July 21, 1925. 1,546,538

A. FISHER

AUTOMATIC ELECTRIC PENCIL SHARPENER

Filed Jan. 2, 1925 2 Sheets-Sheet 1

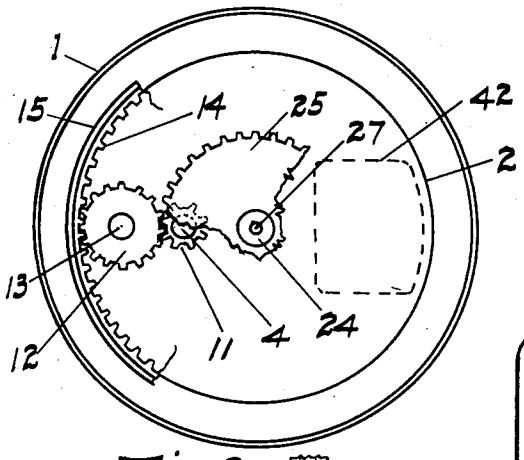


Fig 2

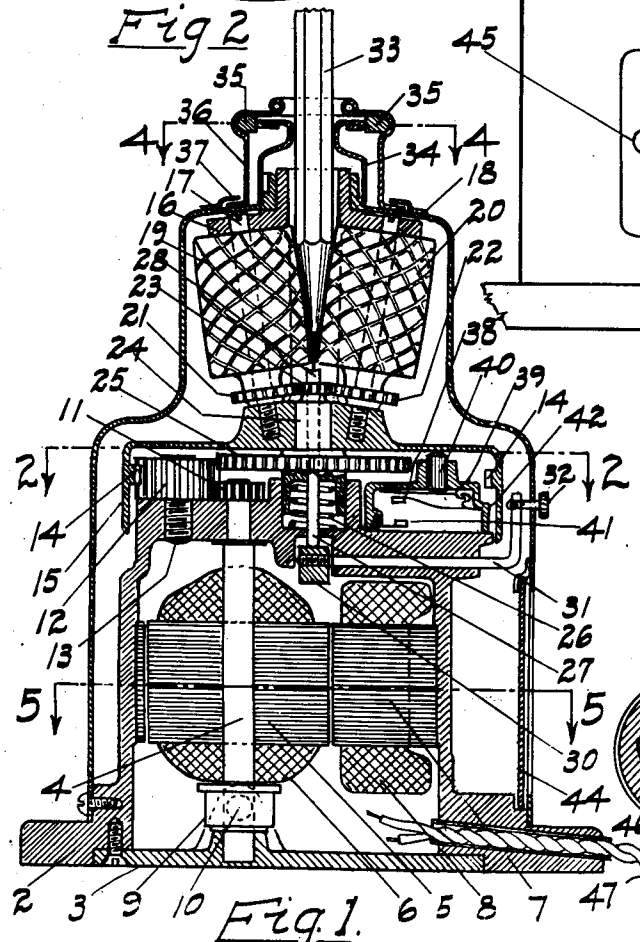


Fig. 1.

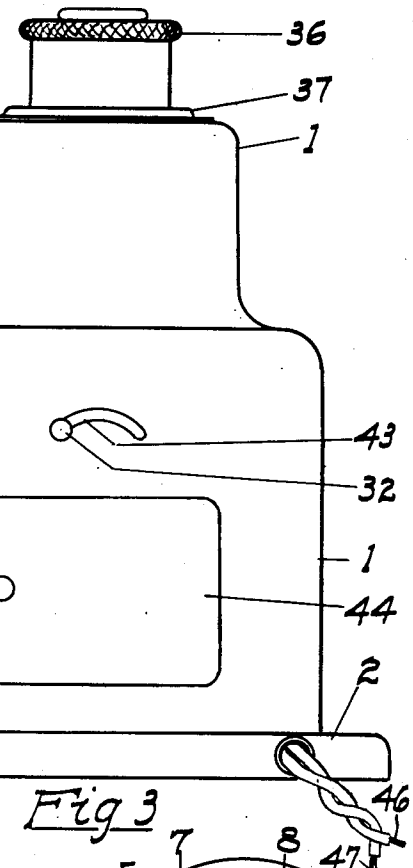


Fig 3

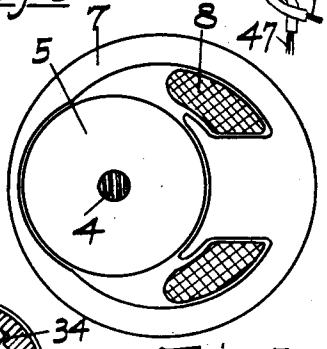


Fig. 5.

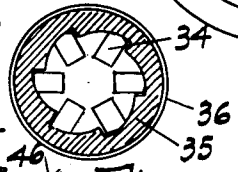


Fig 4

INVENTOR.

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July 21, 1925. 1,546,538

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AUTOMATIC ELECTRIC PENCIL SHARPENER

Filed Jan. 2, 1925 2 Sheets-Sheet 2

Fig. 6

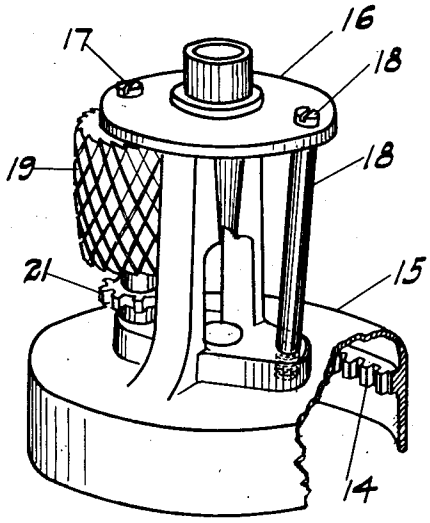


Fig 8

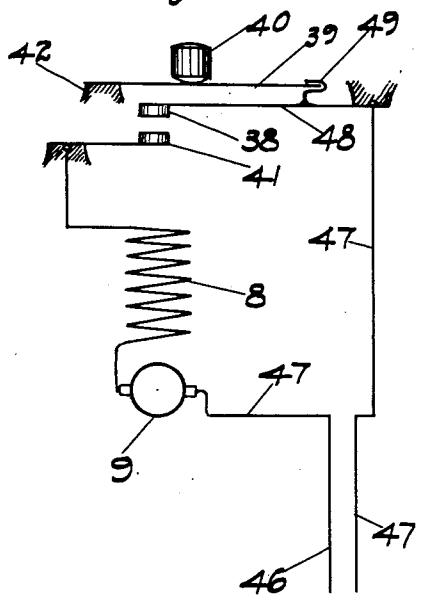
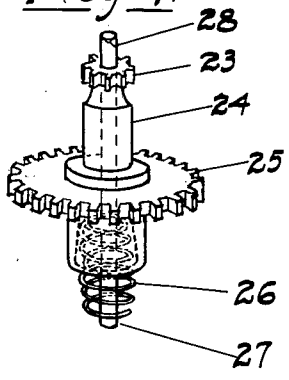


Fig. 7.



INVENTOR

Andrew Fisher

Patented July 21, 1925. 1,546,538

UNITED STATES PATENT OFFICE.

ANDREW FISHER, OF LOS ANGELES, CALIFORNIA.

AUTOMATIC ELECTRIC PENCIL SHARPENER.

Application filed January 2, 1925. Serial No. 268.

To all whom it may concern:

Be it known that I, ANDREW FISHER, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented certain new and useful Improvements in Automatic Electric Pencil Sharpeners, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to certain new and useful improvements in automatic electrically controlled pencil sharpeners and has for its principal object to provide a device of this character which embodies novel features of construction whereby pencils of various sizes can be instantaneously sharpened by inserting a pencil in the adjustable opening and gently pushing downwardly therein the result being automatically obtained, without the use of manually operated handles or other mechanisms.

Another object of the invention is to provide an efficient form of stopping device, automatically operated when the satisfactory completion of the pointing of the pencil has been accomplished.

A still further object is the attainment of a graduated sized opening for the insertion and grip of different sized pencils insuring proper alignment with the cutting elements and producing a uniformly projecting lead on the pencil.

Further objects and advantages will appear in the course of the following description and accompanying drawings in which—

Fig. 1 is a vertical longitudinal sectional view of the pencil sharpener constructed in accordance with the invention.

Fig. 2 is a horizontal sectional view on the line 2—2 of Fig. 1.

Fig. 3 is a front elevation, showing the clean out door and a graduated means for regulating the cutting of different lengths and sizes of leads.

Fig. 4 is a horizontal section on the line 4—4 of Fig. 1 thru the adjustable pencil bushing, which aligns and grips pencils of different sizes with the cutting elements.

Fig. 5 is a horizontal section on the plane of the line 5—5 of Fig. 1, showing the electrical driving motor and field wiring.

Fig. 6 is a perspective view of the rotary shield.

Fig. 7 is a perspective view of the center gear shaft showing an apertured opening containing a pencil stop plunger.

Fig. 8 shows a wiring diagram.

Referring more particularly to the form of the invention shown in Figures 1 to 8 inclusively of the drawings, it will be seen that the device embodying my improved features of construction consists of an inner motor housing 2 and an outer casing 1 which on account of the latter acting as a receptacle for cuttings and the necessity of removing the same from time to time for cleaning purposes, two separate compartments are arranged for each of the driving and cutting elements.

A bottom plate 3 is fastened to a motor housing 2, enclosing the same and having an inwardly projecting flange which serves as a thrust bearing for the lower end of the armature shaft 4 which is the main driving axis of revolution; the upper end of armature shaft 4 being journaled in the top portion of the motor housing in a plane perpendicular to the axis of revolution.

Upon the armature shaft 4 and within the motor housing 2 is surmounted the armature of any desired type consisting of armature laminations 5 and armature wiring 6 together with the commutator 9 adapted to engage a brush element 10. Surrounding the armature laminations 5 and in suitable relation thereto is a laminated field core 7, which is pressed or fastened into the motor housing 2 and which carries a field coil 8.

On the extending portion of the armature shaft 4 journaled into the motor housing 3 and projecting inwardly there-through is mounted a pinion gear 11 which meshes with an intermediate gear 12, rotatable on stud 13 rigidly fastened to the motor housing 2.

The intermediate gear 12 drives an internal gear 14 circumferentially located within the rotatable shield 15 which is constructed to envelop that portion of the driving mechanism assembled just above and without the motor housing in order to protect the driving elements from the shavings and dust particles, which are rasped off the pencil 33 during the process of sharpening.

Between the upper portion 16 and lower portion 15 of the rotating shield are mounted for rotation two barrel shaped rasps 19 and 20, each revolvable about their respective axes 17 and 18 and which are slightly

inclined to a plane perpendicular to the motor axis of revolution.

Integral with each rotating rasp 19 and 20 are gears 21 and 22 which mesh with a gear 23 machined into the upper extruding portion of the center gear shaft 24 journaled into the rotatable shield, upon which is mounted the main driving gear 25, the enlarged lower portion of this shaft being carried in a cup shaped bearing machined into the top portion of the motor housing. Within the lower portion of center gear shaft 24 is a cavitated receptacle for housing a compression spring 26, which forces the cutting elements back into their normal position of rest, after the sharpening of the pencil has been accomplished there being allotted a slight amount of travel between the lower part of the main driving shaft 24 and top portion of the motor housing for obtaining this result.

Within the centrally apertured opening of the main driving shaft 24 and axially therewith is mounted a pencil stop plunger 27, having a slightly concave end 28 and adjustable from the outside of outer casing by a knurled knob 32 operable in a crescent shaped slot 43 and fastened to a cam shaft 31, which is journaled within the motor housing 2 and terminating within the eccentric 30. The pencil stop plunger is interposed thereupon and the length of the pencil point to be obtained is governable by setting the knurled knob 32 in its graduated slot before pointing process is started. Chambered within the top portion of the outer casing 1 and fastened thereto by a flange 37 are a number of shiftable metal grips 34 positioned diametrically opposite each other inside a rotary cam disc 35 which serves the two fold purpose of gripping and aligning the pencil with the cutting elements and are operable in a plane perpendicular to the cutting axes of rotation by adjusting an annular ring 36 forming a part thereof.

The automatic starting and stopping of my improved device is accomplished by the energizing of the cutting elements from a switch contact 38 in Fig. 8 contained within a switch bearing 42 fastened on the top of the motor housing 2 in which wires 46 and 47 preferably of a cord type transmit the electric current which passes through the commutator 9 of the electric motor, through the motor field coil 8 and further through contact points 41 and 38 when closed. The spring leaf 48 and wire 47 constitute the return circuit.

The movement of knob 40 in the switch housing is only very short, whereas the motion of contact points 38 and 41 should be preferably of ample dimension to disrupt the electric arc appearing between them at the time of interruption. For this purpose spring leaf 39 transmits and increases the motion of spring leaf 48 and contact point 39, by engagement with the link member 49. A clean out door 44, adjustable with a thumb screw 45 is arranged to open and close by sliding sidewise within the outer casing 1 for cleaning the inner compartment of shavings and dust particles rasped off during the process of sharpening.

A pencil sharpener embodying the general principles as herein set forth has been assembled and constructed and has proven an efficient device for sharpening pencils of the various sizes as described.

The switch contacts for automatic starting the motor, the rapid rotation of the motor and cutting elements, the adjustable pointing and automatic stopping arrangement, the general configuration of the cutting rasps, and the assemblage of all the parts in general are salient features for which the applicant desires to secure Letters Patent as covered in the following claims appended hereunto:

I claim:

1. In an automatic electric pencil sharpener of the class described, the combination of an outer casing and an inner motor housing, comprising a bottom cover plate, formed with an opening to receive a shaft rotatably mounted thereon, means for rotating said shaft, a pinion secured to said shaft and rotating therewith, and adapted to engage an idler gear, suitably mounted to said motor housing, the said idler gear meshing with an enveloping shield revolvable upon a center gear shaft, journaled into the top portion of aforementioned motor housing and a pair of cutting rasps each revolvable upon their own axis of support and orbital in relation to the second mentioned shaft and meshing therewith, conjunctly connected to first mentioned idler gear, by having and supporting a main driving gear interposed between revolving shield and top of motor housing engageable therewith for the purpose described.

2. In an automatic electric pencil sharpener of the class described the combination of an outer casing and an inner motor housing, a revolvable shield rotatable upon an axis supported by said motor housing, a pair of cutting rasps surmounted upon said revolvable shield and rotatable therewith, a means to rotate each said rasp upon its own axis slightly inclined to the perpendicular axis of revolution, a compression spring to force above mentioned rotatable shield and cutting rasps against pencil during the sharpening thereof, the same being automatically stopped by pencil stop plunger apertured within a central gear shaft which is journaled into the top portion of motor housing and operable from the outside of first mentioned casing.

3. In an automatic electric pencil sharp-

ener of the class described the combination of an outer casing and an inner motor housing containing an armature and field wiring adapted to be energized for the rotation of a pinion gear mounted on an armature shaft engaging an idler gear adapted to rotate an enveloping shield, the said idler gear meshing with a main driving gear mounted upon a central shaft, journaled within aforementioned motor housing, the same supporting and driving a pair of cutting rasps surmounted upon an enveloping shield and adapted to be rotated upon their own axis by an integral gear mounted thereon and therewith engaging a smaller gear upon the projecting portion of center gear shaft apertured to receive a pencil stop plunger operable from the outside of first mentioned casing and terminating within a cam for regulating the cutting of different length leads, the same being automatically tripped by a switch contact contained within the top portion of motor housing.

4. In an automatic electric pencil sharpener of the class described the combination of an outer casing and an inner motor housing comprising a rotatable enveloping shield adapted to be pushed downwardly, making contact with a switch element whereby to rotate said shield and a compression spring seated with the top of inner motor housing to force the aforesaid enveloping shield to its normal position of rest, thereby disrupting the switch contact.

5. In an automatic electric pencil sharpener of the class described the combination of an outer casing and an inner motor housing comprising a bottom cover plate formed with an opening to receive a shaft, rotatably mounted thereon, means for rotating said shaft, a pinion secured to said shaft and rotating therewith, engaging an idler gear and meshing therewith, the said idler gear engaging a second gear mounted upon a center shaft journaled into an enveloping shield and an internal gear circumferentially located in the rim of said enveloping shield, whereby to rotate enveloping shield about said center shaft as an axis, the upper portion of aforementioned revolving shield having mounted for rotation therein two cutting rasps having their individual axes slightly inclined to the main axis of revolution and adapted to engage a driving gear mounted upon the extruding portion of center gear shaft to rotate said rasps, a pencil point plunger apertured within aforementioned center gear shaft and actuated by a cam operable from outside of outer casing in lengthening and shortening pencil points in the sharpening thereof and a make and break switch to automatically start said combination upon insertion of pencil in adjustable opening and the automatic stopping of the device after pencil is sharpened.

6. In an automatic electric pencil sharpener the combination of an outer casing and inner motor housing and a revolvable enveloping shield supported thereon and extending vertically therefrom, having a center shaft mounted for support axially therewith, the lower hollow portion being journaled in the top of motor housing containing a compression spring adapted to project inwardly through rotatable shield during process of rotation and finally to disrupt the switch connection after same has made contact.

Signed at Los Angeles, in the county of Los Angeles and State of California, this 24th day of December, A. D. 1924.

ANDREW FISHER.

Witnesses:
E. WESSELKEAIER,
HESTER O'DONNELL.