

J. C. BUTTERFIELD.

Power-Hammers.

No. 144,059.

Patented Oct. 28, 1873.

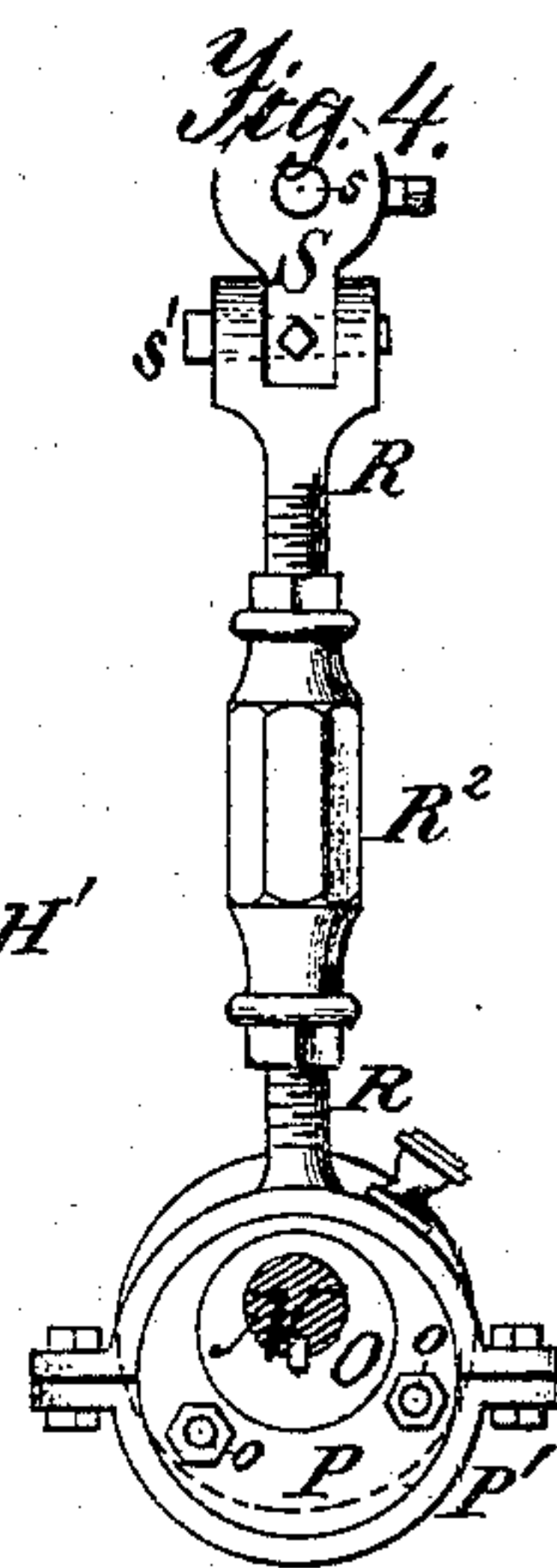
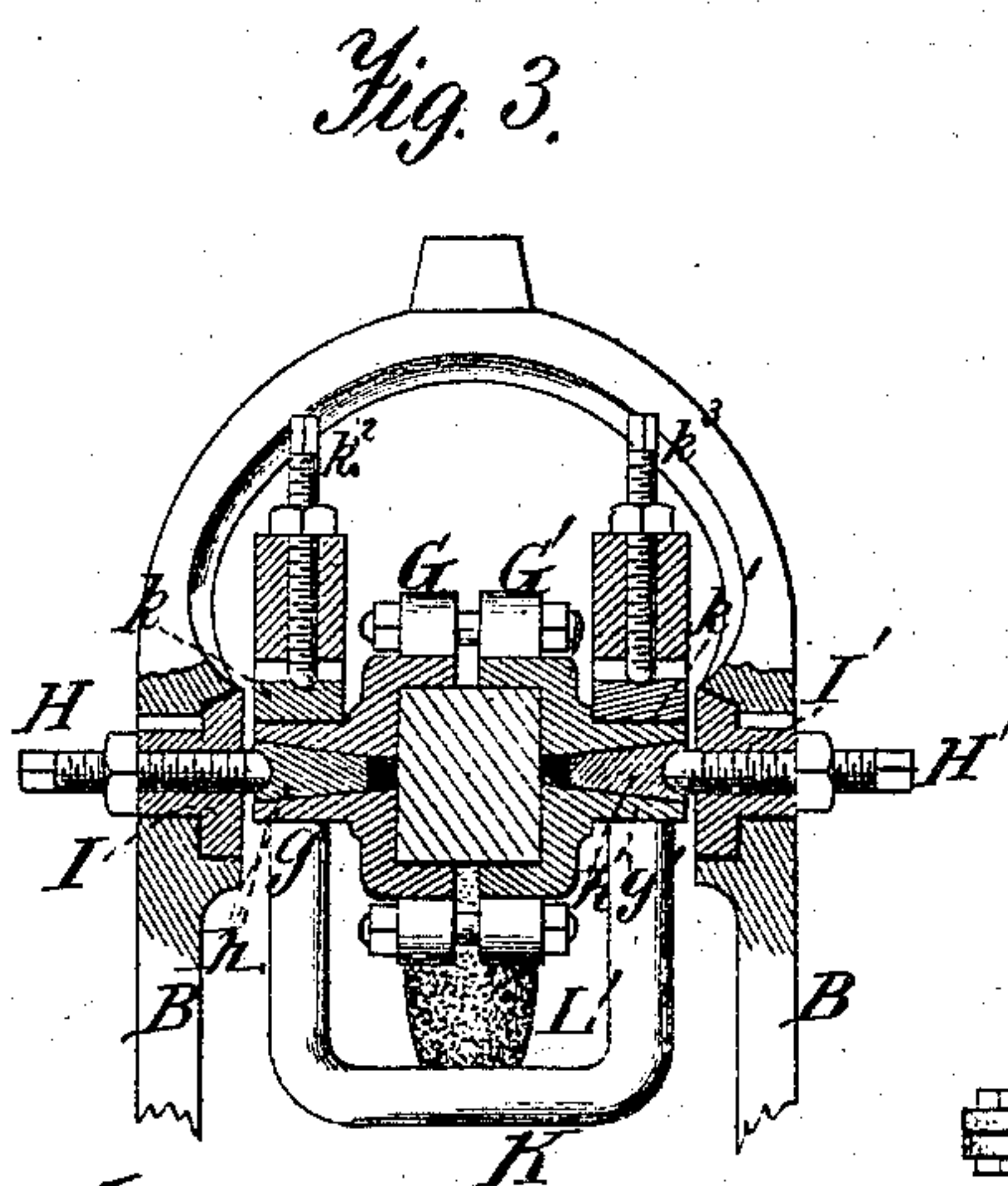
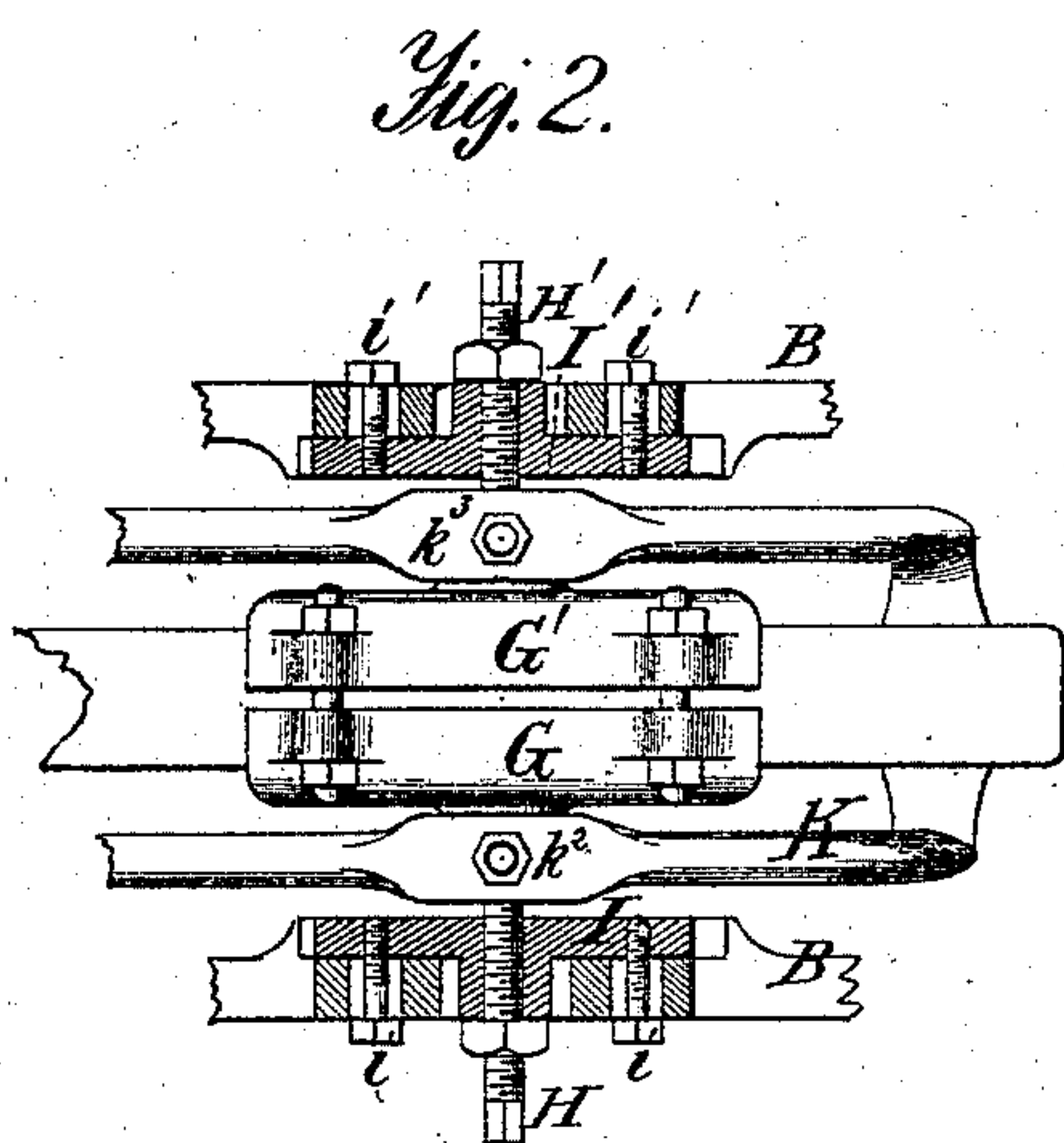
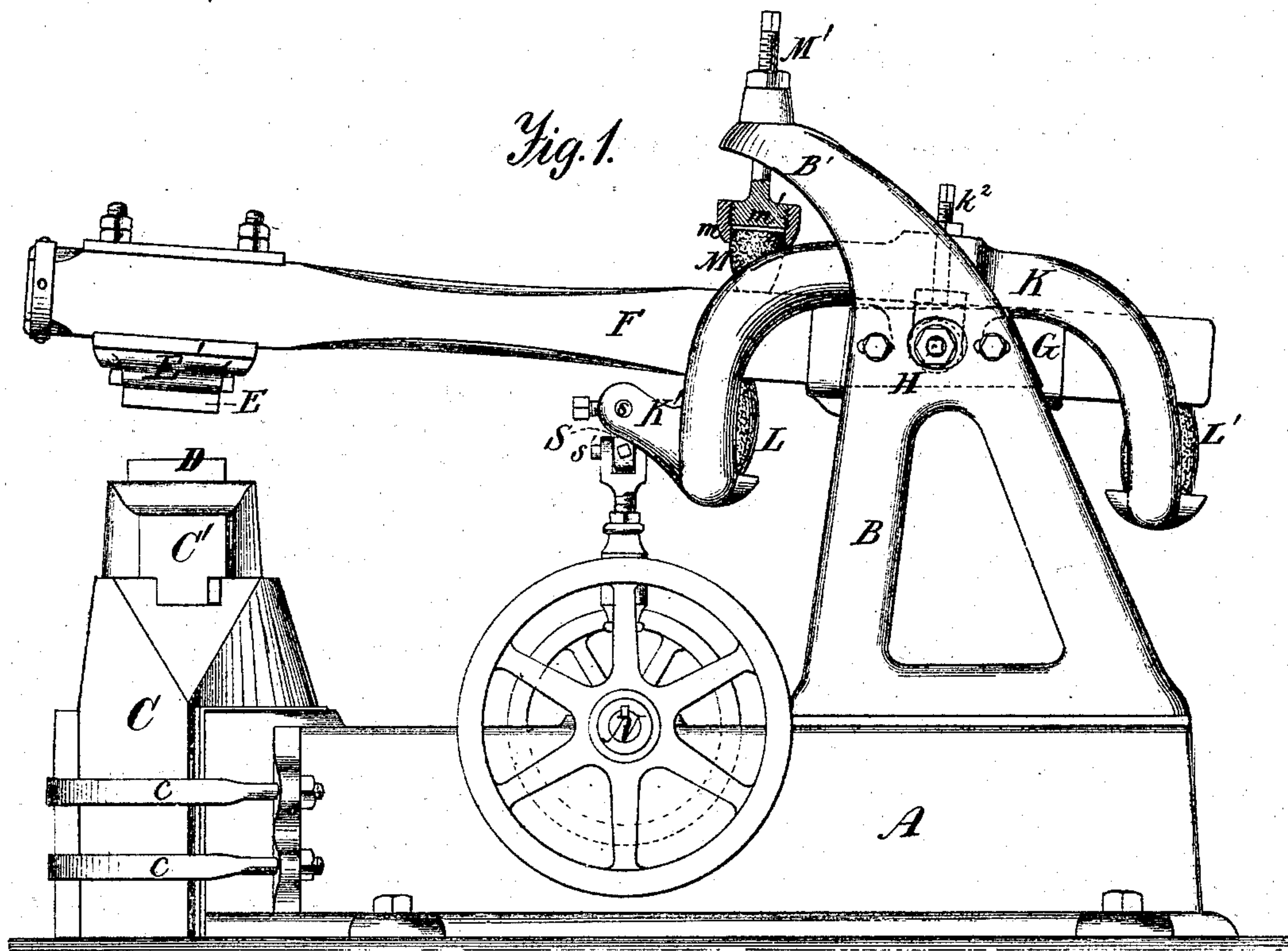
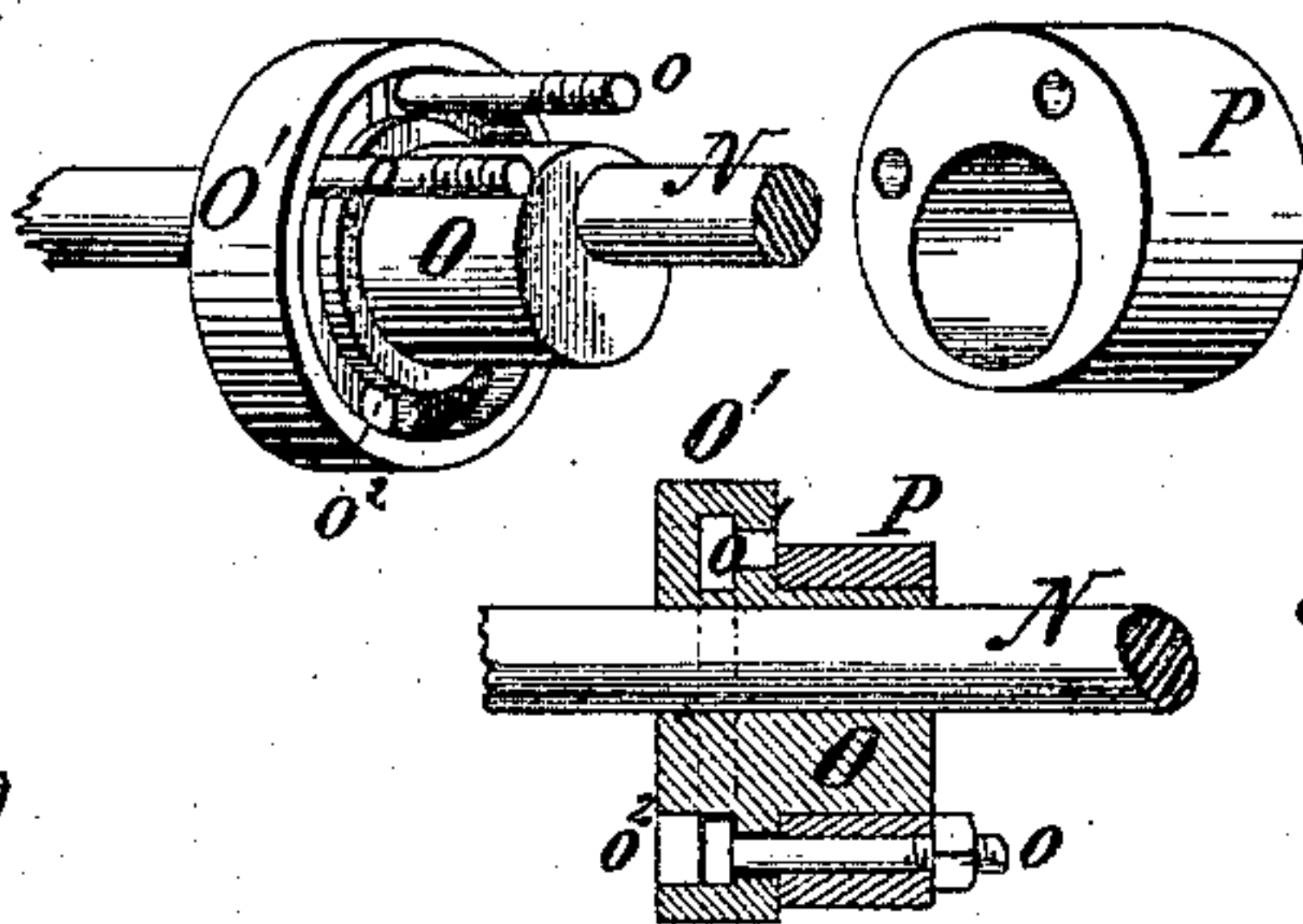


Fig. 5.



Witnesses.
A. Ruppert.
H. E. Quinn

John C. Butterfield
Inventor.
Fig. 6. pr. P. E. J. C. Eils
his Atty

UNITED STATES PATENT OFFICE.

JOHN C. BUTTERFIELD, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN POWER-HAMMERS.

Specification forming part of Letters Patent No. 144,059, dated October 28, 1873; application filed September 22, 1873.

To all whom it may concern:

Be it known that I, JOHN C. BUTTERFIELD, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Power-Hammers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

This invention relates to power-hammers, such as described in the reissued patent No. 4,470, granted jointly to myself and James Hay, July 18, A. D. 1871. My improvement consists, first, in the employment of a rubber buffer, suspended from the standards above the helve of the hammer and forward of its fulcrum, to aid the rear rubber spring underneath the short arm of the helve in arresting the upstroke of the hammer; secondly, in providing for the horizontal adjustment of the points of suspension of the helve of the hammer, so that it can readily be brought into proper alignment; thirdly, in suspending the helve, by means of a divided and laterally-applied cross-head, upon steel centers projecting through the standards of the frame; fourthly, in the peculiar construction of the eccentric operating the hammer, providing the means of adjusting its throw; and in the use of a universal joint as a connection between the eccentric rod and the oscillating beam or yoke of the helve, to prevent heating of the joint or connection when the oscillating beam is thrown out of alignment by uneven adjustment.

In the annexed drawings, Figure 1 is a side elevation of my improved power-hammer. Fig. 2 is a sectional plan, showing the means for adjusting the suspension-points of the helve. Fig. 3 is a vertical transverse section, showing the means for suspending the helve and adjusting the tension of the rubber springs or cushions. Fig. 4 is a front elevation of the eccentric and its rod. Fig. 5 shows in perspective the several parts of the eccentric detached. Fig. 6 is a longitudinal section of the eccentric.

The same letters of reference are used in all the figures in the designation of identical parts.

The standards B and anvil-block C are made separate from the bed A of the hammer, and interposed wood packings are employed to prevent concussion. The standards are securely bolted upon the rear end of the bed, and the anvil-block, fitted in a recess in its forward end, is bound to the same by suitable straps *c*, as clearly shown in Fig. 1. The top C' of the anvil-block is separate from the part C thereof, and is adjustable laterally, while the anvil D is adjustable longitudinally; thus the anvil can readily be brought into proper position with reference to the hammer E. The helve F of the hammer is provided with a metallic cross-head, composed of two parts, G and G', which are applied laterally, and firmly secured to the helve by bolts, as best seen in Figs. 2 and 3. Each half of the cross-head is provided with a journal, *g* and *g'*, respectively, and when the parts are properly secured the journals stand at right angles to the helve, and their axes are on a horizontal line intersecting the center of the helve. Male steel centers H and H', bearing against female steel centers *h* and *h'* in the ends of the journals of the cross-head, form the points on which the hammer-helve swings. The female centers are tapering in form, and are driven into tapering apertures in the journals; thus they can be readily secured, and as easily removed when worn out, to be replaced by others. The male centers are supported in slides I and I', seated in horizontal ways in the standards B. By separately adjusting these slides horizontally the hammer can be thrown either way laterally until it is brought into proper alignment, after which the slides are firmly secured by bolts *i* and *i'*, in the manner seen in Figs. 1 and 2. Motion is transmitted to the hammer through the yoke or beam K. The arched side bars of this yoke stand over the journals of the cross-head of the helve, while the connecting cross-bars at the ends are underneath the helve. A rubber spring or cushion, L, is placed upon the forward cross-bar of the yoke, and a similar spring, L', upon the rear cross-bar. The yoke is provided, in vertical ways in the center of its arched side bars, with brasses *k* and *k'*, which bear upon the upper sides of the journals of the cross-head of the helve, and are pressed upon by set-screws *k*² and *k*³. The springs L and L'

touch the under side of the helve, and may be compressed to any required degree by lifting the yoke through the medium of the set-screws k^2 and k^3 . The standards B are united on top by a forwardly-inclining arched bar, B', from which is suspended a rubber buffer, M, by means of a screw-threaded rod, M', the enlarged end m' of which screws into the cap m of the buffer. The buffer is so adjusted by the suspension-rod M' that it will be struck by the helve on its upstroke, and thus assist the spring L' in arresting the upward motion of the hammer. The degree of its assistance may be regulated by its vertical adjustment.

The hammer is operated through the medium of an eccentric on the driving-shaft N. The eccentric is of that kind in which means are provided for adjusting the throw, and may be termed a compound eccentric, as it consists of two eccentrics adjustable on each other. The eccentric O is keyed to the driving-shaft N, (see Figs. 4, 5, and 6,) and has formed upon one end a head, O', concentric with it. The eccentric P encircles the eccentric O, and is held thereon, in position to give the required throw, by bolts o , which project from an annular T-shaped groove, o^1 , in the head O'. The bolts are introduced through a hole, o^2 , so that their heads will bear against the annular shoulders formed by the enlarged part of the groove o^1 , as best seen in Fig. 6. To adjust the throw, it is only necessary to slightly loosen the nuts of the bolts o ; the eccentric P can then be turned, carrying the bolts along with it on the eccentric O; the adjustment is completed by again tightening the nuts. The shiftable eccentric P is encircled by the ordinary divided strap P', the upper half of which is attached to the eccentric rod, made, in this instance, in two parts, R and R', connected by a sleeve-nut, R², by adjusting which the length of rod can be changed as it becomes necessary. The eccentric rod is connected to projecting arms K' on the yoke K by means of a coupling, S, which is pivoted to said arms by a pin, s , standing at right angles to the pin s' , by which it is pivoted to the eccentric rod. A universal joint is thus formed as a connec-

tion between the yoke and the eccentric rod, so that a broad eccentric may be used without danger of injuring the several connections when the movement of the rod is not exactly at right angles to the axis of pin s . I prefer to make the pins s and s' tapering, so that lost motion in the joint may be readily taken up. The hammer E is adjustably secured to a plate, E', the upper side of which may be provided with A-shaped transverse projections to enter corresponding grooves cut in the helve, to which it is clamped by bolts, in the manner shown. The two parts of the cross-head are set into recesses formed in the sides of the helve to prevent endwise movement.

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

1. The combination of the yoke K, springs L and L', helve F, and buffer M, substantially as and for the purpose specified.

2. The combination of the slides I and I', horizontally adjustable on the standards B, and steel centers H and H', passed through the slides and applied to the cross-head of a power-hammer, substantially as specified.

3. The cross-head composed of two parts, G and G', and applied laterally to clasp the helve, when made in the form and working upon centers substantially as and for the purpose specified.

4. The eccentric and its rod, and the yoke K, in combination with the connecting universal joint, composed of the coupling S and pins s and s' , whether said pins be tapering or not, substantially as and for the purpose specified.

5. The compound eccentric composed of the fixed eccentric O, having a concentric head, O', with an annular T-shaped groove, o^1 , and eccentric P, adjustable on the fixed one, and held in position by bolts o , substantially as specified.

In testimony that I claim the foregoing I have hereunto set my hand this 12th day of September, 1873.

JOHN C. BUTTERFIELD.

Witnesses:

H. E. QUINN,

B. EDW. J. EILS.