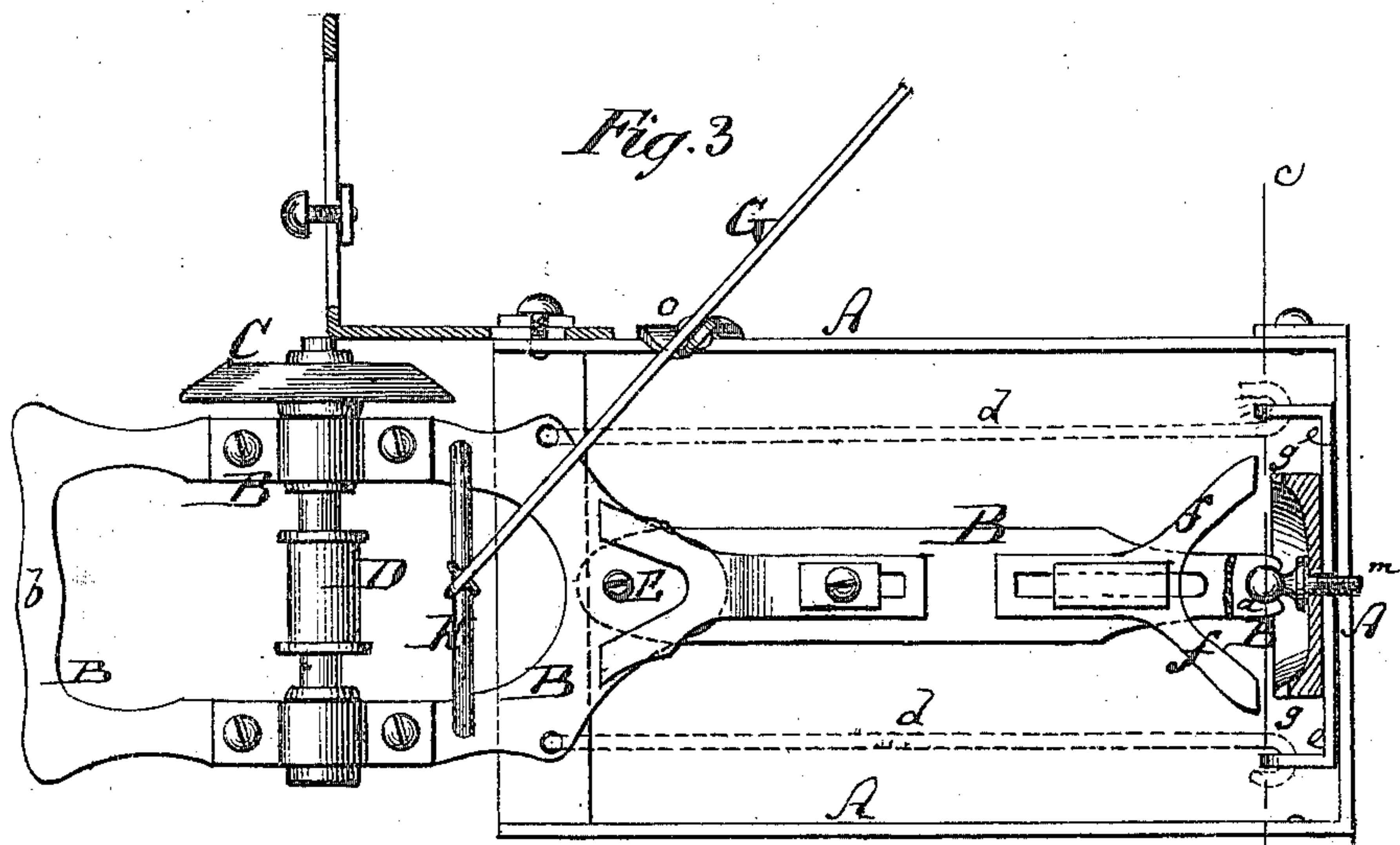
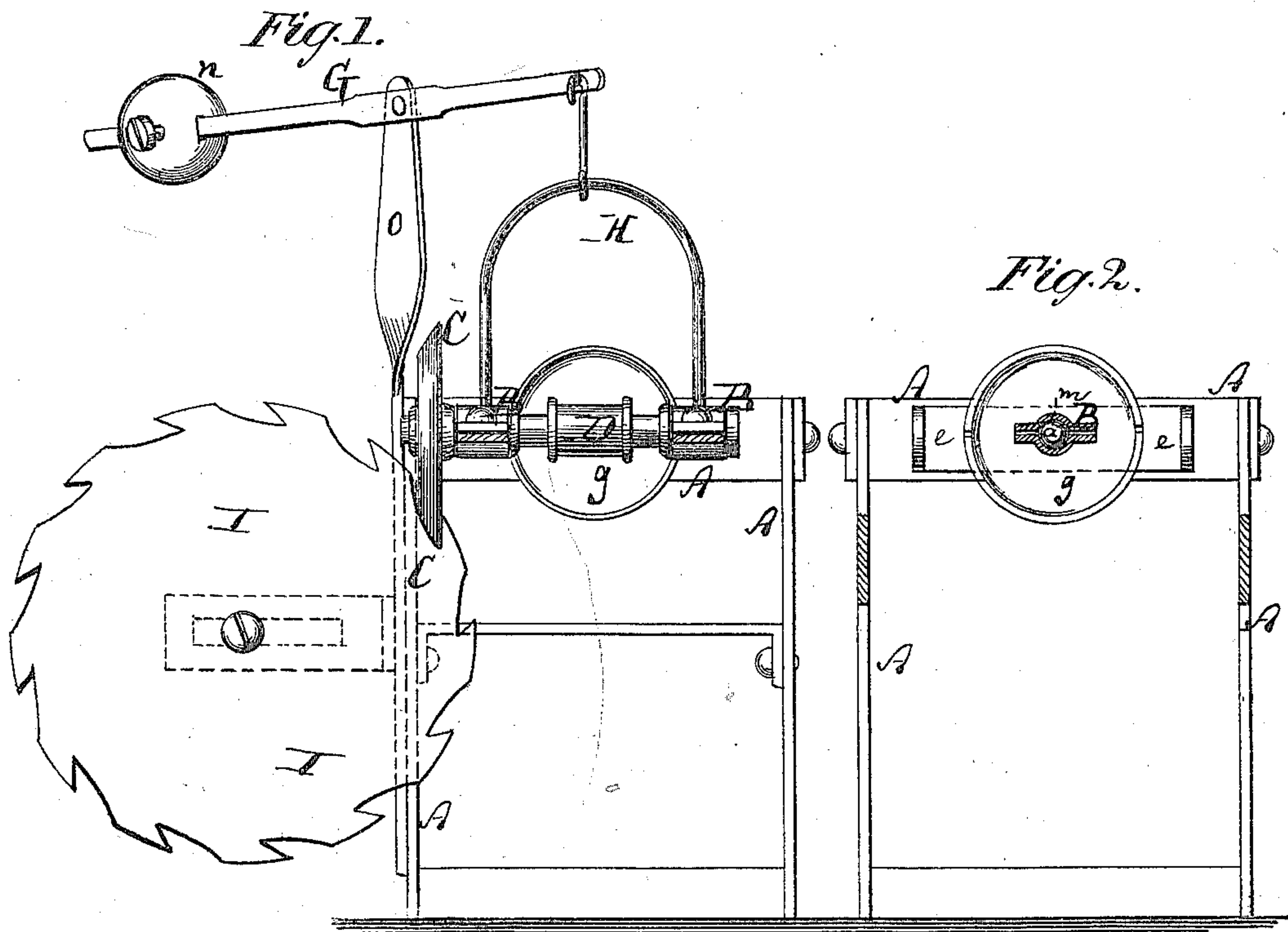


F. E. FREY.

Flexible Saw-Filing Apparatus.

No. 134,425.

Patented Dec. 31, 1872.



Witnesses:

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UNITED STATES PATENT OFFICE.

FREDERIC E. FREY, OF BUCYRUS, OHIO.

IMPROVEMENT IN FLEXIBLE SAW-FILING APPARATUS.

Specification forming part of Letters Patent No. 134,425, dated December 31, 1872.

To all whom it may concern:

Be it known that I, FREDERIC E. FREY, of Bucyrus, in the county of Crawford and State of Ohio, have invented a new and Improved Flexible Grinding Apparatus, of which the following is a specification:

Figure 1 is an end elevation of my improved grinding apparatus; Fig. 2, a vertical transverse section of the same on the line *c c*, Fig. 3; and Fig. 3, a top view, partly in section, of the same.

Similar letters of reference indicate corresponding parts.

This invention relates to a new grinder-machine for sharpening or gumming saws, circular or upright, sharpening molding-bits, or other articles for which emery or grinding wheels are used. The invention consists more particularly in hanging the emery-wheel in a jointed frame, which, by virtue of its several joints, is under full and absolute control of the operator, who can therefore set and apply the grinding-wheel at any suitable angle to the article to be sharpened.

In the drawing, the letter A represents the frame of the machine, which can be varied in size or material to suit the different kinds of work to be performed. B is a swinging or movable frame, hung by a horizontal pin, *m*, to the end of the frame A, the pin *m* connecting, by a ball-joint, *a*, with the frame B, so that a universal movement up, or down, or sidewise can be given to the emery or grinding wheel C hanging in said frame B by the hand of the operator, who has hold at *b* of the frame B. The emery or grinding wheel is mounted upon a shaft, D, that hangs in the frame B, and which is rotated by a belt or other suitable mechanism, said belt, if used, coming from a point back of the ball-joint and straddling it. Aside from the universal joint *a*, the frame B has a second joint at or near its middle at E, which second joint allows additional freedom of movement, and enables the operator to swing the front part of the said frame B on the pivot E, and to bring the emery-wheel in to any desired position. The said forward

part of the frame B may, however, be connected by rods *d d* with a bar or yoke, *e*, that is hung to the pin *m*, and may thereby be locked to be only up and down adjustable, and have no swing on the pin *m*, whenever it should be desired to give only an up and down and a straight side motion to the emery-wheel, and thus to keep the said wheel square to the work. By a slide, *f*, on the back part of the frame B, the said frame can be locked against a notched cup, *g*, that is also hung upon the pin *m*, for the same purpose of locking the frame B to make it only vertically movable. G is a lever, pivoted to a post, *o*, of the frame A, and weighted at one end by a ball, *n*, or other weight, and connected at the other end by a jointed frame, H, with the forward part of the frame B for balancing the same and the emery-wheel.

Thus, by this apparatus, the emery-wheel can be applied at any suitable angle to a circular saw, I, or any other instrument for sharpening the same or parts of the same, and will be balanced, and the attendant thereby relieved from excessive labor by the weight on the frame.

The weight *n* may be made adjustable on the lever G to regulate its balance in accordance with the weight of the wheel C.

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

1. The vibrating frame B, connected by a ball-joint with the frame A, and carrying the grinding-wheel C to enable the application of the same at a suitable angle, as set forth.

2. The slide *f*, rods *d*, cup *g*, and yoke *e*, arranged in connection with the jointed frame B, substantially as specified.

3. The weighted lever G, connected with the jointed and vibrating emery-wheel frame B to balance the same, substantially as described.

FREDERIC E. FREY.

Witnesses:

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