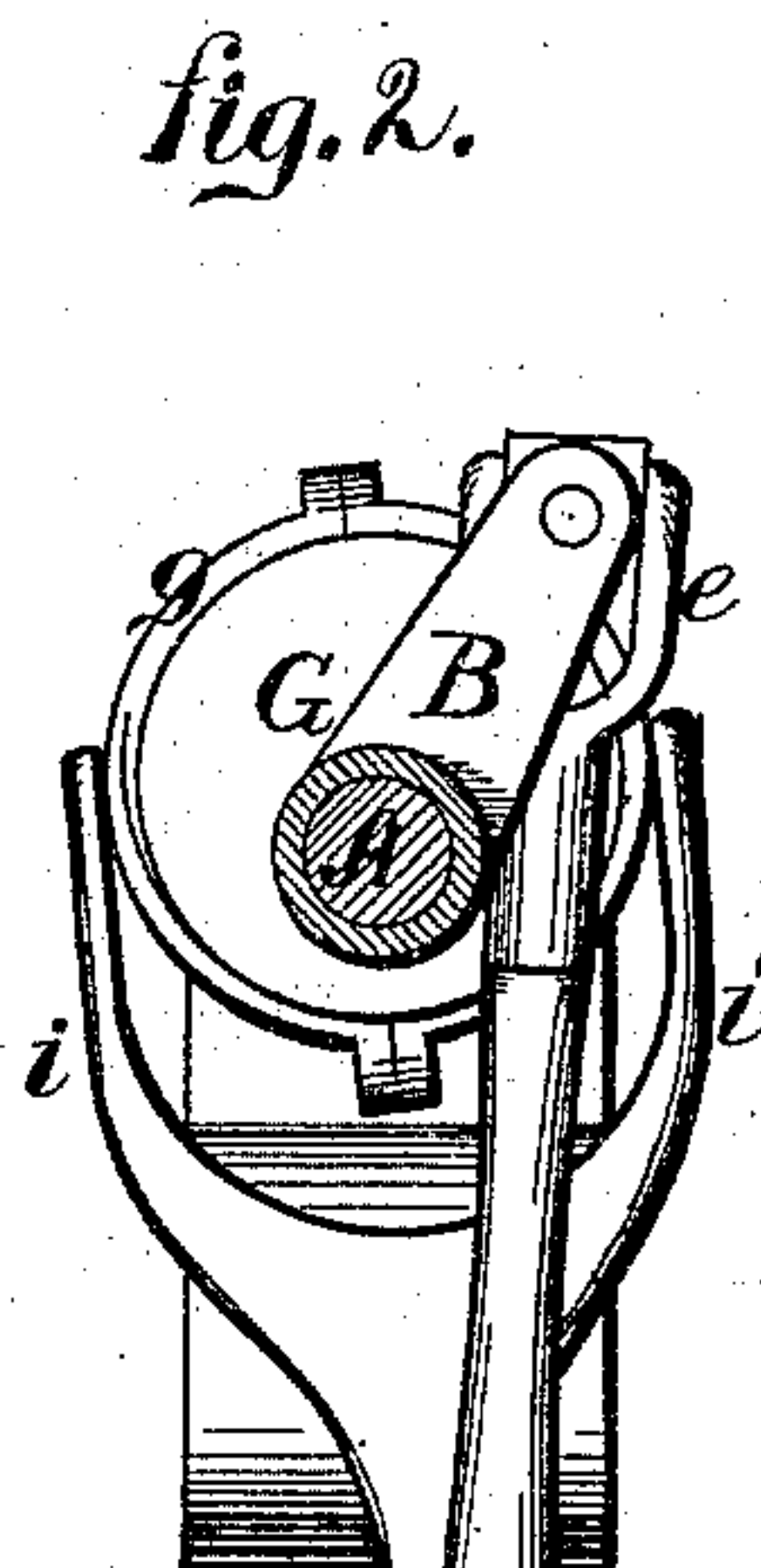
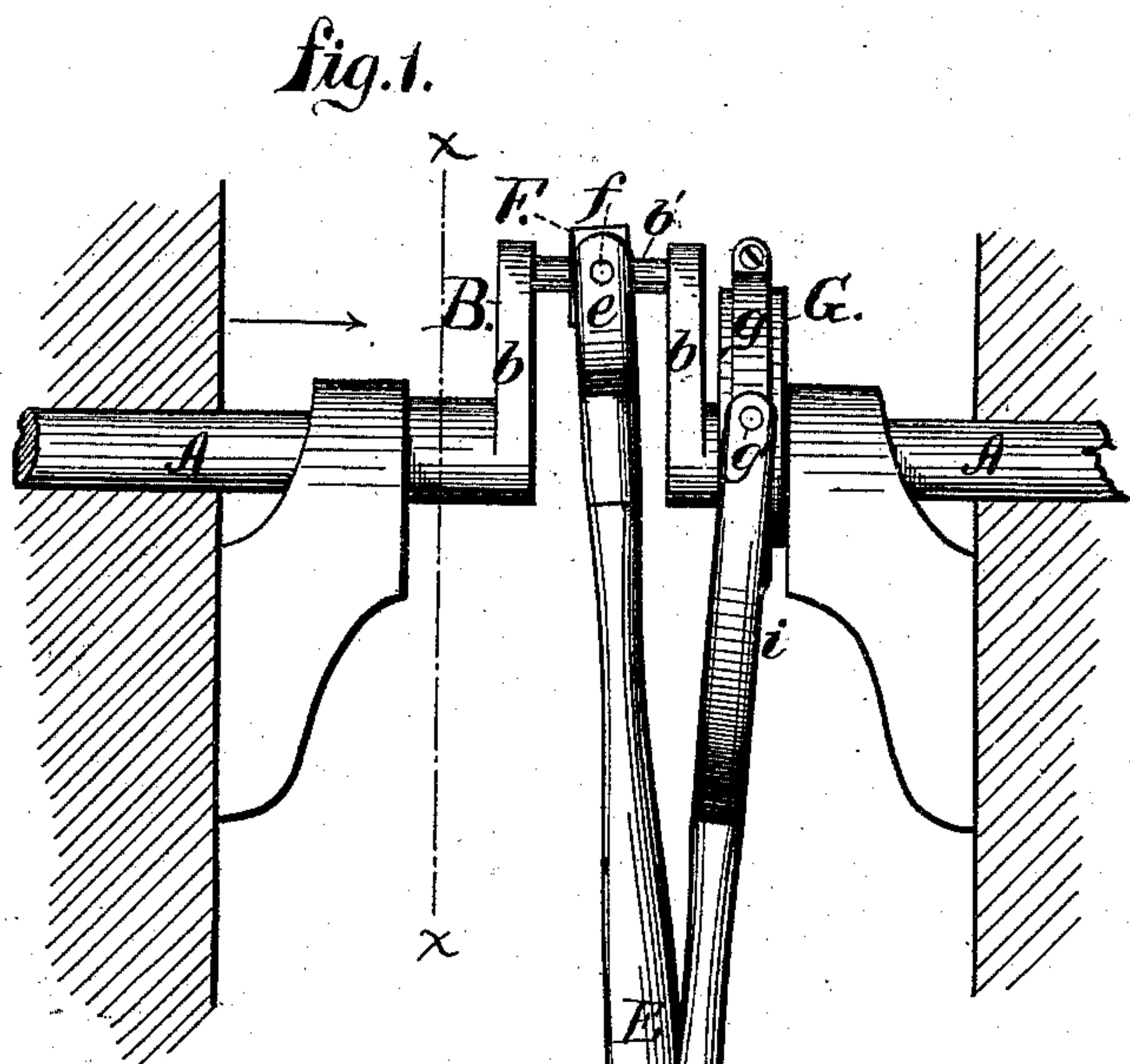


(No Model.)

J. E. UNDERWOOD.
Mechanical Movement.

No. 229,295.

Patented June 29, 1880.



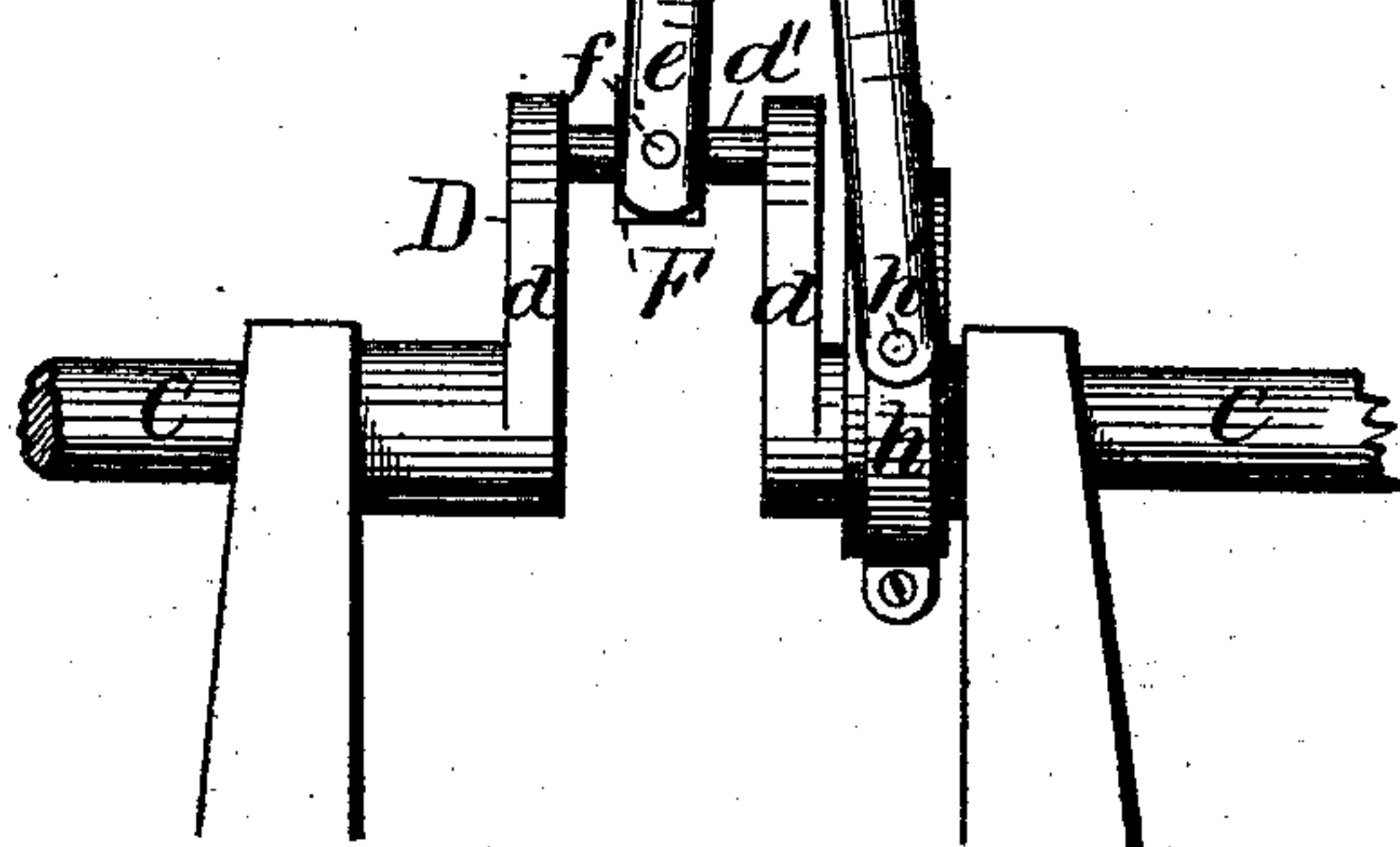
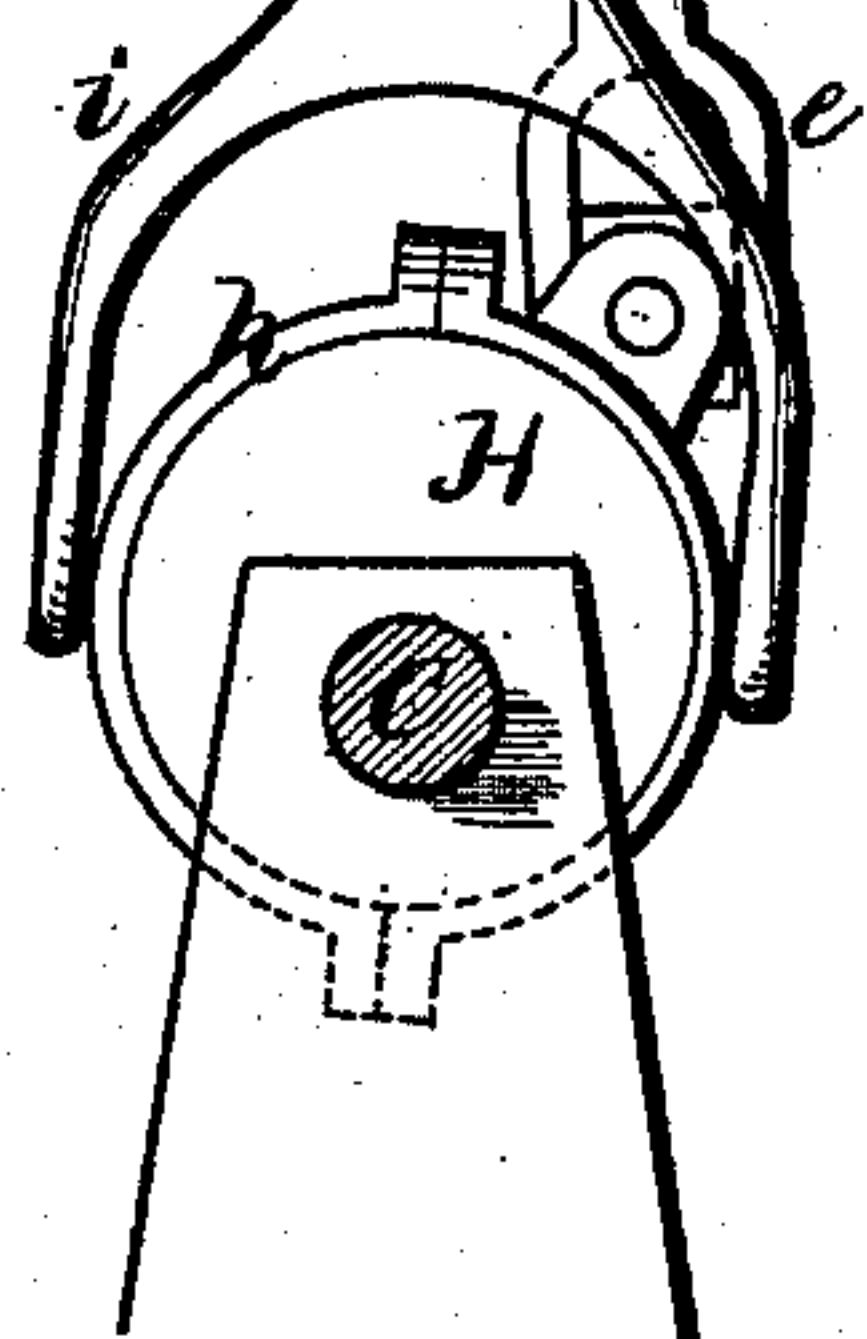
Witnesses:

Robt F. Gaylord,
Chas E. Perkins

Inventor:

J. E. Underwood

By W. E. Simmonds
Atty



UNITED STATES PATENT OFFICE.

JAMES E. UNDERWOOD, OF TOLLAND, CONNECTICUT.

MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 229,295, dated June 29, 1880.

Application filed April 17, 1880. (No model.)

To all whom it may concern :

Be it known that I, JAMES E. UNDERWOOD, of Tolland, in the county of Tolland and State of Connecticut, have invented a certain new and useful Improvement in a Mechanical Movement for Transmitting Rotary Motion, of which the following is a description, reference being had to accompanying drawings, where—

Figure 1 is what may be termed a front view of the device. Fig. 2 is a side view; it cuts the driving-shaft in section on the plane *x x*, Fig. 1.

The purposes of the invention are, first, the transmission of rotary motion from one shaft to another by means of cranks on each united by a connecting-rod, and at the same time obviating dead-centers; second, the transmission of rotary motion from one shaft to another shaft set at an angle to the former by means of cranks and a connecting-rod; third, the transmission of rotary motion from one shaft to another shaft set at an angle to the former, by means of cranks and a connecting-rod, and at the same time obviating dead-centers.

The letter A denotes the shaft from which power is communicated, which I term the "driving-shaft," and B denotes the crank thereof as a whole, made up of the crank-arms *b* and crank-pin *b'*. The letter C denotes the shaft to which power and motion are communicated, which I term the "driven shaft," in the present instance set at right angles to the driving-shaft. The letter D denotes the crank of the driven shaft, made up of the crank-arms *d* and the crank-pin *d'*.

The letter E denotes the connecting-rod attached to both cranks by a universal joint. The ends are bifurcated into forks *e*, which are pivoted on the trunnions *f* appurtenant to the boxes F, which inclose and are hung upon the crank-pins. These universal joints permit the driven shaft to be set at an angle to the driving-shaft.

The letter G denotes an eccentric disk rigidly fixed upon the driving-shaft. *g* denotes the strap thereof. The letter H denotes a corresponding eccentric on the driven shaft, and *h* denotes the strap thereof. The strap *g* is provided with trunnions *g'*, and the strap *h* with corresponding trunnions *h'*.

The letter I denotes a rod, bifurcated at each end into forks *i*, which are—each set of bifurcations respectively—pivoted on the trunnions *g'* and *h'*, and the eccentrics are so set upon their respective shafts that when the cranks are on dead-centers the eccentrics are not, and will thereby keep up the transmission of power and motion.

When the two shafts are not set at an angle to each other the connecting-rod I does not need to be pivoted to the straps, but may be rigid therewith; neither, in such case, does the connecting-rod E need to be pivotally connected to the boxes F.

I claim as my invention—

1. In combination, the driving-shaft, with its crank, the driven shaft, set at an angle to the driving-shaft, with its crank, and the connecting-rod between the cranks, attached to both by a universal joint, all substantially as described, and for the purposes set forth.

2. In combination, the driving-shaft, with its crank and eccentric, the driven shaft, set at an angle to the driving-shaft, with its crank and eccentric, the connecting-rod attached to both cranks by a universal joint, and the connecting-rod pivotally attached to the eccentric straps, all substantially as described, and for the purposes set forth.

JAMES E. UNDERWOOD.

Witnesses:

CHARLES A. HAWKINS,
G. FRANK UHLER.