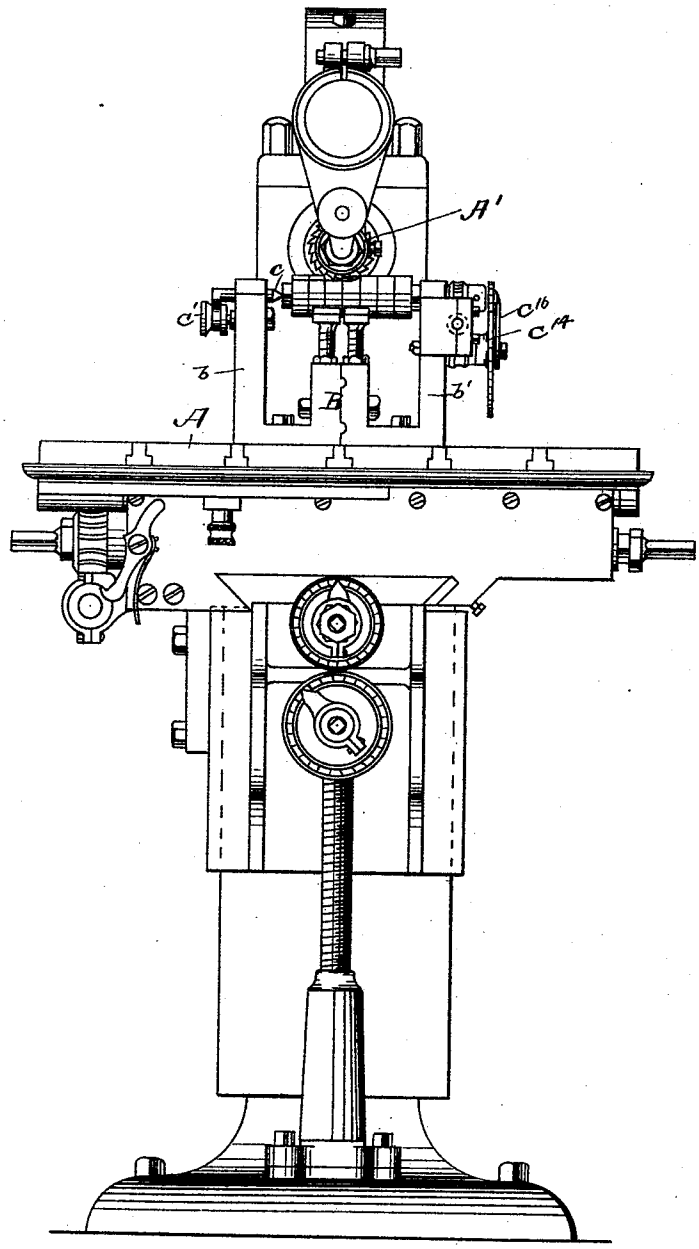
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C. H. TRASK.

WORK HOLDER FOR MILLING MACHINES.

No. 414,174. Patented Oct. 29, 1889.



WITNESSES.
L. M. Dolan
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Fig. 1.

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Clarke & Raymond

N. PETERS. Photo-Lithographer, Washington, D. C.

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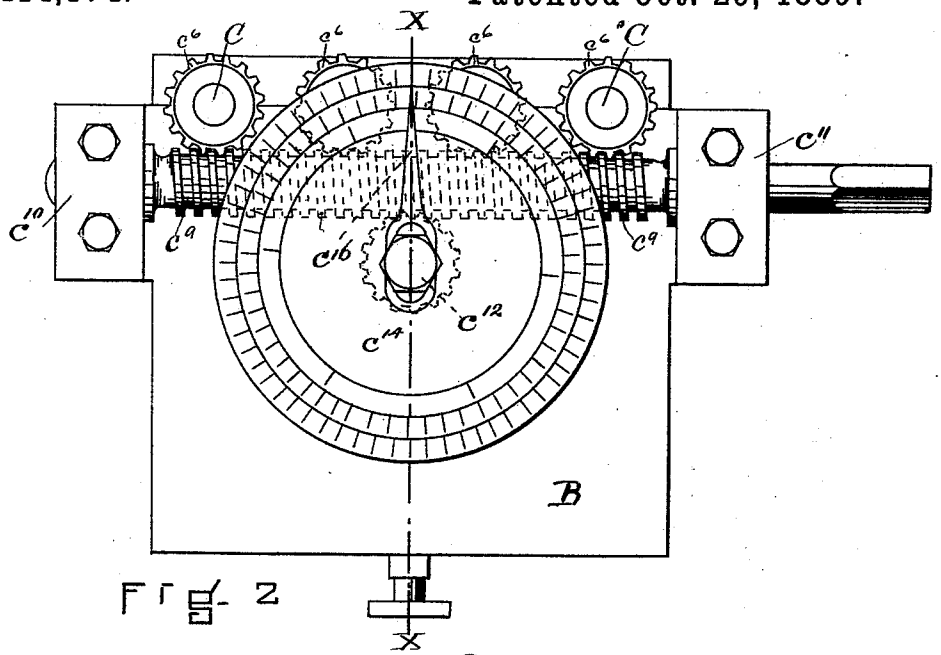


Fig. 2

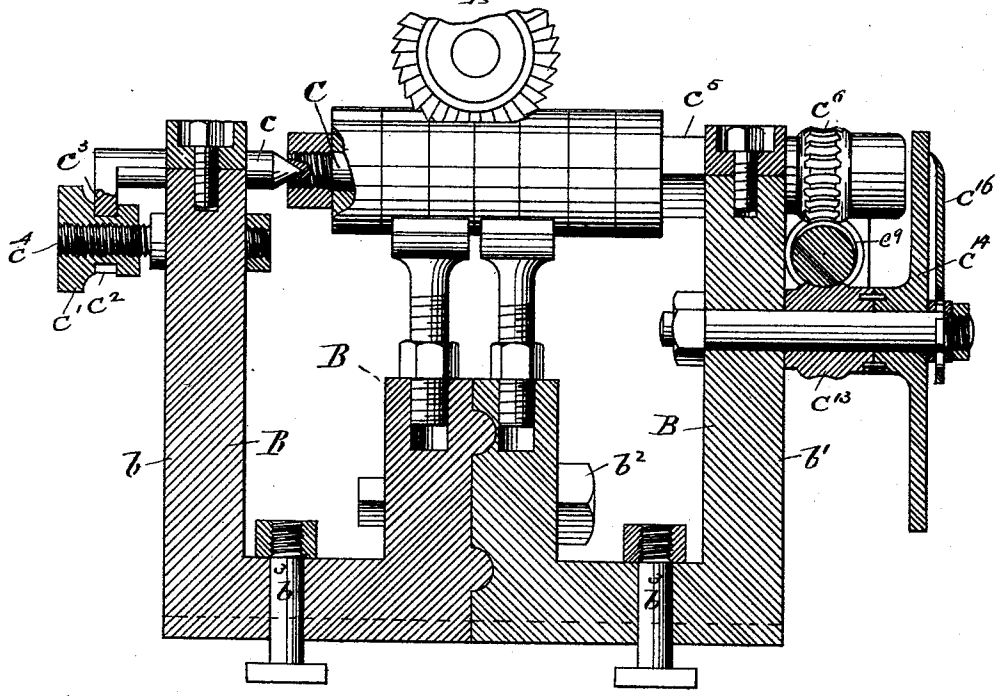


Fig. 3.

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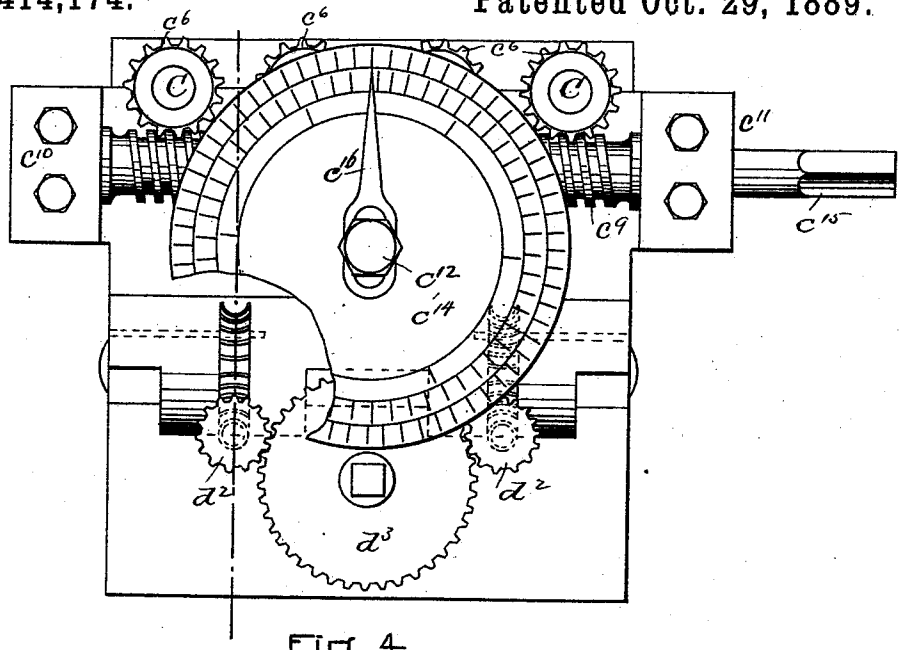


Fig. 4.

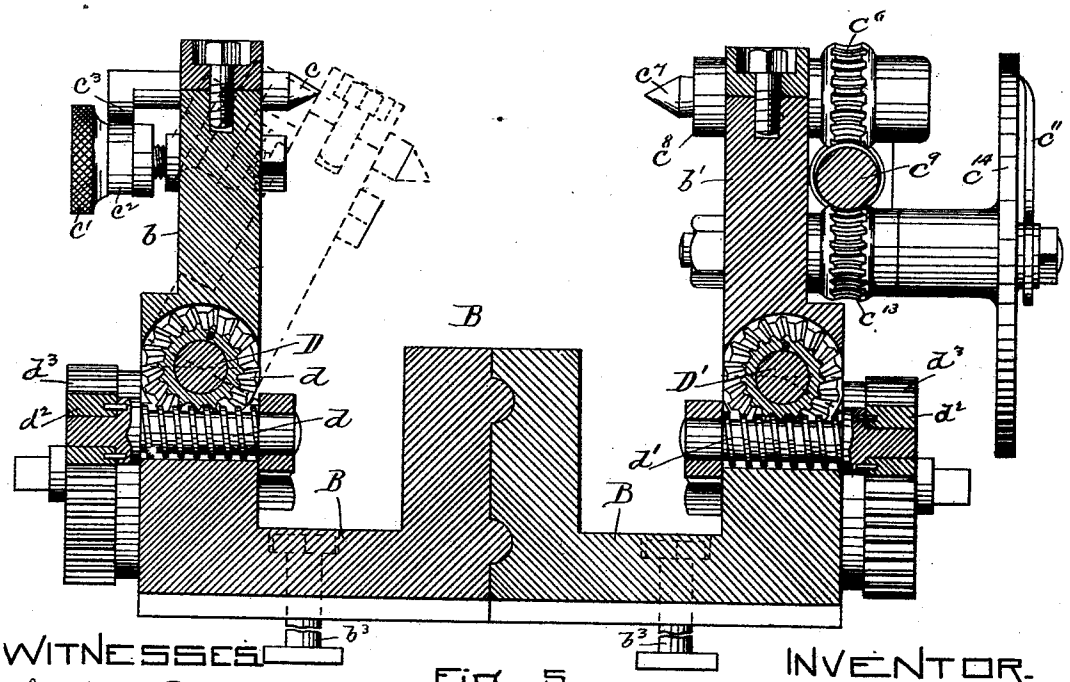


Fig. 5.

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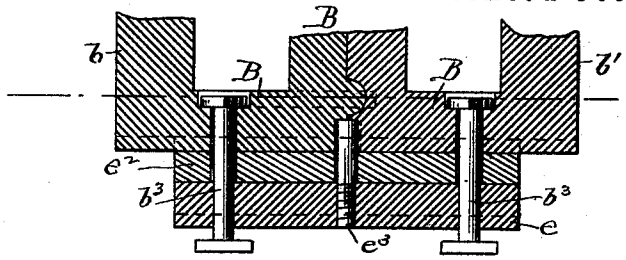


Fig. 7.

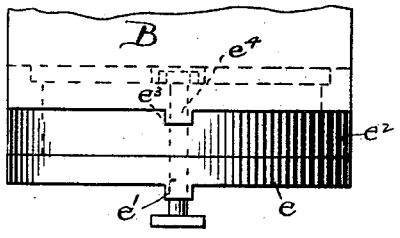


Fig. 8.

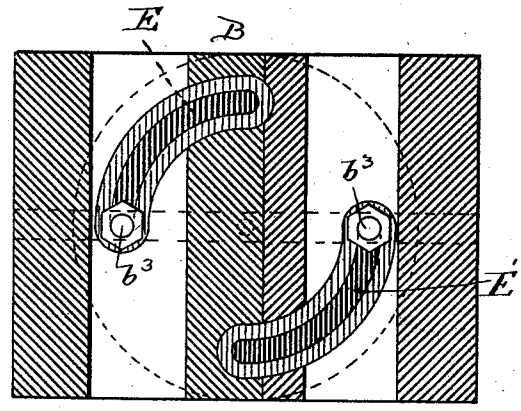


Fig. 9.

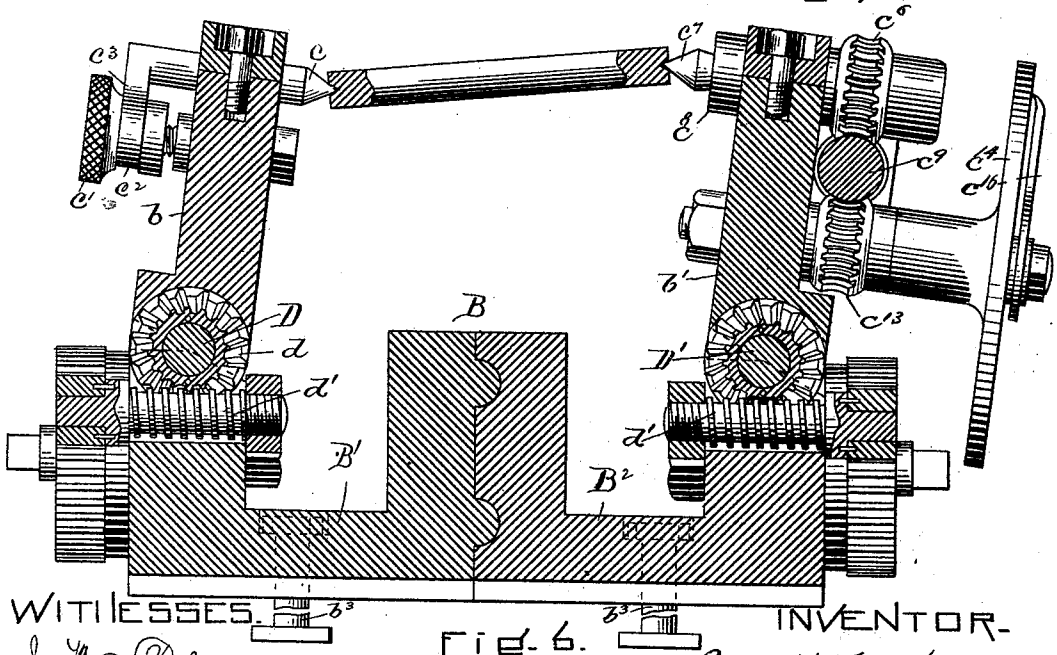


Fig. 6.

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C. H. TRASK.

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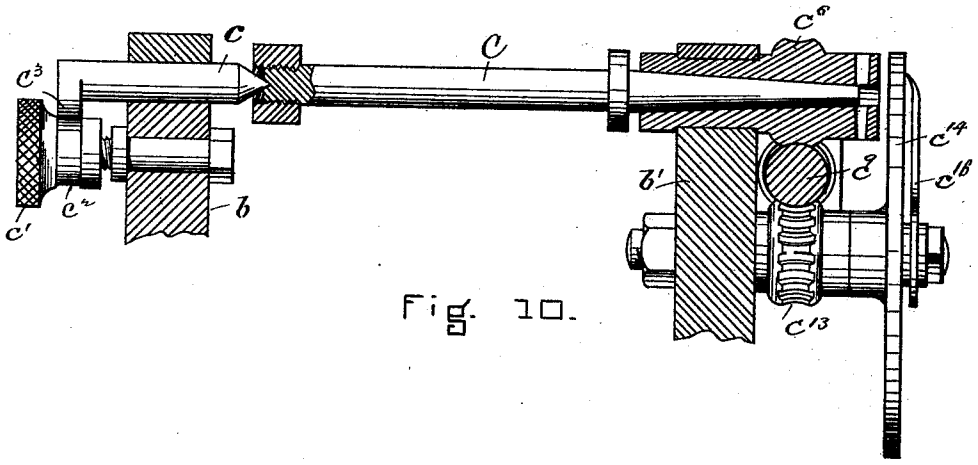


Fig. 10.

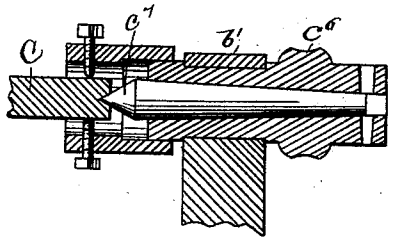


Fig. 11.

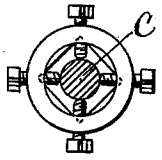


Fig. 12.

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UNITED STATES PATENT OFFICE.

CHARLES H. TRASK, OF LYNN, MASSACHUSETTS.

WORK-HOLDER FOR MILLING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 414,174, dated October 29, 1889.

Application filed March 12, 1888. Serial No. 266,936. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. TRASK, of Lynn, in the county of Essex and State of Massachusetts, a citizen of the United States, have invented a new and useful Improvement in Work-Holders for Milling-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

This machine is an improvement upon the machine described in my application for Letters Patent of the United States, filed March 28, 1887, Serial No. 232,795, allowed August 16, 1887; and it relates to various details of construction or organization, whereby the efficiency of the machine is increased and the range of its work extended.

In the drawings, Figure 1 is a view in front elevation of a milling-machine having my improvement. Fig. 2 is a view in elevation representing the part or section which I term the "work-holder," and to which my invention appertains. Fig. 3 is a view in vertical section upon the line $x\,x$ of Fig. 2. Figs. 4, 5, and 6 illustrate an additional feature of the invention, to which reference will be hereinafter made. Figs. 7, 8, and 9 refer to devices for adjusting the work-holder upon the bed of the milling-machine. Figs. 10, 11, and 12 refer to various means for supporting the arbors for holding the blanks in line.

A is the bed of the milling-machine.

A′ is the milling-tool of the machine.

B is the base piece or frame of the work-holder. It preferably is made, as described in my said application, in two parts or sections, which are made separable horizontally for the purpose of releasing the arbors or for the purpose of extending the sections. The outer wings b b' of the said base-piece or frame serve as supports for the centers or arbors.

The two parts of the holder when in use are bolted together by the bolts b^2, and the holder is adapted to be attached to the bed of the milling-machine by the connections or bolts b^3.

C represents the arbors, and they are illustrated with a number of blanks mounted upon them.

c represents the centers carried upon the support b of the holder, and each of which is horizontally adjustable by means of a thumb-nut c', having a recess c^2, which receives a yoke c^3, extending down from the outer end of the center, and which thumb-nut turns upon the threaded rod c^4, extending outwardly from the support b, to which it is rigidly secured. The arbors C may extend upon their ends c^5 through the support b' and carry the adjusting worm-wheels c^6, to which reference will hereinafter be made; or there may be arranged centers c^7 in the support b' for receiving them. I prefer the last-named construction, and such centers are represented in Fig. 5. Each center is secured to a short shaft c^8, which extends through the support b' and carries a worm-wheel c^6.

The holder is provided with as many centers c c^7 as may be desired. The one represented in the figures of the drawings has four centers on each side, and is adapted to support four arbors.

To rotate or turn the arbors for the purpose of adjusting the blanks carried thereby in relation to the milling-tool accurately, I have used the worm-wheel c^6, and have arranged to turn them simultaneously by means of a worm c^9, which extends below the worm-wheels c^6, which are arranged upon the same line, and which has a bearing in the boxes or supports c^{10} c^{11}. (See Figs. 2 and 4.) There is also connected with the worm a pointer or indicator c^{16}, (see Figs. 2 and 4,) which is attached to a short stud or shaft c^{12}, carrying a worm-wheel c^{13}, (see Figs. 3 and 5,) and this pointer is held stationary. The worm-wheel c^{13} is connected with a dial or indicator-plate c^{14}, and upon the turning of the worm c^9 by a wrench or any other suitable device applied to its end c^{15} the dial is turned or moved in relation to the indicator or pointer c^{16}, and the extent of movement of each of the four arbors is at once apparent. By this construction I am enabled to simultaneously set all the arbors and lock them in position, to provide them with very fine adjustments or movements, and to set them in any desired relation to the milling-tool, and to always know what that relation is by an inspection of the dial.

It is desirable for certain kinds of work to change the position of the arbors from a hori-

zontal to an inclined one, and I have shown the supports b b' for the centers c c^7 as provided with movements or means by which they may be turned to any desired position upon a vertical arc of which some point below the centers c c^7 shall be the center, and I have represented as one means of providing them with this movement the construction represented in Figs. 4, 5, and 6, where each of the supports b b' is adjustable or movable upon a vertical arc of which the center is the shaft or pin D for the support b and the shaft or pin D′ for the support b'. The mechanism for moving or adjusting each of these supports is practically the same, and comprises the worm-shafts D D′, as above specified. Each shaft is rigidly secured to its support, and each shaft also has bearings in the base-piece of the work or blank holder, so that it is in effect a hinge-pin for the worm-wheels d upon it. These worm-wheels are engaged by the worms d'. (See Figs. 4, 5, and 6.) The worms are supported in suitable bearings, and carry at their outer ends the gear-wheels d^2, which are connected with each other by an intermediate large gear d^3, which is adapted to be turned by a wrench or any other desired way to turn the worms, and the turning of the worms d', which, if two are used, as represented in Fig. 4, are turned simultaneously by the connecting-gear d^2, one or both supports, according as one or both are acted upon, are caused to be moved from a perpendicular to a more or less inclined position, and to be held rigidly locked in such position, thereby moving the centers c c^7, or either of them, from a horizontal to a more or less inclined position, and the extent of the inclination of course is varied by the extent of adjustment or movement of the supports b b', and as the supports b b' may be turned in either direction from a perpendicular position the arbors may be inclined from either end.

In Fig. 10 I represent a movable arbor adapted to be supported by a center at one end, and having a long tapering spindle, which enters a tapering hole in a shaft c^8 at the other end. In Fig. 11 I represent the arbor as supported only by a center and by a coupling-sleeve, which extends upon the shaft c^8, and also upon the arbor, and to which it is locked by a number of set-screws.

As the position of the holder must be varied in relation to the bed A of the machine for milling certain kinds of work, and also for the purpose of turning the holder a quarter-revolution to bring the arbors and the blocks or tool-blanks which they carry in different relation to the milling-tool without removing the holder from the bed of the milling-machine, I have formed in the base-piece of the holder the curved slots E E′, which receive the bolts by which the holder is locked to the bed of the milling-machine, and I arrange beneath the holder a plate or block e, having an outward extension or foot e', which enters a recess in the bed of the milling-machine. Upon this I mount a block e^2, which is adapted to be turned or rotated thereon upon the post e^3, extending upward from this block e, and there is formed in the upper surface of this block e^2 a recess e^3, which receives a projection or centering-foot e^4, extending downward from the holder B. The plate or block e^2 has curved slots corresponding to the slots E E′, and the centering-pin e^3 may extend upward sufficiently to enter a hole in the holder, in order that the two blocks and the holder may register. To rotate the holder it is simply necessary to release the holding-bolts sufficiently to permit the block or plate e^2 to be turned upon the block or plate e, and when the holder has been turned or moved to its new position the bolts are again locked.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

1. The combination, in a work-holder, of a base piece or frame having supports, an arbor sustained by said supports and having a worm-wheel c^6, a worm c^9, an independent worm-wheel c^{13}, a rotary dial connected with the last-named worm-wheel, and a stationary index co-operating with said dial.

2. The combination, in a work-holder, of a base piece or frame B, having an adjustable support hinged thereto above the bottom of said base-piece, a worm-wheel d, rigid with said hinged support, and a worm d', journaled in the said base-piece and engaging said worm, whereby by turning said worm the said support may be adjusted to different angular positions.

3. The combination, in a work-holder, of the base piece or frame having the supports b b', provided with the centers c c^7, and the arbor carried by said supports, both of the latter being adjustable from a vertical position to vary the angle of the said arbor, substantially as set forth.

4. The combination, in a work-holder, of a support, one or more centers mounted thereon, the worm-wheels rigidly secured thereto, the said support being hinged to a base-piece, the worms d', carried by said base-piece, the gear-wheels d^2, and a common actuating-gear d^3, substantially as described.

5. The combination, in a work-holder, of a support b, one or more centers c, carried thereby, the said support being hinged to a base-piece, the support b', supporting one or more centers c^7, hinged to a base-piece and movable from a perpendicular position, devices for moving said supports b b' from a vertical to an inclined position, and for locking them in such position, the arbors carried by said center, and devices for turning and locking said arbors, substantially as described.

6. The combination of the support b', a base-piece to which said support is hinged, and devices for moving said support from a perpendicular to an inclined position and for

holding it in such position, the centers c^7, carried thereby, the worm-wheels c^6, the worm c^9, the worm c^{13}, the indicator c^{11}, and dial c^{14}, carried by said movable support b', with the support b, hinged to a block or base-piece and movable from a perpendicular to an inclined position, and supporting one or more centers c, substantially as described.

7. The combination, in a work-holder, of the supports b b', carrying one or more centers c c^7, and the base-piece B, having the slots E E′, with the block e, having the extension or foot e', and the intermediate block e^2, connected with the holder, and having slots corresponding to the slots E E′, and the bolts or clamps connecting the holder with the bed of the milling-machine, substantially as described.

CHARLES H. TRASK.

In presence of—
F. F. RAYMOND, 2d,
J. M. DOLAN.