A. L. DE LEEUW.

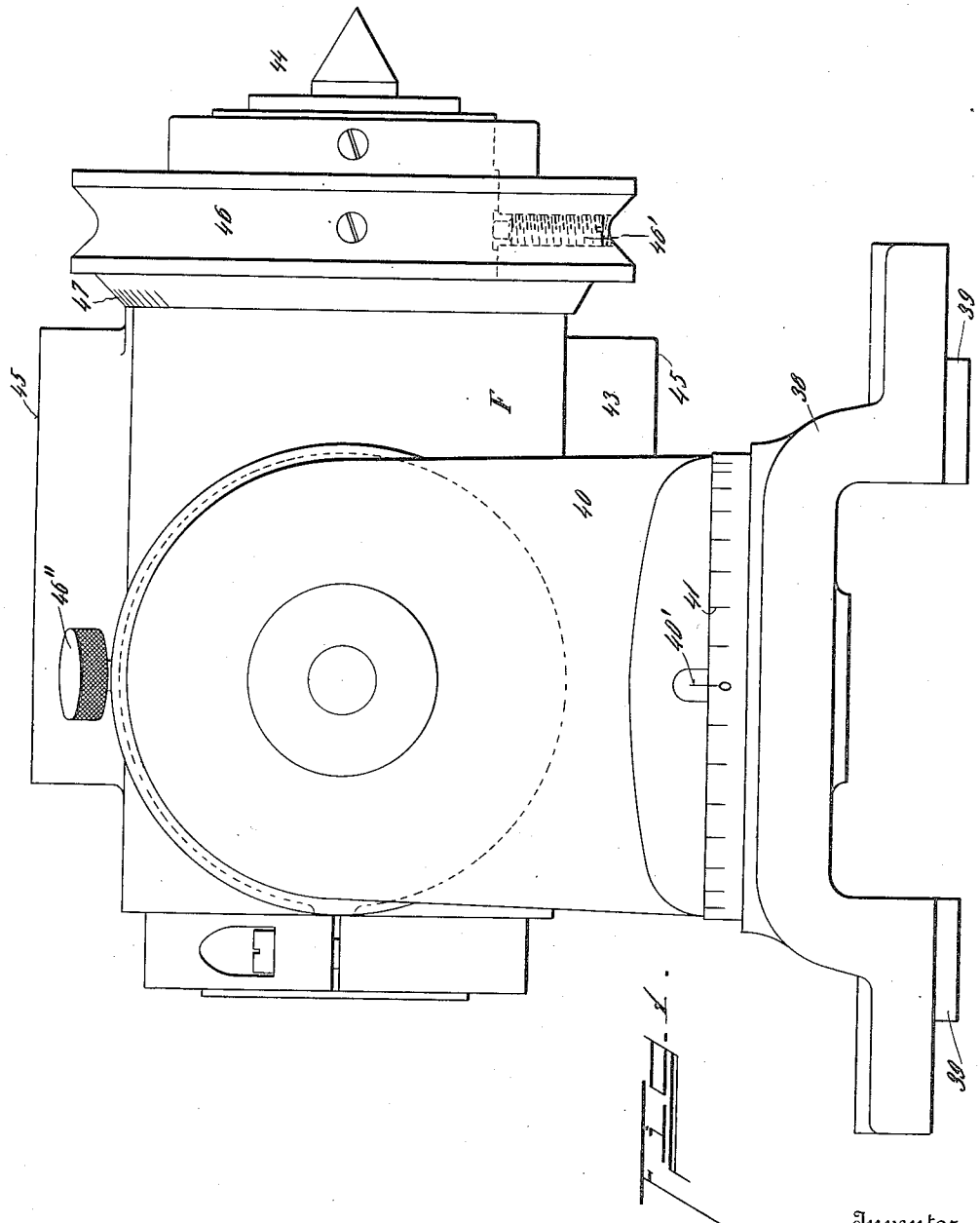
CUTTER SETTING DIAL.

APPLICATION FILED MAY 27, 1913.

1,075,285.

Patented Oct. 7, 1913.

3 SHEETS—SHEET 1.



Witnesses

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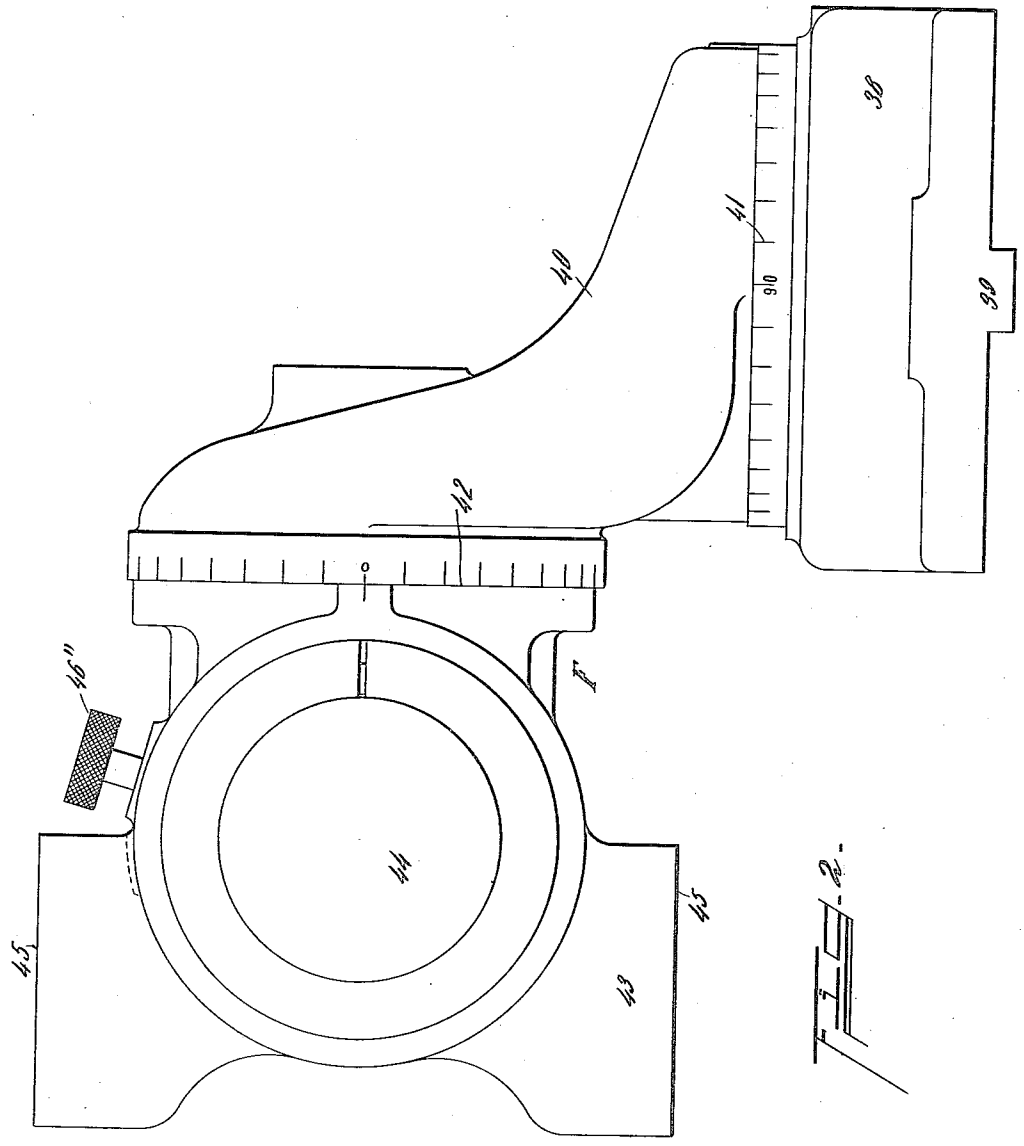
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3 SHEETS—SHEET 3.

Fig. 3.

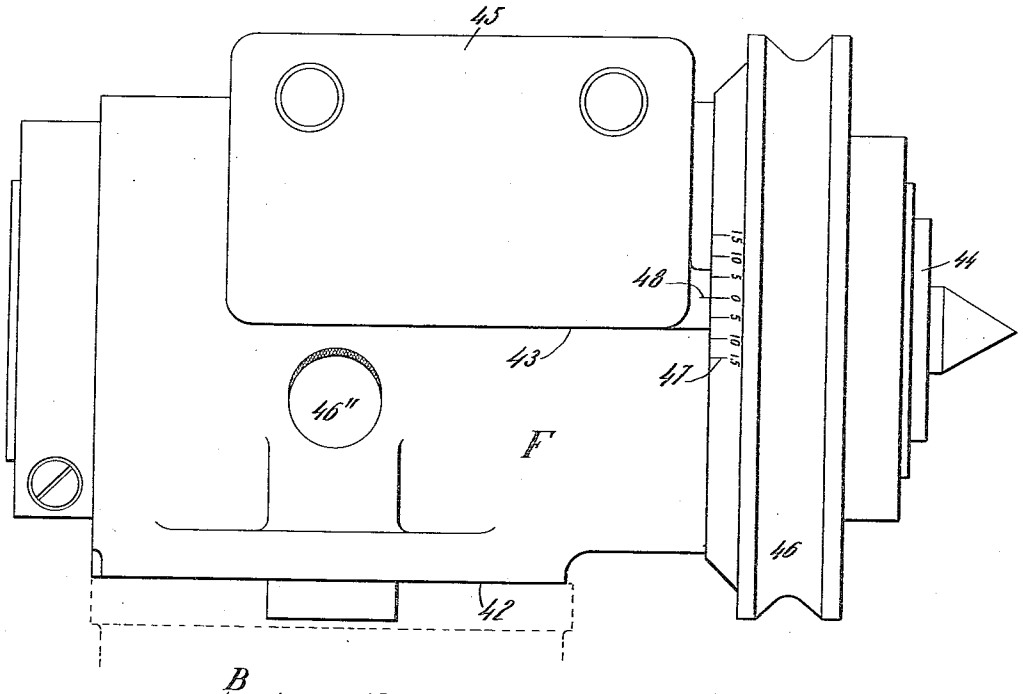
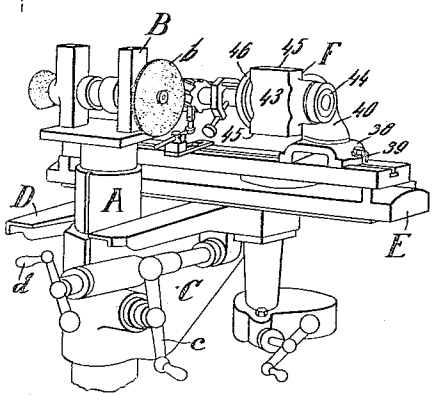


Fig. 4.



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UNITED STATES PATENT OFFICE.

ADOLPH L. DE LEEUW, OF CINCINNATI, OHIO, ASSIGNOR TO THE CINCINNATI MILLING MACHINE COMPANY, OF CINCINNATI, OHIO, A CORPORATION OF OHIO.

CUTTER-SETTING DIAL.

1,075,285. Specification of Letters Patent. Patented Oct. 7, 1913.

Application filed May 27, 1913. Serial No. 770,171.

To all whom it may concern:

Be it known that I, ADOLPH L. DE LEEUW, a citizen of the United States, and residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and Improved Cutter-Setting Dial, of which the following specification is a full disclosure.

This invention deals with means instrumental in positioning a toothed cutter in such relation with a grinding wheel that the peripheral edges of its teeth may be ground off to sharpen the same while providing the correct cutting angle.

In such attachments as have heretofore been proposed it has been a matter of some manipulative difficulty to position the cutter in such exact relation with the grinding wheel that the proper clearance angle may be easily and accurately obtained. By following clearance tables after the manner indicated by various diagrams, such relation has been secured by skilful operators, but such adjustment is always annoying and tends to result in work of an impaired quality.

The primary object of this invention is to provide a structure for grinding cutters that will at once be simple in design, inexpensive in production and very convenient in point of use, and which will enable the attendant to easily sharpen cutters and immediately obtain the correct amount of clearance.

Other objects will be in part obvious from the annexed drawings and in part indicated in connection therewith by the following analysis of this invention.

This invention accordingly consists in the features of construction, combination of parts and in the unique relations of the members and in the relative proportioning and disposition thereof; all as more completely outlined herein.

To enable others skilled in the art so fully to comprehend the underlying features thereof that they may embody the same by the numerous modifications in structure and relation contemplated by this invention, drawings depicting a preferred form have been annexed as a part of this disclosure, and in such drawings, like characters of reference denote corresponding parts throughout all the views, of which:—

Figure 1 is a side elevation of a swivel head constructed in accordance with this invention. Fig. 2 is an end elevation of the head looking toward the same from the rear, *i. e.*, in the direction of the center. Fig. 3 is a top plan of said head showing the graduations on the pulley. Fig. 4 is a general view indicating this head in its relation with its coördinating elements, *i. e.*, a grinding wheel, a table, a table adjusting means, an arbor, and a tooth rest.

Continuing now by way of a more detailed description, it may be noted that this application sets forth but does not claim certain matter reserved for my other application, Serial No. 770,494, filed May 28, 1913, wherein I have fully revealed various combinations and subcombinations pertaining to a grinder organization. The subject matter of this case deals more especially with the proposition of facilitating the sharpening of ordinary milling cutters so as to provide the clearance angle that will be most efficient.

It is further noteworthy that while reference is herein made to a device in the nature of an attachment, its capacities are functional with elements of the machine to which it is applied, and this invention therefore more especially contemplates an organized machine of which this device is a component part since the feature of removability is subordinate to its real office.

As exemplifying a general organization with which the parts more especially noticed herein may be combined, reference will be made to a grinder structure. This comprises a column A surmounted by a head B in which is journaled the spindle of the grinding wheel *b*. A table is adjustably supported by the column A in such a way that it may be brought into any desired relation with the grinding wheel, and to that end, a knee C is mounted on the column A, and is vertically adjustable by means of the hand wheel *c*. A saddle D may be moved transversely to the column A by means of a hand-wheel *d*. A table E is mounted on the member D and is movable transversely by means of the lever *e*. By this instrumentality the table E may be adjusted in any way in relation to the grinding wheel *b*, as will be understood by referring to my said copending application.

The head-stock F comprises a base 38 having alining lugs 39 and adapted to be secured in any desired longitudinal position on the table by means of bolts entering the slots in the latter. An angle block 40 is piv-

otally supported upon the base 38 and provides an index point 40′ adapted to coöperate with graduations 41 on the base so that it may be brought into any predetermined angular relation with the base. At right angles to the plane of the supporting bearing face of the angle block 40 is a second face 42 upon which pivotally rests a head 43 in which is journaled a spindle 44 which supports the work on centers or by means of collet-chucks or otherwise. This head 43 preferably provides seats 45 to which the universal tooth rest may be secured in the same manner as in the case of the head supporting the spindle of the grinding wheel. A pulley 46, by means of a small screw 46′ projecting from its periphery into engagement with the spindle 44, may be caused to be locked to said spindle, but when it is desired to rotate work about a dead center, the pulley may be released and the spindle locked by the thumb screw 46″. Either on this pulley or on an integral portion of the spindle 44 are graduations 47 coöperating with a corresponding indicator line 48 on the head 43 so that the spindle or the work positioned by the pulley 46 may be rotated through a definite angle. These graduations are preferably arranged on the pulley, however, since by means of suitable clamps or dogs 49 the work may be mounted on dead centers and turned through a definite angle without requiring rotation of the spindle 44. The office of this graduated spindle or actuating pulley is to serve as a means instrumental in greatly reducing the time and difficulty required for sharpening the peripheral edges of the teeth of a cutter to secure the correct clearance angle. To accomplish this by the herein disclosed mechanism, it is exceedingly simple, since it is only necessary first to bring the radius line passing through a peripheral tip of one tooth into a position horizontally at right angles with the grinding surface of the wheel, then rotate the work exactly through the clearance angle required, which may be directly determined by the graduations, then adjust the tooth rest on the table to maintain this position for each tooth in succession, and then feed the cutter in the usual manner in relation with the grinding wheel. The correct grinding angle will then be secured.

Without further elaboration, the foregoing will so fully reveal the gist of this invention that others can by applying current knowledge readily adapt it for various applications without omitting certain features that, from the standpoint of the prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention, and therefore such adaptations should and are intended to be comprehended within the meaning and range of equivalency of the following claims.

Having thus revealed my invention, I claim as new and desire to secure by Letters Patent of the United States:—

1. A mechanism of the nature disclosed combining a table, a base member mounted on said table, a head vertically pivoted to said base member, a head-spindle horizontally journaled in said head, a dial provided by said spindle and providing graduations adapted to be registered with an indicator on said head to enable said spindle to be definitely rotated through the exact clearance angle desired for a cutter, means for chucking a cutter on said spindle, a grinding wheel, means for moving said table to bring the grinding surface of said wheel at right angles to a line passing through the axis of said spindle and through the peripheral cutting edge of one of the teeth of said cutter, and a tooth-rest adapted to be adjustably positioned to maintain between each tooth in succession and said table the relation predetermined by means of said dial.

2. A mechanism of the nature disclosed combining a grinding wheel, a table, an arbor rotatably supported on said table and adapted initially to carry a cutter in such relation to the grinding surface of said wheel that a line passing through the axis of said arbor and through the tip of the peripheral edge of a tooth will be perpendicular to the adjacent grinding surface, a head-stock, an arbor-supporting member rotatably mounted in said head-stock, graduations between said member and said head-stock adapted to enable the arbor and cutter to be turned directly through a predetermined clearance angle, a tooth-rest adjustable into a definite relation with said table adapted to maintain the aforesaid relation between said tooth and table, and means for moving said table vertically longitudinally and transversely with relation to said grinding surface.

In witness whereof, I hereunto subscribe my name, as attested by the two subscribing witnesses.

ADOLPH L. DE LEEUW.

Witnesses.
ALBERT F. NATHAN,
OLIVER B. KAISER.