J. WHEELOCK.

Improvement in Milling-Machines.

No. 129,876. Patented July 23, 1872.

Fig. 1.

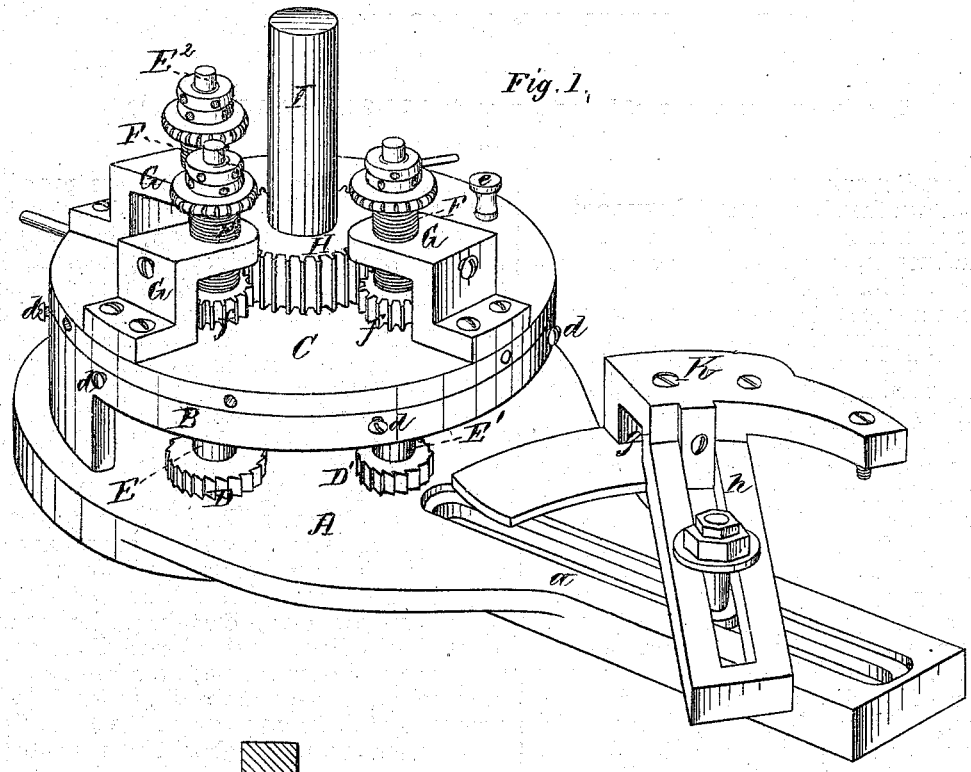


Fig. 2.

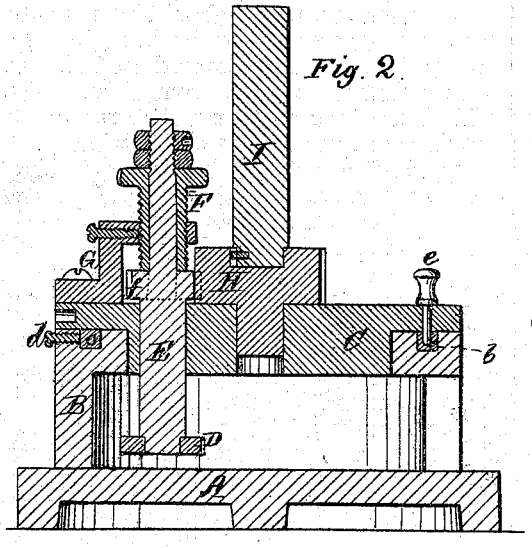
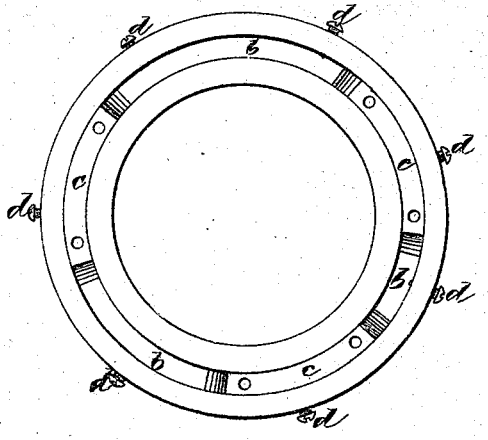


Fig. 3.



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JEROME WHEELOCK, OF WORCESTER, MASSACHUSETTS.

IMPROVEMENT IN MILLING-MACHINES.

Specification forming part of Letters Patent No. **129,876**, dated July 23, 1872.

To all whom it may concern:

Be it known that I, JEROME WHEELOCK, of the city and county of Worcester, in the State of Massachusetts, have invented a certain new and Improved Milling-Machine.

My improvement consists in a novel construction, combination, and arrangement of the bed, driving mechanism, work-holder, and one or more milling tools or cutters, by which the machine is adapted to receive power from an ordinary upright drilling-machine, or even a lathe under some circumstances; and I do hereby declare that the following specification, taken in connection with the drawing furnished and forming a part of the same, is a clear, true, and exact description of a machine involving my invention.

Referring to the drawing, Figure 1 represents one of my machines in perspective. Fig. 2 represents the same in cross vertical section on the line of the diameter of the vertical central driving-spindle. Fig. 3 represents a top view of the circular portion of the bed-plate, with its top plate, driving mechanism, and milling-tools removed.

A denotes the base-plate. It is planed off on the bottom to secure a firm bearing. At one end it is circular, and is provided with a radial slotted arm or extension, *a*. B denotes the bed-plate, which is mounted upon the circular end of the base-plate. In this instance the two pieces are cast separately, although it will be practicable to cast them in one piece. The bed-plate consists of a circular ring-like structure, with one-half of its circumference cut away from the bottom to a point near the top, so that at the latter point it retains its ring-like character. On the upper edge it is provided with an annular groove, *b*. The center of the portion which is cut away on the side of the bed-plate is on a line with the longitudinal central line of the radial arm of the base-plate. C denotes the top plate. It is a flat circular plate corresponding with and fitted to the top of the circular bed-plate. The top plate, bed-plate, and base-plate may, as a whole, be properly termed the bed of the machine. The vertical edge of the top plate is provided with several holes for the reception of a hand-pin, with which the top plate may be revolved on the bed-plate. In the groove *b*, on the upper edge of the bed-plate B, there are three stop-blocks, *c*, which are provided with vertical pin-holes, and have their two ends rounded or beveled down from the upper surface. Several set-screws, *d*, entering the groove *c* through the periphery of the bed-plate B, are arranged to engage with these stop-blocks and hold them firmly in any desired position. A set-pin, *e*, on the top plate, which occupies a hole therein near its outer edge, is arranged to enter any one of the pin-holes in any of the stop-blocks *c*, and thus secure the top plate against any rotary movement when in working position. D and D′ denote two of three milling tools or "cutters." The third one is not shown. These cutters are mounted, respectively, on the lower ends of vertical rotating spindles E, E^1, and E^2. When more than one cutter is combined with the machine they will preferably be of different dimensions, and each intended for the execution of some special separate work, or for the performance of different parts on the same piece of work, and, therefore, should be so arranged that each separately can be brought into operation in the order required, and also so arranged that the vertical central line of each when in working position will correspond with the line occupied by the cutter which preceded or which may follow it. The several spindles E are provided with vertical bearings in the top plate. Above the top plate they are incased within sleeves or bushings F provided with exterior screws, which are sustained in and tapped to the brackets G, which are in turn permanently secured radially on the upper surface of the top plate. Each is provided with a set-screw entering through the bracket for engaging with the bushing and holding it in proper position. The upper ends of the spindles E are also provided with screw-threads, and two holding-nuts are arranged thereon for securing the spindles against any vertical movement independent of their sleeves or bushings. Each spindle E is also provided with a pinion, *f*, which is keyed thereto at such a point above the lower end of the spindle as will admit its cutter to work close to the surface of the bed-plate.

H denotes a main or central driving-gear; it is provided with an axial extension, which is fitted to a vertical bearing in the top plate. It engages with the several pinions *f* on dif-

ferent sides of its periphery, and has a greater length of tooth than the pinions, which admits of the free vertical movement of the spindles and their pinions while continuing in proper working relation. The gear is drilled out on its upper side, forming therein an axial eye, into which the driving-spindle I is fitted, and from which it can be readily removed. The eye may be square, with the end of the spindle corresponding, or provided with a groove and combined with a stationary key on the driving-spindle. K denotes a work-holder. In this instance it is represented as fitted for executing segmental work, like metallic steam-packing, for instance. It consists of a segmental spout-like receptacle, *g*, and a straight slotted arm, *h*, through which it is connected by means of a bolt with the slotted radial arm or extension *a* of the base-plate. It can be set at and secured in any desired position.

The "work" is inserted through the opening in *g*, and is supported on the platform adjacent thereto and securely held by means of set-screws entering the opening from the upper portion of the holder above the receptacle *g*. When in this position the required milling-tool is brought into contact with the work and adjusted with proper relation thereto. Whenever it is necessary the "piece of work" may be more securely held by wedging between its upper surface and the under edge of the projecting portion of the bed-plate adjacent thereto, or a set-screw may readily be applied through a projecting ear or lug, which may be cast on the periphery of the bed-plate below the edge of the top plate. In milling small pieces of work it frequently occurs that a large number of pieces are presented, one by one, to the milling-tool; it is, therefore, essential that the tool be located in precisely the same position every time; this fixed adjustment is accomplished by loosening one of the several stop-blocks *c* and placing the stop-pin into one of the holes therein. When the milling-tool is in proper position the set-screw next adjacent to the stop-pin is turned up tight against the stop-block, with which the stop-pin engages, thus preserving a precise and accurate means of adjustment. When the three milling-tools are to be employed successively on the same piece of work they are each to be brought into proper position and the several stop-blocks *c* arranged with relation thereto, respectively, in the manner already described. For some kinds of work the "holder" will preferably operate longitudinally instead of radially; in such case the usual arrangement of an operating-screw can be applied for advancing the work to the mill, while the main holder can be attached to the base-plate by a bolt or bolts, as shown in this instance.

When operated as a fixture my machine can be mounted on a work-bench, for instance, and the driving-spindle be sufficiently extended to receive the belt or the gearing. When, however, it is desired for special work or temporary service, the machine can be wedged or keyed to the bed-plate of a drilling-machine; the driving-spindle I can be introduced therein after the manner of a drill, and the two can then be brought together and operatively connected or disconnected by raising or lowering the bed-plate of the drilling-machine in a manner common thereto. Although it is not so convenient a method, my machine may be used in a lathe in cases of necessity. The driving-spindle I will then be inserted in a chuck and the milling-machine be supported in a tool-rest and held firmly on its side in position by pressure from the fixed center of the lathe brought up against a block between it and the lower (then vertical) surface of the base-plate.

Having thus described my invention, I claim—

1. The combination, with a suitable frame, of the plate C′, capable of rotation and fixed adjustment thereon, the series of adjustable milling-tools supported on said plate, and mechanism to communicate rotary motion from a central driving-gear, substantially as described.

2. The movable and adjustable stop-blocks *c*, capable of being fixedly attached to the bed, in combination with the rotating top plate of a milling-machine, upon which the milling-tools are mounted, and a stop-pin, by which the top plate and the mills may be secured in any desired position, substantially as described.

3. The improved portable milling-machine, consisting of the combination, with the supporting-frame, of the top plate C, capable of rotation and fixed adjustment thereon, the series of adjustable milling-tools, the driving-gearing, central spindle, and a suitable work-holder, substantially as described.

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