located in substantially the same plane as the set screws —8— but at substantially right angles thereto as best seen in Fig. 4. This guide way —2'— is formed on its inner face with a vertical groove —11— which is V-shape in cross section for receiving a corresponding V-shape rib —12— on the adjacent upright side of the vertically movable hammer head —1—, thereby centering the head with reference to its guide way and at the same time affording a comparatively broad bearing transversely.

Secured to the front face of the flanges —6— and projecting forwardly therefrom are upright side pieces or brackets —13— spaced apart a sufficient distance to permit the free play of the hammer head —1— between them, said brackets or side pieces being extended a short distance beyond the front side of the hammer head, and, to the front edges of these brackets or side pieces is secured, by suitable fastening means as bolts —14—, a cap —15— which together with the brackets —13— and flanges —6— form a suitable housing in which the hammer head is movable.

The recess or channel —3— in which the guide way —2— is adjustable is formed in the head —15— and together with the guide way —2— are of substantially the same dimensions as the opposite channel —3'— and its guide way —2'—. This guide way —2— like the guide way —2'— is provided on its inner face with a lengthwise vertical groove which is V-shape in cross section and receives a similarly shaped rib —12— on the adjacent upright edge of the hammer head —1—, said guide —2— being adjustable horizontally by a pair of adjusting screws —8— and is clamped in its adjusted position by a clamping screw or bolt —9—, said adjusting screws and clamping bolt being similar to those previously described for the opposite guide —2'— and are similarly located relatively to each other, the guide —2— being additionally held in its adjusted position by set screws —10— similar to those previously described. It is now clear that the guides —2— and —2'— may not only

be adjusted to take up wear but this adjustment enables the hammer head to be brought into perfect alinement with the vertical axis of the anvil so as to maintain perfect registration of the dies and in addition to this by locating the adjusting screws —8— above and beneath the clamping screw I am enabled to hold the upper and lower ends of the guide ways —2— and —2'— firmly against lateral thrust and to maintain perfect contact between the guides and sliding hammer head throughout the entire length of the guides thereby steadying the action of the hammer head and retaining the latter in perfect alinement in any position of its movement so that the dies will operate as accurately upon small work as upon large work. This adjustment, therefore, becomes extremely valuable in its association in power hammers in which yielding buffers are employed in the connection between the hammer head and its actuating means. For example, I have shown this actuating means as consisting of an eccentric disk —20— which is secured to a power driven shaft —21— and is provided with a radial slot —22— in which is adjustable one end of a wrist pin —23—, the latter being journaled in one end of a tubular connecting rod —24— having an adjustable extension —25— in its lower end, the rod being held in place by a clamping bolt and nut —26— which is operated by a lever —27—.

Pivoted to the lower end of the extension —25— are opposed bell crank levers —28— located equi-distant from and at opposite sides of the axis of the connecting rod —25— and having their upright arms slidable upon the radial extensions of a yoke —29— which is mounted upon the extension —25— just above the pivots of the bell crank levers —28—.

The outer faces of the extensions of the upright arms —28— abut against elastic buffers —30— on the opposite arms of the yoke —29—, said buffers being held in place by washers —31— and clamping nuts —32— engaging the outer threaded arms of the yoke —29—.

The lower arms of the levers —28— are provided with open sided slots —33— receiving corresponding ends of links —34— which in turn are connected in open sided slots in the upper side of the head.

The bell crank levers are adjusted by the clamping nuts —32— and buffers —30— so as to exert a lateral pull upon the links —34— and together with said links and buffers establish yielding connection between the connecting rod and hammer head by which said hammer head is reciprocated vertically as the eccentric —20— is rotated so that when the die on the hammer head is brought into engagement with the same or different thicknesses of work on the anvil

the hammer head will be brought to a stop while the throw of the connecting rod and its actuating means will remain the same.

The shaft —21— is provided with a driving pulley —35— and brake drum —36—, the pulley —35— being adapted to be connected by a belt to any available source of power, not shown, while the brake disk —36— is adapted to be engaged by a brake strap —37— having one end anchored at —38— to the main supporting frame and its other arm connected to a rock arm —39— on a rock shaft —40—. This rock shaft is provided with an additional arm —41— carrying an idle belt tightening pulley —42—.

The rock shaft —40— is adapted to be operated to throw the tightening pulley —42— into engagement with the belt and to simultaneously release the brake strap —37— by means of a foot lever —44— and link —45— which connects said foot lever with a crank-arm —46— on the rock-shaft —40—, the latter being returned to its starting position by the gravity of the tightener —42— which also throws the brake shoe —37— into operative engagement with the disk —36— to stop the machine when the pedal lever is released.

Although I have described practically the entire machine, the principal feature of my invention lies in the particular means for taking up the wear between the sliding hammer head and its ways and for maintaining the perfect alinement of said hammer head and its die with the anvil and corresponding die thereon.

What I claim is:

1. In a power hammer, an upright frame having a vertical channel opening from its front face and provided with a transverse opening at the rear of the channel leaving

a web between the back of the channel and opening, a guide way adjustable horizontally in said channel, adjusting screws for the guide way passing through said web and engaging the back of the guide way, a clamping screw also passed through the web and engaging the guide way to hold the latter against the inner ends of the adjusting screws, an additional vertical guide way spaced apart some distance from and parallel with the first named guide way, a hammer head movable vertically in said guide ways, and means for reciprocating said hammer head.

2. In a power hammer, an upright frame having a vertical channel in its front face, and a transverse opening at the rear of the channel leaving an intervening web forming a part of the frame, a guide block adjustable horizontally in said channel, adjusting screws tapped in the web and having their inner ends engaging the rear of the guide block and their outer ends projecting into said opening, means for clamping the guide block in its adjusted position, brackets projecting from the front face of the frame and opposite sides of the channel, a cap secured to the front ends of the brackets and provided with a vertical channel, an additional guide block adjustable horizontally in the last named channel, means to clamp the adjustable guide block in its adjusted position, a vertically movable hammer head guided in the guide block, and means for actuating said hammer head.

In witness whereof I have hereunto set my hand this 21st day of October 1908

FRANK RAYMOND.

Witnesses:

H. E. CHASE,
C. M. McCORMACK.