

Saw-Sharpening Machines.

Patented May 20, 1873.

Fig. 1

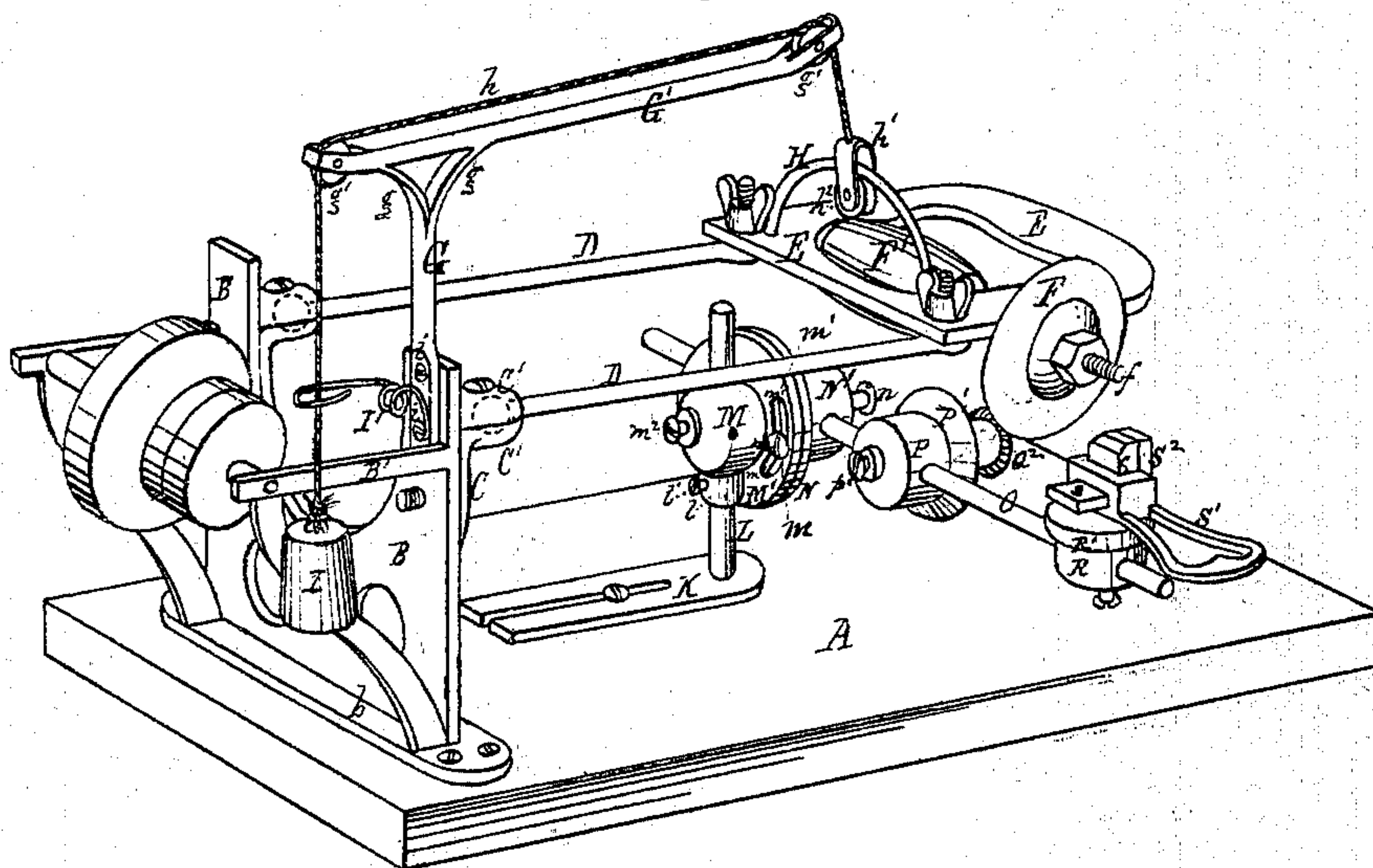


Fig. 2.

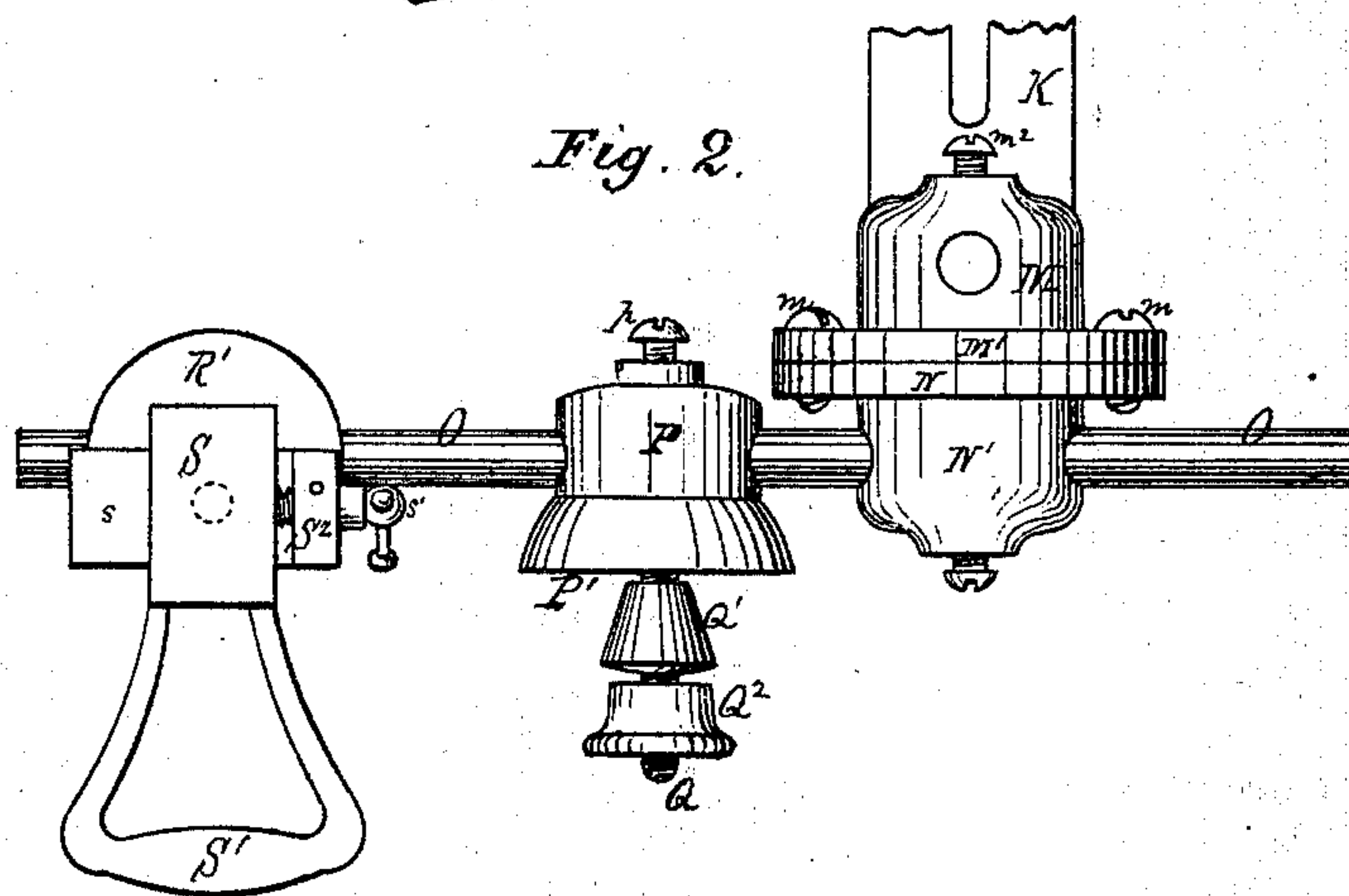
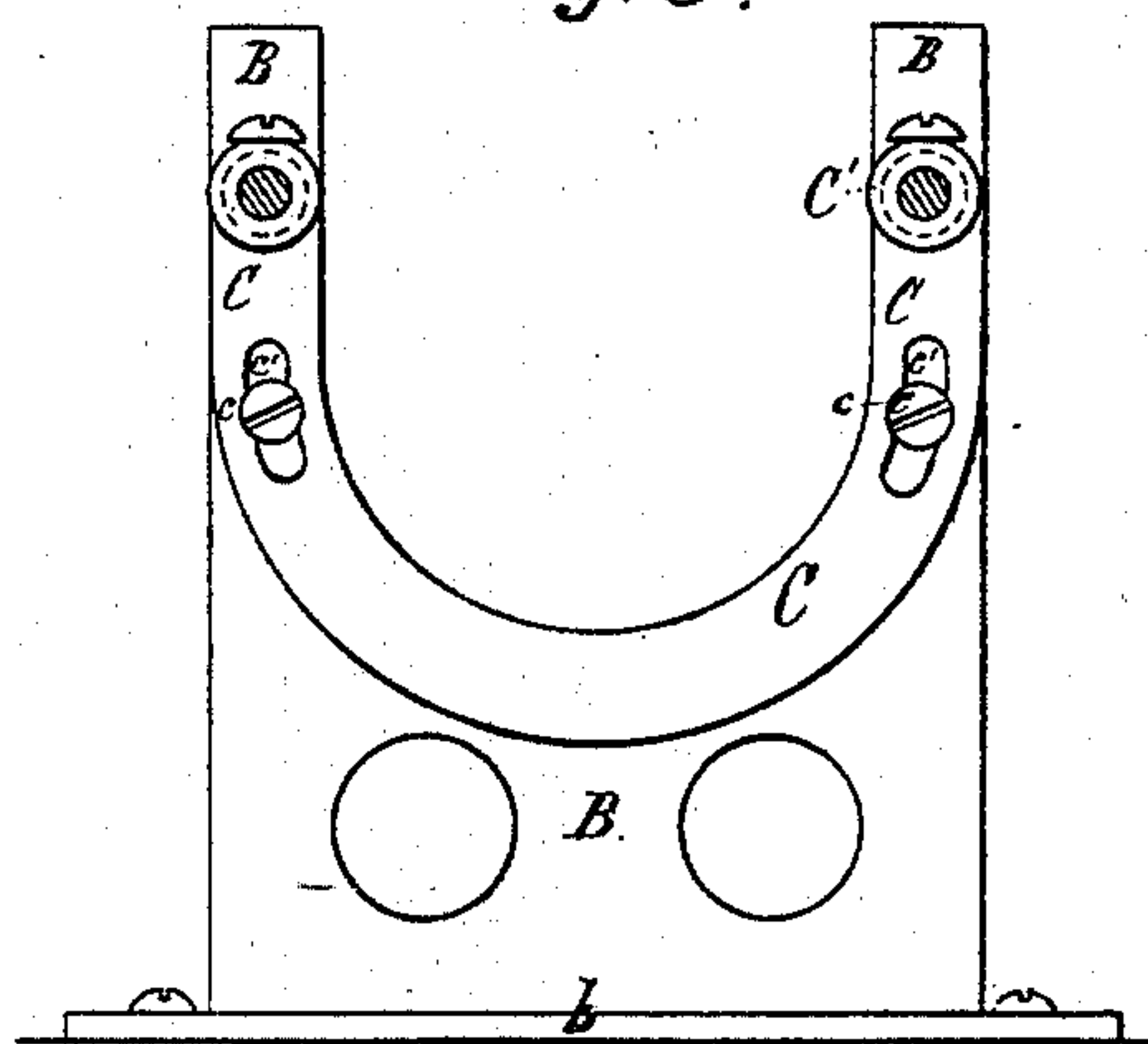


Fig. 3.



Inventor.
Frederic E. Frey
by Will Smith
attorney

UNITED STATES PATENT OFFICE.

FREDERIC E. FREY, OF BUCYRUS, OHIO, ASSIGNOR TO FREY, SHECKLER & CO., OF SAME PLACE.

IMPROVEMENT IN SAW-SHARPENING MACHINES.

Specification forming part of Letters Patent No. 139,139, dated May 20, 1873; application filed March 20, 1873.

To all whom it may concern:

Re it known that I, FREDERIC E. FREY, of Bucyrus, Crawford county, State of Ohio, have invented certain new and useful Improvements in Machines for Grinding Saws, Molding-Bits, and other Tools, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, in which—

Figure 1 is a rear perspective view of my improved machine for grinding saws, molding-bits, &c. Fig. 2 is a plan or top view of the supporting-arm with its saw and bit-clamps, and Fig. 3 is a face view of the adjustable sector-plate to which the arms of the flexible wheel-frame are connected.

Similar letters of reference denote corresponding parts in all the figures.

My invention has for its object the improvement of the machine for grinding saws, &c., upon which Letters Patent were granted to me on the 31st day of December, 1872; and consists, first, in combining the flexible frame, in which the grinding-wheel is mounted, with a sector-plate or frame, which is made adjustable in the arc of a circle for changing the angle of the flexible frame, and thereby increasing the extent of its movement and consequently adapting the machine to do a greater variety of work; second, in combining with the flexible grinding-wheel frame an overhanging stationary arm and counterpoise for balancing the wheel-frame and holding in any desired position; and, third, in the construction and arrangement of the tool-supporting arm, and its vices or clamps, whereby the saw, molding-machine bit, or other tool to be operated upon or ground may be readily adjusted to and held or set in any desired position, as hereinafter set forth.

In the accompanying drawing, A represents the base-plate, platform, or table, of any suitable or preferred construction, upon or near one end of which is secured an upright frame or standard, B, said standard or frame extending transversely across table A, and being secured thereto by a horizontal flange or foot-piece, b, and bolts or screws at b'.

This upright frame may be made or cast in a single piece, substantially in the form shown in Figs. 1 and 3; or it may be made of vertical side standards and horizontal connecting-bars, and of any suitable material, as may be preferred. To the upper end of this frame, and upon its rear or outer face, horizontal arms B' are to be connected, either rigidly or adjustably, in the outer ends of which bearings are provided for an adjustable counter-shaft, provided with fast and loose driven pulleys, and a driving-pulley, from which motion is imparted to the grinding-wheel shaft or working parts of the machine. I prefer to make this counter or driving shaft adjustable for giving proper tension to the driving-belt, either by adjusting its supporting-arms or by adjusting the shaft in its bearings therein in any suitable manner. The standard or frame B is cut away into U-form or left open at its upper end to provide for the passage of the driving-belt, and has attached to its inner vertical face of the standard B a U-shaped plate, C, made in form substantially as shown in Fig. 3, said plate, which I call a sector-plate or frame, being secured to the standard by bolts or set-screws c passing through curved concentric slots c' c' therein for permitting the adjustment of the sector-plate in the arc of a circle. To the upper ends or arms of this plate are secured divided socket-plates C', adapted to receive balls or knobs formed on the ends of parallel rods or bars D, and to permit a universal-joint movement of the same therein within the required limits. The outer ends of these rods are bent upward at right angles and, passing through a connecting end and handle-plate, E, are provided each with a screw-thread and thumb-nut, or equivalent device, by means of which the plate E may be clamped firmly down upon the ends of the arms D D for making the connection rigid or loosened for permitting freedom of movement of the parts, relatively, as described. The plate E is provided with suitable bearings for the shaft f of the grinding-wheel F, and is open or slotted centrally to permit the driving-belt to pass

through it and receive the spherical or barrel shaped pulley F' , the form of which is such as to permit its shaft to be turned to any required angle of relation to its driving-pulley on the counter-shaft without twisting the driving-belt passing around said pulley F' . To one side of standard B is attached an upright, G , forked at its upper end, and supporting upon its arms or forks $g g$ a stationary horizontal arm or bar, G' , overhanging the flexible wheel-frame $D E$ provided at each end with a grooved friction-pulley, g' , over which a cord, h , passes, said cord being connected at one end by a pendent loop, h^1 , provided with a friction-pulley, h^2 , in its lower open end with a bent bail-rod, H , attached to the outer end of the flexible wheel-frame, as shown. By this arrangement the pulley rides freely back and forth under the bail-rod, and gives the required freedom of movement to the flexible frame in a manner that will be readily understood. The opposite end of the cord h is connected with a counterpoise-weight, I , or spring I' , either or both, as may be preferred, of sufficient weight or tension to balance the flexible wheel-frame and to hold them at any point at which they may be set or adjusted. Where the spring is used it may be connected with an adjustable plate, i , for regulating the tension of the spring as desired. K is the tool-holder base-plate, slotted longitudinally, and secured adjustably to the table or base-plate A by a set-screw, k . This plate is armed with a cylindrical upright, L , upon which is an adjustable collar, l , secured at any desired height on the upright or shaft L by a set-screw, l' . M is a perforated hub or boss mounted in the upright L , and provided at one end with a vertical slotted disk, M' . N is a second disk, secured to the disk M' by set-screws, at m , passing through curved slots m^1 . The disk N has also a perforated hub, N' , in which is mounted a horizontal cylindrical rod or supporting-arm, O . A holding or set-screw, m^2 , in hub M , permits the adjustment of the disks M' and N and supporting-arm O around the upright L and in the arc of a horizontal circle, and a set-screw, n , in hub N , permits the rotation of the rod or arm O in the hub N . The rod or arm O has mounted upon it the clamp or clamps for holding the saws or tools operated upon, as follows: P represents a perforated hub, through which the rod O passes, and which is secured in the desired relation to said rod by a set-screw, p . The outer or front end of this hub is provided with an enlarged cup-shaped clamping-face, P' , provided centrally with a bolt, Q , upon which is mounted a loose clamping-washer, Q^1 , and a thumb-nut, Q^2 . When used for holding circular saws for grinding, a conical-shaped washer is shown, adapted to fit any size of central perforation in the saw, and to clamp the saw to the clamp-face P ; but

when used for long saws a flat washer may be substituted for the conical washer Q^1 . R represents a second sliding, adjustable, and removable hub, mounted on arm O . To this hub is secured a disk, R' , perforated vertically or at right angles to the perforation, through which rod O passes to receive the pivot of a swiveling-jaw, S , provided with a handle, S^1 , for holding and turning said jaw. S^2 is a sliding jaw, connected with jaw S by a slide, s , and an adjusting-screw, s' , by means of which the clamp or vise may be operated.

From the foregoing description of parts it will be readily understood that the grinding-wheel F , mounted in its flexible frame, as described, may be raised or lowered relatively to its supporting-table and work; may be moved laterally on its parallel links $D D$; that the angle of the wheel to the table or work may be varied by twisting the flexible frame on its ball-and-socket joints, or still further varied by the adjustment of the sector-plate C —all without interfering with its driving-belt; and, at the same time, it may be raised clear of its work and left at any point, supported by its properly-adjusted counterpoise; also, that the saw or other tool operated upon may be adjusted or set at any desired angle of relation to the grinding-wheel by means of the disks M' and N and the vertically and horizontally swiveling and adjustable supporting rod or arm O and the clamps swiveling thereon; and, further, in the case of the clamp or vise $S S^2$, which is provided with a second pivot at right angles to rod O , thereby greatly increasing the capacity of the machine and its adaptation to every form and variety of molding-plane and machine-bits.

The clamp Q is more particularly designed for saws and the vise or clamp $S S^2$ for bits and other tools; but both may be used for long saws when desired.

The machine will also be found useful for the purpose of abrading or grinding metals into any desired form, and, of course, any approved or desired form or construction of grinding-wheel may be applied adapted to the purpose for which it is required.

Having now described my invention, what I claim is—

1. The slotted open arc or U-shaped plate C , in combination with the flexible wheel-frame or frame-bars $D D$ hinged thereto, substantially as described, whereby the usual central pivotal support for adjusting the angle of said frame is dispensed with, and all cramping of the driving-belt avoided.

2. The parallel links or bars $D D$ of the flexible wheel-frame, united at their inner or heel ends to the adjustable arc or sector plate C by the ball-and-socket joints C' , and at their outer swinging ends with the bar E , in the manner and for the purpose described.

3. The flexible wheel-frame, in combination

with the overhanging stationary frame or arm G' and counterpoise for balancing the wheel-frame, arranged and operating substantially as described.

4. The holding clamp or vise S S², made adjustable upon or around its supporting arm or rod, and upon a second center or pivot ar-

ranged at right angles to said rod or arm, for adjusting the position of the clamp or vise, as described.

FREDERIC E. FREY.

Witnesses:

J. T. THOMAS,
ALEXR. MAHON.