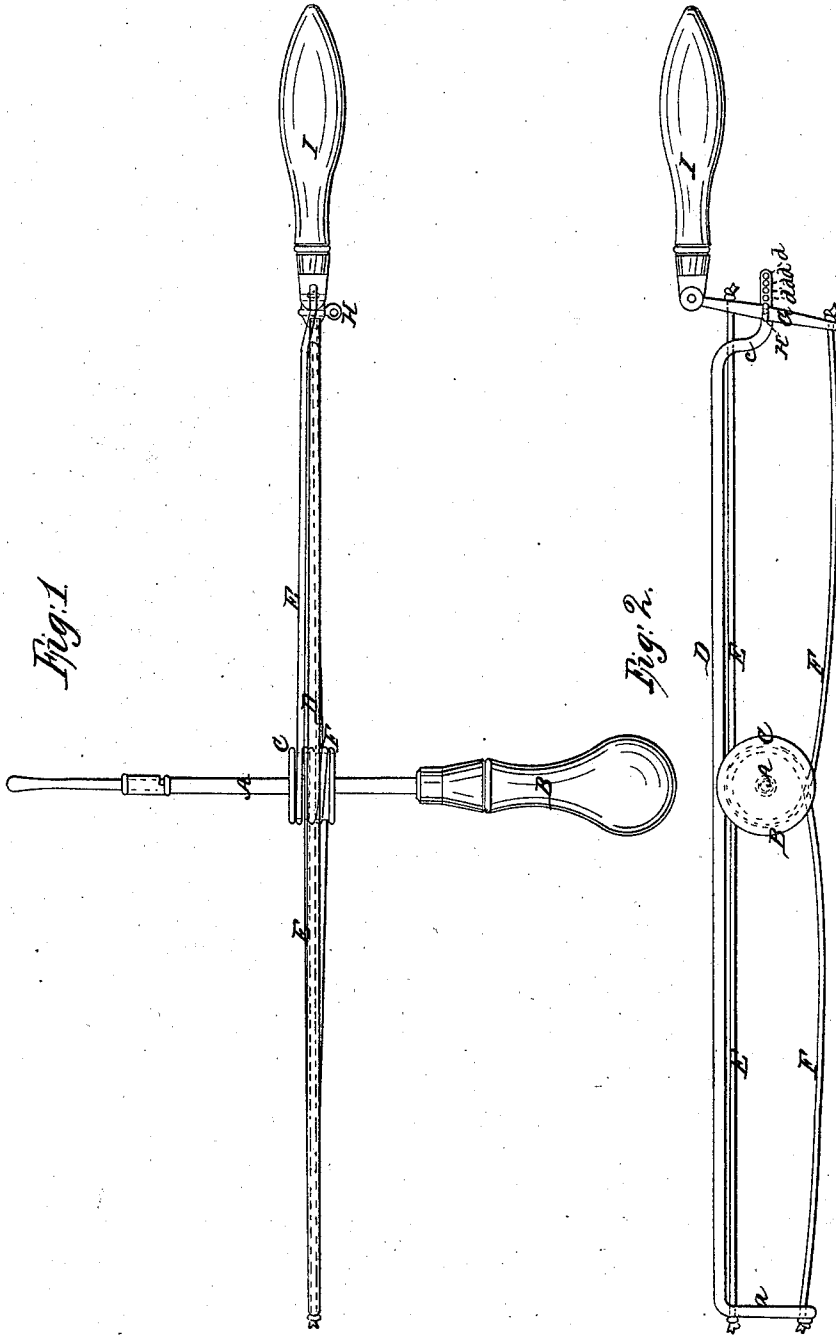


C. S. Harris,

Converting Motion.

N^o 11/23.

Patented June 20, 1854.



UNITED STATES PATENT OFFICE.

CHARLES S. HARRIS, OF HOLYOKE, MASSACHUSETTS.

IMPROVEMENT IN PRODUCING CONTINUOUS CIRCULAR FROM RECIPROCATING RECTILINEAR MOTION.

Specification forming part of Letters Patent No. **11,123**, dated June 20, 1854.

To all whom it may concern:

Be it known that I, CHARLES S. HARRIS, of Holyoke, in the county of Hampden and State of Massachusetts, have invented a new and useful Method or Contrivance for Producing a Continued Circular Motion from a Reciprocating Rectilinear Motion, such being particularly applicable to hand-drills or various other tools or mechanism used in the arts; and I do hereby declare that the same is fully described and represented in the following specification and the accompanying drawings, letters, and references thereof.

The said drawings exhibit my invention as applied to the shaft of a hand-drill, the stock or handle of which is to be held in one hand of a person while the mechanism for rotating the drill mandrel or shaft is operated by the other hand of the holder.

Figure 1 is a top view, and Fig. 2 is a side elevation, of the said drill-stock and the said mechanism for operating it.

In the said drawings, A denotes the drill mandrel or shaft, which is extended from and made to freely rotate in a handle B. On this shaft or mandrel a double grooved pulley C is fixed so as to turn with the shaft. Extending over this pulley is a long rod D, which is bent at its two ends, as seen at *a* and *c* in Fig. 2, the latter part *c* being provided with a series of holes *d d d* made through it. A lever G, jointed at its upper end to a handle I, is connected to the part *c* of the rod D by means of a pin or fulcrum H, the rod being made to extend through the lever and the lever to turn or vibrate freely on the pin. Attached to one arm of the lever G is a draw cord or band E, that is continued to the top surface of one of the grooves of the pulley C and wound once around said pulley and extended therefrom and fastened to the upper part of the bent portion or arm *a* of the rod D. Another chain, cord, or band F has one end attached to the other or lower arm of the lever G, and is from thence continued to the under side of the other groove of the pulley C, and thence wound around the said pulley and continued and fastened to the lower end

of the arm *a*, the whole being substantially as seen in Figs. 1 and 2, in the latter of which the pulley C is denoted by dotted lines. The length of each cord is to be such that when the lever G is turned on its fulcrum in either direction it shall draw one of the cords tight and loosen the other cord. Now if, while the handle B is grasped in the left hand of a person, the handle I is taken by him in his right hand and he moves it and the rod D forward and backward in longitudinal directions or with a reciprocating rectilinear motion, he will produce a continued circular rotation or motion of the drill-shaft, each of the cords E F being alternately drawn upon and loosened by the peculiar action of the lever G induced by the pressure and draft of the handle I.

I would remark that I am aware that racks and pinions have been combined so as to produce a continuous rotary motion from a reciprocating rectilinear one.

I do not claim a rack and pinion or the duplication of the same, or a combination of two racks and pinions, or two racks and a semi-pinion so applied as to produce circular motion from a rectilinear motion. Nor do I claim the combination of a bow and string or band with a pulley for obtaining a circular motion from a rectilinear motion nor the mere duplication of such devices; but

What I do claim is—

The so combining with the bow or bar D and the two bands E F and the handle I (or its equivalent) a vibratory or rocker lever G that during the reciprocating rectilinear movements of the bar or bow D caused by the power applied to such rocker-lever it shall be made to operate so as to alternately tighten and loosen each cord upon the pulleys of the drill-stock, as specified, and so as to cause the drill-stock to be rotated, as described.

In testimony whereof I have hereto set my signature this 5th day of October, A. D. 1853.

CHARLES S. HARRIS.

Witnesses:

R. H. EDDY,

F. P. HALE, Jr.