No. 658,478. Patented Sept. 25, 1900.

H. D. WILLIAMS & H. G. HOADLEY.

MECHANICAL MOVEMENT.

(Application filed Feb. 15, 1897. Renewed Mar. 6, 1900.)

(Model.)

Fig. 1

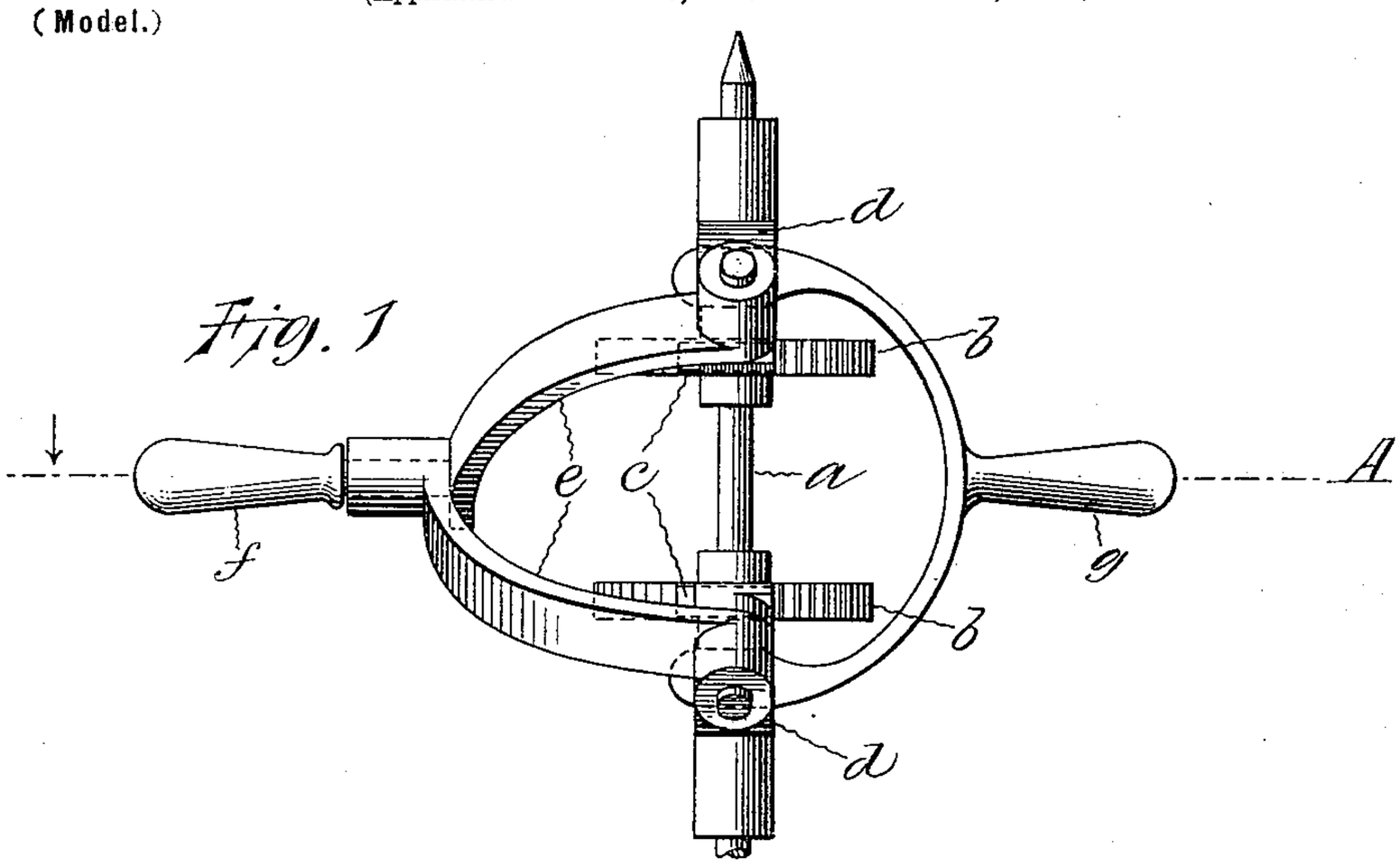


Fig. 2

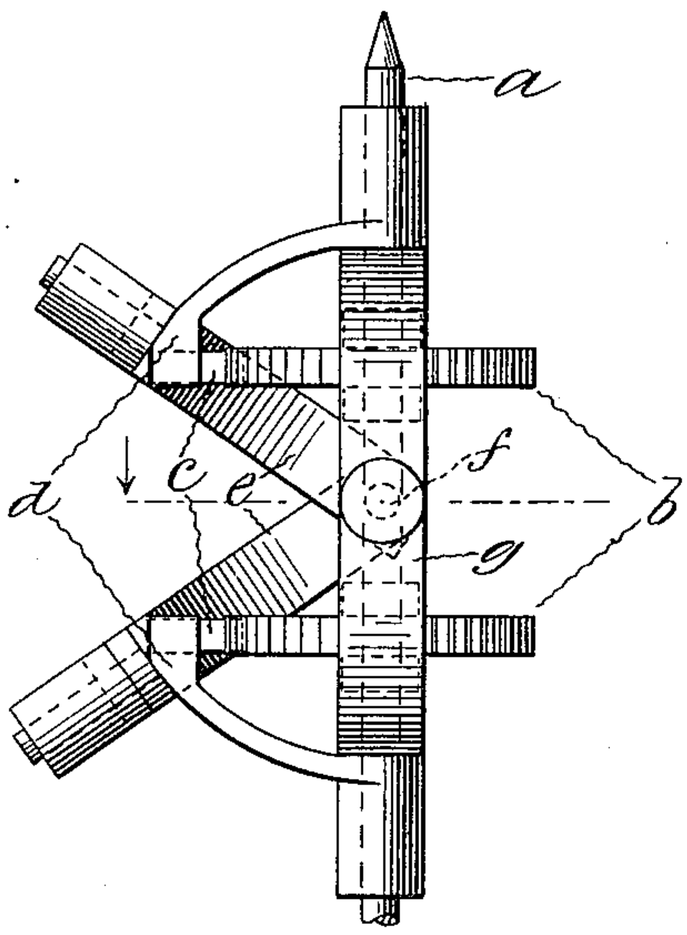
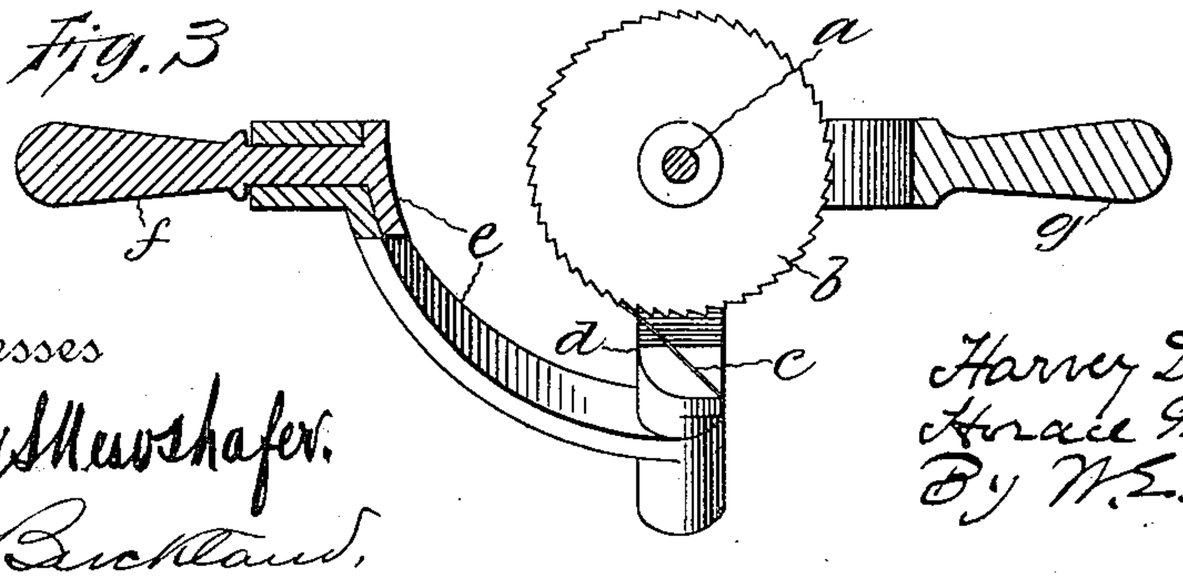


Fig. 3



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MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 658,478, dated September 25, 1900.

Application filed February 15, 1897. Renewed March 6, 1900. Serial No. 7,593. (Model.)

To all whom it may concern:

Be it known that we, HARVEY D. WILLIAMS, residing at Ithaca, in the county of Tompkins and State of New York, and HORACE G. HOADLEY, residing at Waterbury, in the county of New Haven and State of Connecticut, citizens of the United States of America, have invented a certain new and useful Improvement in Mechanical Movements, of which the following is a description, reference being had to the accompanying drawings, wherein—

Figure 1 is what may be called an "elevation" view when the main rotary shaft is held in a vertical position. Fig. 2 is another elevation view from the point A. Fig. 3 is a sectional detail.

The object of the improvement is, in general terms, to produce the rotary movement of a shaft by means of the vibratory movement of a lever vibrated in a plane embracing the axis of said shaft as well as otherwise.

In the accompanying drawings, the letter *a* denotes the rotary shaft. The letter *b* denotes two ratch-wheels fixedly attached to said shaft. The mechanism is operative if only one ratch-wheel is used, but its efficiency is practically doubled by the use of two.

The letter *c* denotes two oscillatory pawls each coöperating in action with one of the ratch-wheels.

The letter *d* denotes two supports, one for each of the pawls, journaled on said shaft and each carrying its pawl *c*.

The letter *e* denotes two similar curved yokes, each of which is pivotally attached to one of the pawl-supports. Both are brought to a common pivotal attachment and there the operating-lever *f* is attached.

The letter *g* denotes a frame or handle for supporting and holding the rotary shaft journaled on the latter.

By vibrating the lever *f* back and forth in any plane embracing the axis of the shaft or any path, curved or straight, approximating to such a plane the pawls alternately give the ratch-wheels, and consequently the main shaft, a step-by-step rotary motion.

One purpose to which this improvement is readily applicable is the operation of a hand-drill.

The foregoing specification has mentioned and described ratch-wheels and coöperating pawls. Any frictional device which can be substituted for the ratch and pawl is the mechanical equivalent thereof.

We claim as our improvement—

1. In combination, the rotary shaft, a ratchet-wheel fixed upon said shaft, a curved support journaled upon said shaft and carrying an oscillatory pawl coöperating with said ratchet-wheel, a second curved support, and curved yokes pivoted respectively to said pawl-supports and joined by a common pivotal attachment, whereby the movement of said common pivotal attachment in any path approximating to an axial plane of said shaft causes the oscillation of said pawl and the intermittent rotation of said shaft, substantially as shown and described.

2. In combination, the rotary shaft, the two ratch-wheels fixed on said shaft, the two oscillatory pawls, the two supports for said pawls journaled on said shaft, and the two connecting-rods each pivotally attached to one of said supports and brought to a common pivotal attachment to each other, all substantially as described and for the purposes set forth.

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