

No. 607,510.

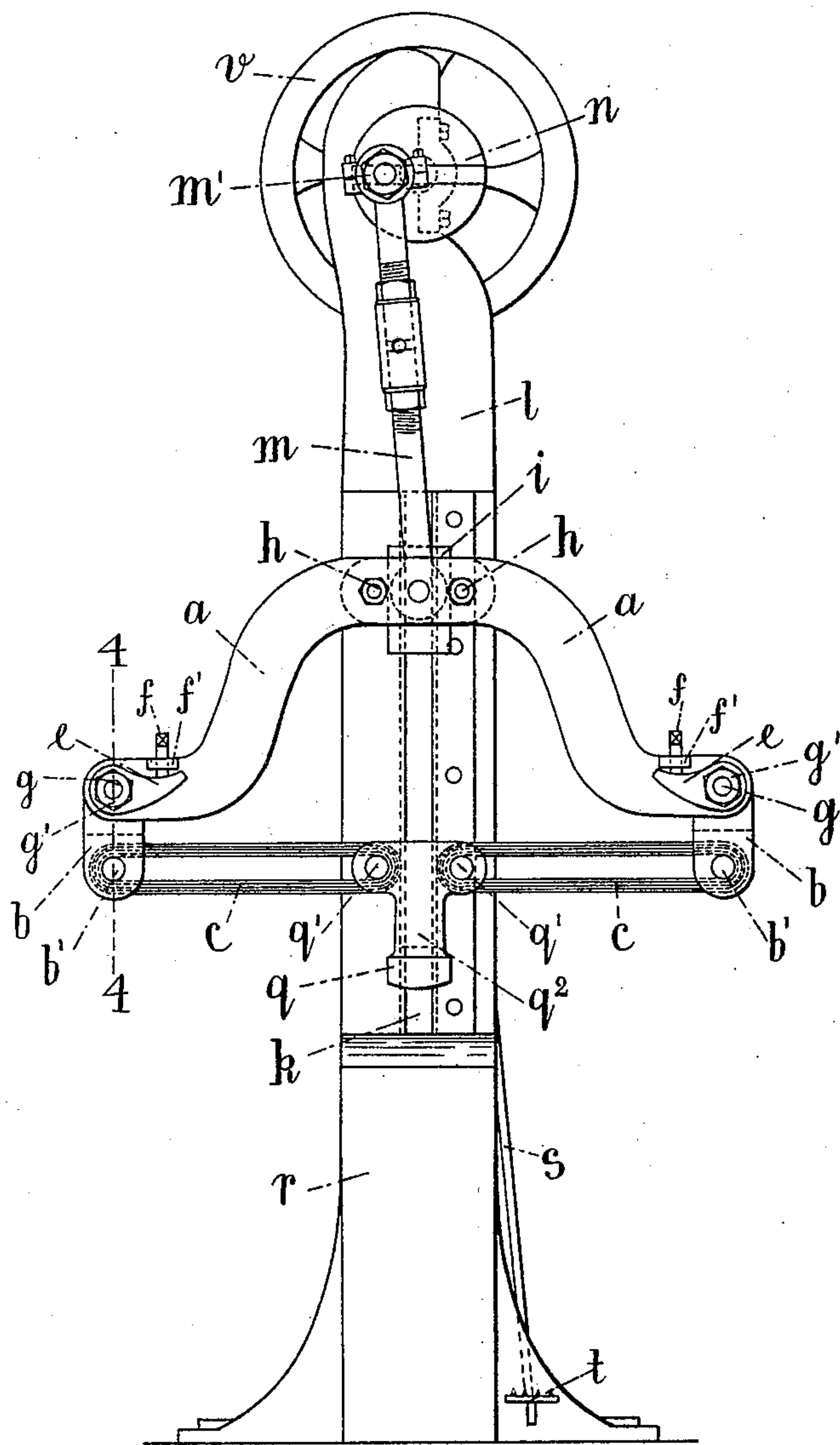
Patented July 19, 1898.

J. E. HERMANN.
METAL BEATER HAMMER.
(Application filed July 17, 1897.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.



Witnesses

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Harry Galhoun

Johann Ernst Hermann, Inventor

By Schreiter, Van Oderstine
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2 Sheets—Sheet 2.

Fig. 2.

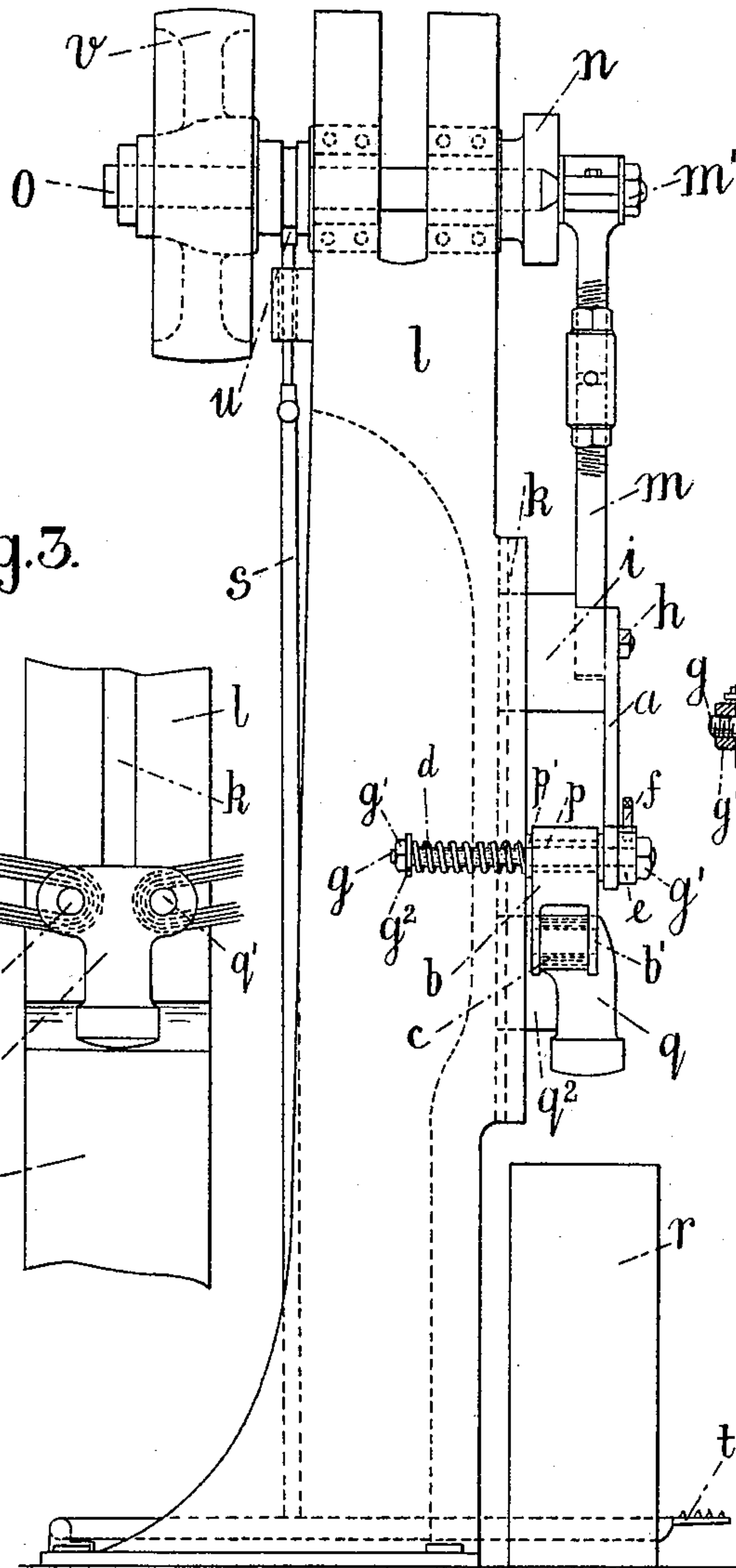


Fig. 3.

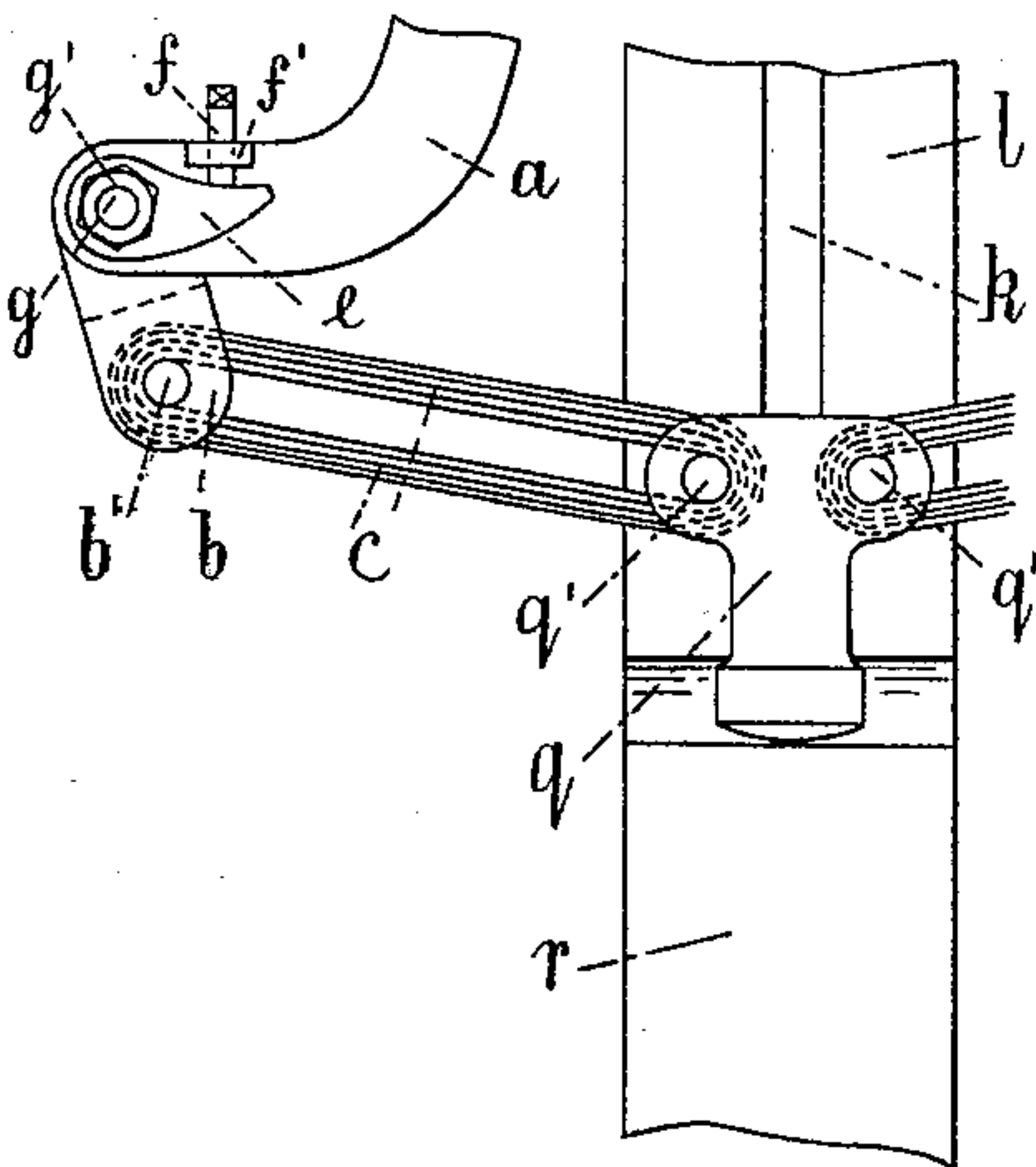
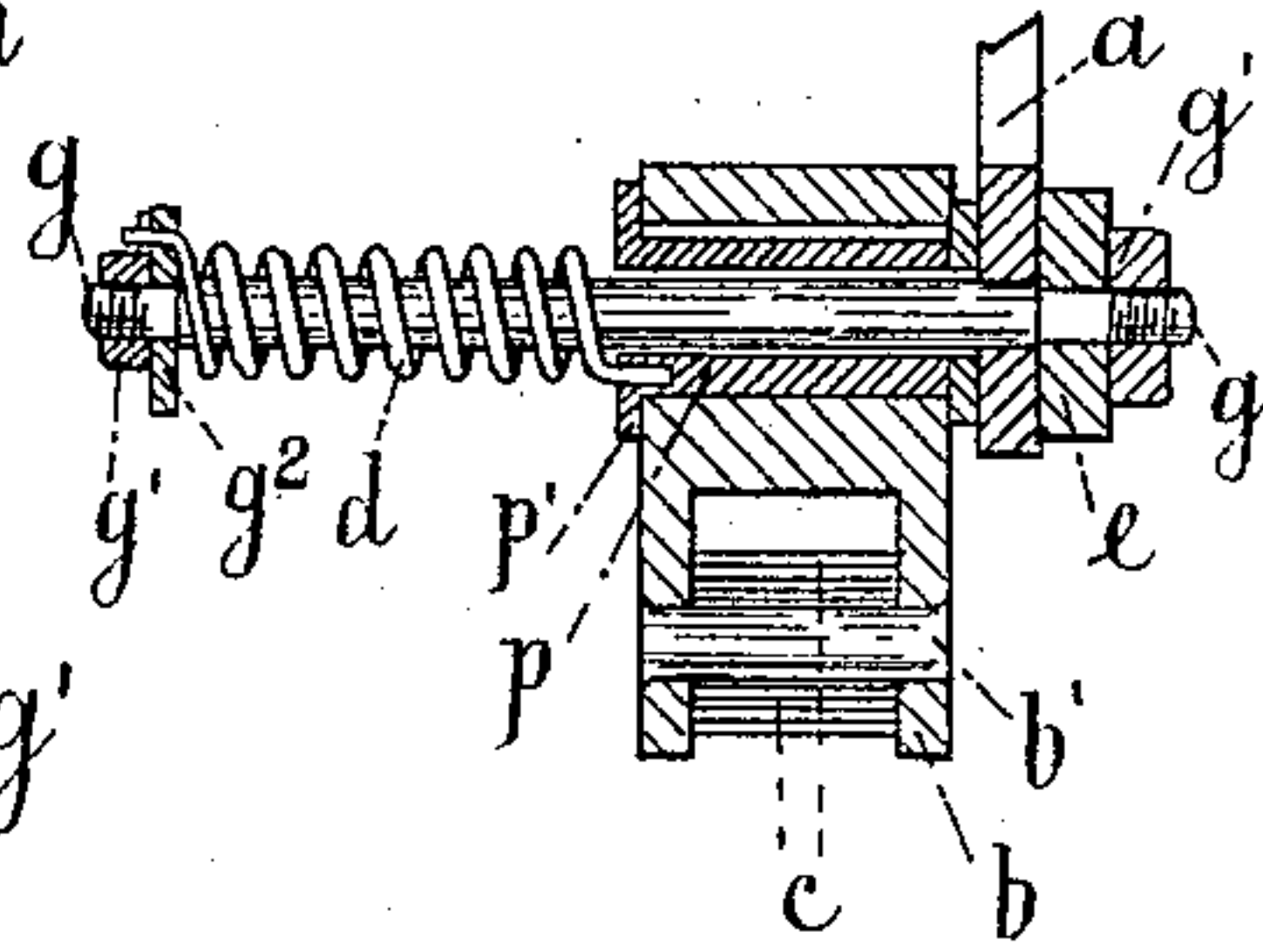


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHANN ERNST HERMANN, OF NEW YORK, N. Y., ASSIGNOR TO GREMPER
& HERMANN, OF SAME PLACE.

METAL-BEATER HAMMER.

SPECIFICATION forming part of Letters Patent No. 607,510, dated July 19, 1898.

Application filed July 17, 1897. Serial No. 644,927. (No model.)

To all whom it may concern:

Be it known that I, JOHANN ERNST HERMANN, a subject of the Emperor of Germany, and a resident of New York, (Brooklyn,) county of Kings, and State of New York, have invented certain new and useful Improvements in Metal-Beater Hammers, of which the following is a full, clear, and exact specification, reference being had to the accompanying drawings, wherein—

Figure 1 is a front view, and Fig. 2 a side elevation, of my improved hammer; Fig. 3, an enlarged detail showing the position of the operating parts in the moment of striking. Fig. 4 is also an enlarged detail, a sectional view on line 4 4, indicated in Fig. 1, showing the connection between the hammer and the bow.

Similar letters of reference indicate corresponding parts in all views of the drawings.

Beating of metallic leaf is yet mostly done by hand, though by using a power-hammer the cost of producing could be very materially reduced. The beating requires a strike that might be described by the word "springy," a strike that must be hard to have effect, and again not rigid to prevent beating of holes into the catches or shodders. This peculiar strike can only be produced by a skilled worker who has acquired this skill by long practice and experience. My invention tends to provide a power-hammer capable of producing this peculiar strike; and with this end in view my invention consists of the hereinafter-described construction of a hammer-frame and its combination with the hammer and with mechanism for imparting a motion thereto.

The frame consists of bow *a*, arms *b*, links *c*, studs *g*, springs *d*, setters *e*, and set-screws *f*, and is secured by bolts *h* to cross-head *i*, sliding in dovetail groove *k*, provided in standard *l*. Cross-head *i* is connected by rod *m*, pivoted on stud *m'*, to disk *n*, set on driving-shaft *o*, and guides the motion of the frame up and down. Hammer *q* is integral with block *q'*, sliding in groove *k*, and thus guiding its motion. In both ends of bow *a* are set studs *g*. They are secured by screw-nuts *g'*, holding also setters *e* in position. These latter and also collars *g''* are fixed to

the studs *g*, whereon are slid bushings *p* and springs *d*. The ends of springs *d* are secured in flanges *p'* of the bushings *p* and in collars *g''*. Springs *d* must have a wide clearance around the studs *g* and must not be closely wound, because friction would impair their action in the operation of the hammer. They must have the requisite tension to sustain hammer *q* in its normal position. (Shown in Fig. 1 of the drawings.) Setters *e* are fixed on the studs *g*, and therefore by turning these setters in the direction of the winding of these springs their coils will be compressed and their tension increased. Thus springs *d* may be set to operate hammers varying in weight and also adjusted to compensate for a moderate stretch of the flexible links *c*. This adjustment is effected by turning screws *f*, passing through the screw-threaded abutments *f'* and pressing against their ends.

Bushings *p* are mounted loosely on studs *g* and arms *b* are keyed thereto. They are bifurcated, and between the side bars thereof are set pins *b'*. Similar pins *q'* are set in lugs *q''* of the hammer *q*, and flexible links *c*, connecting hammer *q* with the bow *a*, are wound over these pins. They may consist either of belt, as shown in the drawings, or of a number of pivotally-joined metallic links, or they may be metallic springs or rubber bands of sufficient strength, the only requirement being that they be sufficiently flexible to readily yield to the motion of the hammer *q* and again to the reaction of the springs *d*, resisting to a certain degree or counterbalancing the force of its stroke.

Connecting-rod *m* is so adjusted that when the stud *m'* is in its lowest position hammer *q*, if held in its normal position relatively to the bow *a*, would be yet some distance from the upper surface of the package of material laid upon the anvil *r* to be beaten.

The hammer being moved up and down rapidly acquires a certain momentum that will carry it beyond the stroke of the frame. The force of this momentum of the hammer will draw arms *b* nearer together against the action of the springs *d*, and their resistance to the motion of the hammer will "soften," as it is termed, or make springy its strike. The strike of the hammer will thus have the

same effect upon the material as the strike of a hammer wielded by the hand of a skilful gold-beater. The material, though hit with the full force inherent to the hammer, will
5 not be beaten through, because the resistance of springs d , increasing in equal ratio as the hammer descends, will finally overbalance its momentum, and thus limit its action to a certain predetermined extent.

10 The action of the springs d in withdrawing the hammer from the metal beaten is augmented by the action of the operating mechanism, drawing the frame a upward again before the hammer reaches the lowest point of
15 its stroke. When the force of the downward stroke of the hammer is expended, the reaction of the springs a will tend to lift the hammer into its normal position and thereby again increase its velocity and momentum. The
20 combined action of the springs and of the mechanism lifting the frame will extend the upward motion of the hammer, and the subsequent reaction of the springs will again increase the effect of its downward stroke. Thus
25 the force of the strike will gradually grow as the operation progresses. This is another important advantage of my improved construction. By such growing increase of the force of the strike the manual action of a skilled
30 gold-beater is yet more closely imitated and the beating being much faster and more forcible the product of this mechanical process will excel the output of skilled manual labor both qualitatively and quantitatively.

35 The operation of the hammer is started and

stopped by treadle t , connected by rod s to the mechanism operating clutch u , clutching pulley v to shaft o . This treadle is operated by foot and gives the operator of the hammer the advantage of being able to use both hands
40 for manipulating the package upon the anvil.

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

1. A harness for a power-hammer, comprising a cross-head, a bow secured to the cross-head, arms pivoted to the ends of the bow, flexible links connecting the hammer to the arms, tension-springs set on the pivots and acting upon the arms, and means for adjusting the tension on the springs.
45 50

2. The combination with the driving mechanism of a power-hammer, of a cross-head mounted in guideways, secured to the standard and pivotally connected to the connecting-rod; a harness comprising a bow, rigidly
55 secured to the cross-head, arms pivoted to the ends of the bow, springs set on the pivots and drawing the arms apart, a hammer integral with a cross-head sliding in guideways secured to the standard and of means for flexi-
60 bly connecting the hammer to the arms.

In witness that I claim the improvements described in the foregoing specification I have signed my name in the presence of two subscribing witnesses.

JOHANN ERNST HERMANN.

Witnesses:

FRANCIS W. GREMPER,
HENRY SCHREITER.