No. 712,934. Patented Nov. 4, 1902.

A. W. JOHNSON.

DEVICE FOR OPERATING CONCENTRATING TABLES.

(Application filed June 12, 1902.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

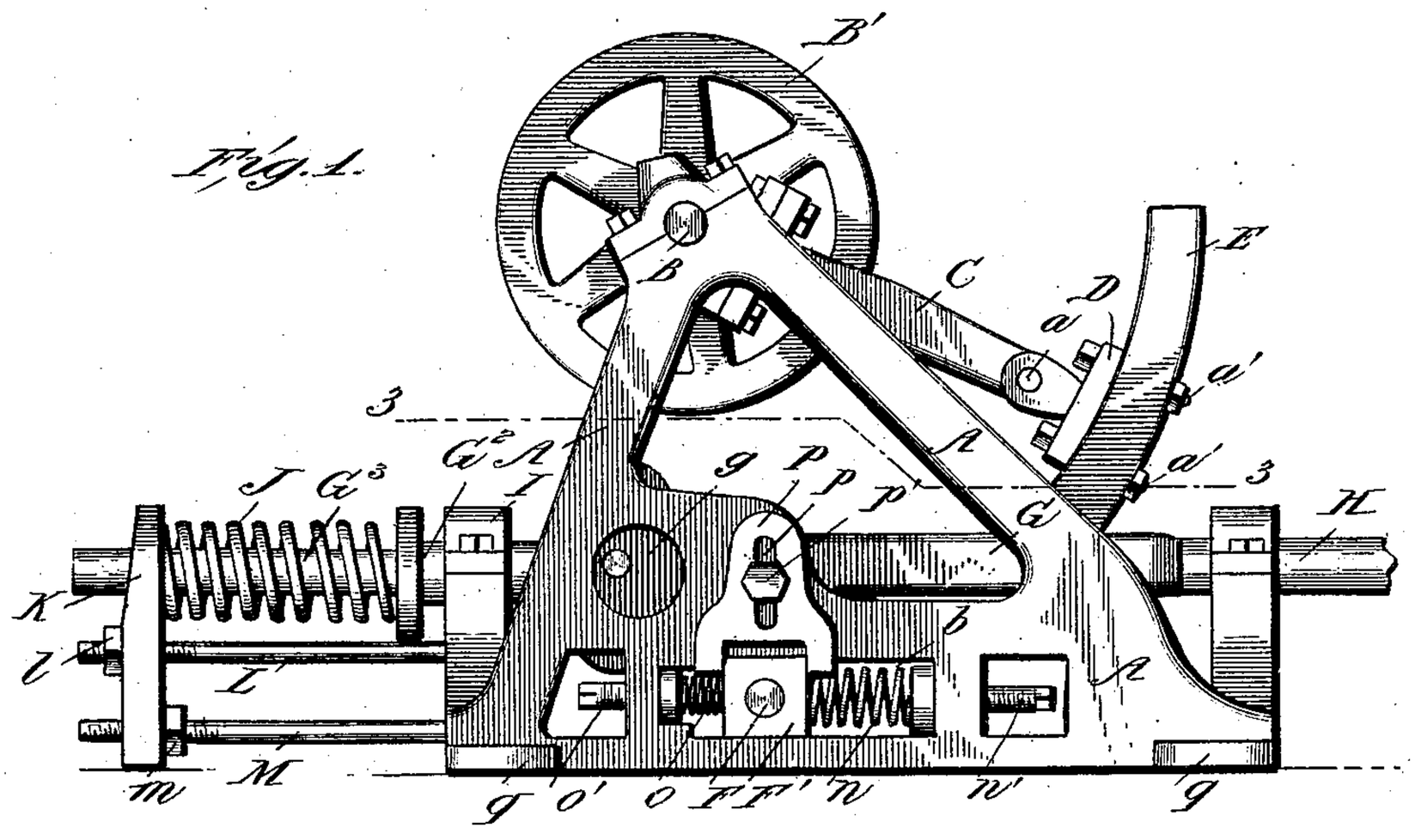
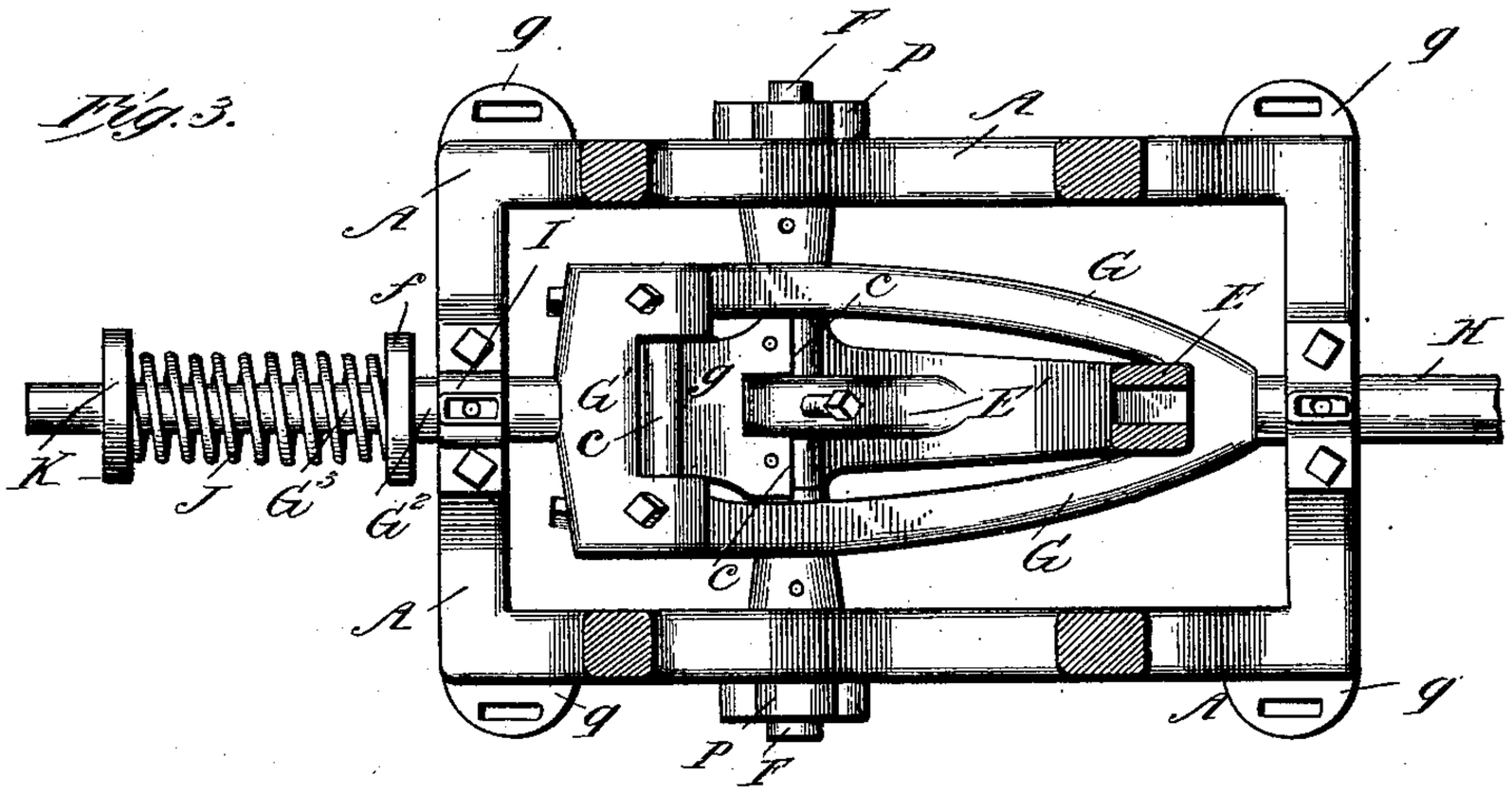


Fig. 3.



WITNESSES:

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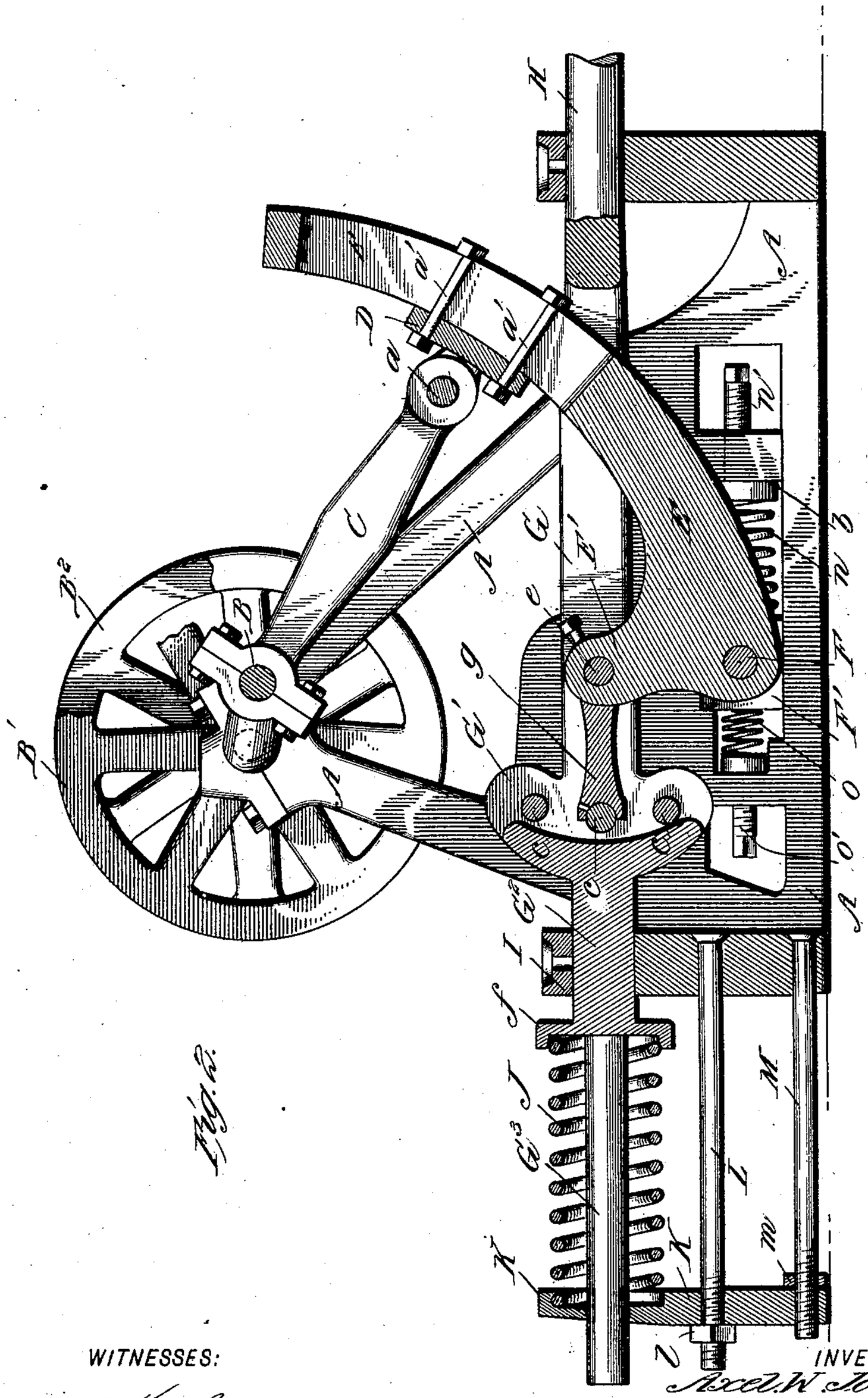

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UNITED STATES PATENT OFFICE.

AXEL WILHELM JOHNSON, OF ASPEN, COLORADO.

DEVICE FOR OPERATING CONCENTRATING-TABLES.

SPECIFICATION forming part of Letters Patent No. 712,934, dated November 4, 1902.

Application filed June 12, 1902. Serial No. 111,275. (No model.)

To all whom it may concern:

Be it known that I, AXEL WILHELM JOHNSON, of Aspen, in the county of Pitkin and State of Colorado, have invented a new and useful Improvement in Devices for Operating Concentrating-Tables, of which the following is a specification.

My invention is in the nature of a mechanical appliance for imparting to the reciprocating tables of ore-concentrators and like machines their necessary shaking movement; and it consists in the novel construction and arrangement of the various parts of the device whereby five or more modified movements may be imparted to the shaking table with a very simple and compact construction and one that requires but little power to operate it, as will be hereinafter fully described with reference to the drawings, in which—

Figure 1 is a side elevation. Fig. 2 is an enlarged vertical longitudinal section, and Fig. 3 is a horizontal section on line 3 3 of Fig. 1.

In the drawings, A represents the main frame.

B is the main crank-shaft, journaled in bearings in the top of the main frame and having its middle portion cranked and bearing on its ends a tight and a loose pulley B′ B^2. The main shaft B has its crank portion connected to a connecting-rod C, and this in turn is jointed at *a* to a sliding block D, whose outer face is curved to fit a curved slotted arm E and is adjustably connected thereto by bolts *a′*, which pass through the slot in said arm. By means of these bolts the sliding block may be clamped to said arm at any desired position along its length. The arm E at its lower end is fulcrumed on a cross-shaft F, held in boxes F′ F′, which are adjustable in horizontal slots *b* in the lower part of the framework. The curved arm E has formed on it just above its fulcrum a projection E′, bearing a cross-pin *e*, and this cross-pin rocks in and bears against a thrust-block *g*, adapted to press against any one of the three bearings *c* of a reciprocating yoke G. This yoke surrounds the curved arm E and the thrust-bar *g* and at one end connects with a rod H, that is fastened to the shaking table of the concentrator, (not shown,) and at the other end has an enlarged head G′, made in one piece with a stem G^2 G^3. The portion G^2 of the stem is made larger than G^3, and this larger portion slides in a box I on the end of the main frame and outside this box has a cup *f*, that bears against a helical spring J, coiled around the smaller portion G^3. The outer end of the smaller stem portion passes through a hole in a vertical abutment-bar K, and the spring also bears against the upper end of said bar, so that when the stems G^2 G^3 and the yoke G and shaker-rod H are moved to the left in Fig. 2 the spring will be compressed, and when the pressure on the said parts is released the spring will send them back again. The abutment-bar is held in position by two parallel rods L and M, projecting from the end of the framework. The upper one of these rods L has a nut *l* screwed on its end outside the abutment-bar, and the lower rod M has a nut *m* screwed on the same on the inside of the abutment-bar. By adjusting these nuts the degree of compression of the spring may be regulated at will.

The boxes F′ F′ of the fulcrum-shaft F are held in the slots *b* by springs *n* and *o* on opposite sides of the same, of which springs *n* is larger than *o*, and each is held under an adjustable compression by its own set-screw *n′* or *o′*. These boxes are fixedly held in position by adjustable keepers P, which are in the nature of plates notched at their lower edges to receive and hold the squared ends of the boxes, and said keepers have each a vertical slot *p* to receive a bolt or lag-screw *p′*, which secures the keeper fixedly to the side of the framework.

The whole apparatus is provided at the lower edges of the framework with slotted lugs *q* at its corners by which it may be firmly bolted to any suitable foundation.

The operation of my device is as follows: When the crank-shaft is rotated by power imparted from a belt to the pulley, the connecting-rod rocks the curved arm E about its fulcrum-shaft F, and the projection E′ of the arm, acting through its pin *e*, thrust-block *g*, seat *c*, and the yoke G, imparts a reciprocating motion to the latter, and consequently to the shaker-rod H, which connects with the concentrator-table, the motion in one direction being aided by the action of the spring J. By adjusting the sliding block of the con-

necting-rod higher or lower on the curved arm a variable leverage and power may be obtained and a variable throw for the shaker-rod.

The object in making the fulcrum-shaft and its boxes spring-seated on opposite sides and locking them by means of the notched keeper-plate P is as follows: When the keepers P are locked upon the journal-boxes F′, the fulcrum-shaft F is held immovably; but when the keepers P are raised the fulcrum-shaft F has a motion under the working strain by reason of the two springs *n* and *o*. Thus when arm E moves upward and to the left the shaft F compresses spring *n* and the thrust-block *g* compresses spring J, but does not give the full throw to the yoke G, owing to the fact that the fulcrum-shaft F has a back-lash movement against spring *n*. The spring *o* is only to prevent the journal-bearing F′ from moving too far to the left and to modify also the action of spring *n*.

By adjusting the thrust-block *g* to any one of the three bearings *c* different movements of the yoke G and bar H are obtained.

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

1. A device for converting rotary motion into reciprocating motion, comprising a crank-shaft, a connecting-rod, a sliding block jointed to the connecting-rod, a curved arm with means for adjustably clamping the sliding block thereto, said curved arm having a fulcrum at its lower end with an abutting projection above its fulcrum, a thrust-block *g* jointed thereto, and a yoke inclosing the curved arm and carrying a seat with the three bearings *c c c* either of which is adapted to be operated upon by the thrust-block substantially as shown and described.

2. A device for converting rotary motion into reciprocating motion, comprising a crank-shaft, a connecting-rod, a sliding block jointed to the connecting-rod, a curved arm with means for adjustably clamping the sliding block thereto, said curved arm having a fulcrum at its lower end with an abutting projection above its fulcrum, a thrust-block *g* jointed thereto, a yoke embracing the curved arm and carrying a seat with three bearings *c c c* either of which is adapted to be operated upon by the thrust-block, said yoke having a shaker-rod attached to one end and having at its other end a stem bearing a compression-spring substantially as shown and described.

3. A device for converting rotary motion into reciprocating motion, comprising a crank-shaft, a connecting-rod, a sliding block jointed to the connecting-rod, a curved arm with means for adjustably clamping the sliding block thereto, a fulcrum for said curved arm arranged at its lower end and made horizontally adjustable, springs for cushioning said fulcrum, a yoke embracing the curved arm having a seat with three bearings and a thrust-block for connecting the curved arm and yoke substantially as shown and described.

4. A device for converting rotary motion into reciprocating motion, comprising a crank-shaft, a connecting-rod, a rocking arm connected thereto, a yoke embracing the rocking arm and connected to it for reciprocation, a shaft forming a fulcrum for the lower end of the arm, adjustable boxes carrying the ends of the shaft, and springs arranged on opposite sides of the boxes and means for holding the boxes in their positions substantially as shown and described.

5. A device for converting rotary motion into reciprocating motion, comprising a crank-shaft, a connecting-rod, a rocking arm connected thereto and fulcrumed at its lower end and having a projection above its fulcrum, a yoke made in one piece and embracing the rocking arm and having a seat with three bearings, and a thrust-block for connecting any one of said bearings to the projection of the rocking arm, one end of said yoke being extended in the form of a stem and bearing a compression-spring, a vertical abutment-bar for the spring receiving and guiding said stem, and two parallel anchorage rods for the abutment-bar connected to it substantially as shown and described.

6. A device for converting rotary motion into reciprocating motion, comprising a crank-shaft, a connecting-rod, a rocking arm connected thereto, a yoke embracing the rocking arm and connected to it for reciprocation, a shaft forming a fulcrum for the lower end of the arm, adjustable boxes carrying the ends of the shaft, springs arranged on opposite sides of the boxes and keeper-plates arranged to lock the boxes rigidly in place substantially as shown and described.

AXEL WILHELM JOHNSON.

Witnesses:
NELS MAYNIE,
CHARLES JOHNSON.