

E. P. WEBSTER.  
PENCIL SHARPENING MACHINE.  
APPLICATION FILED APR. 14, 1911.

1,018,536.

Patented Feb. 27, 1912.

2 SHEETS—SHEET 1.

Fig. 1.

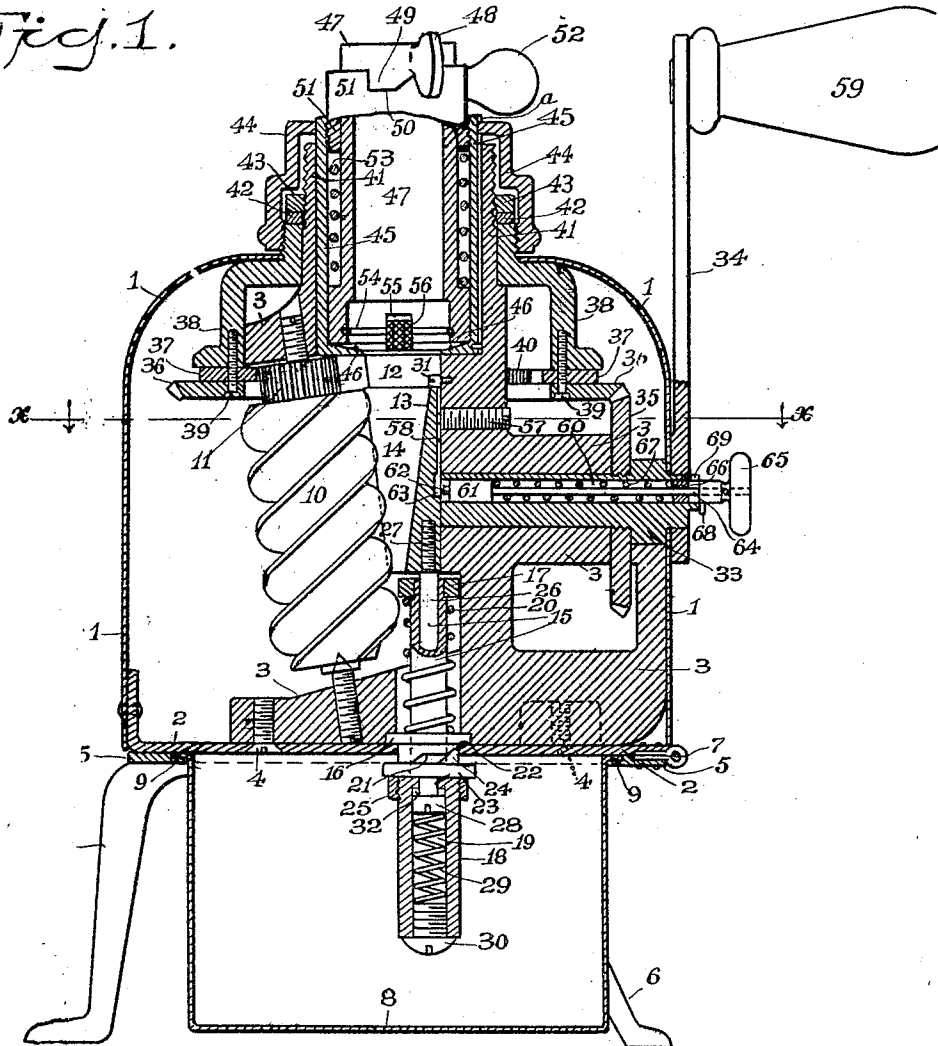
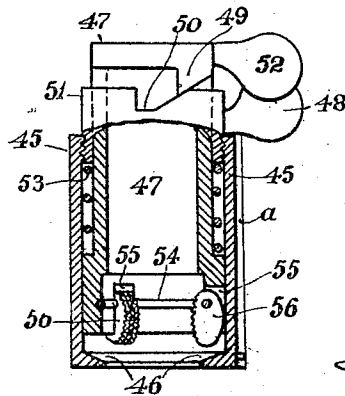


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

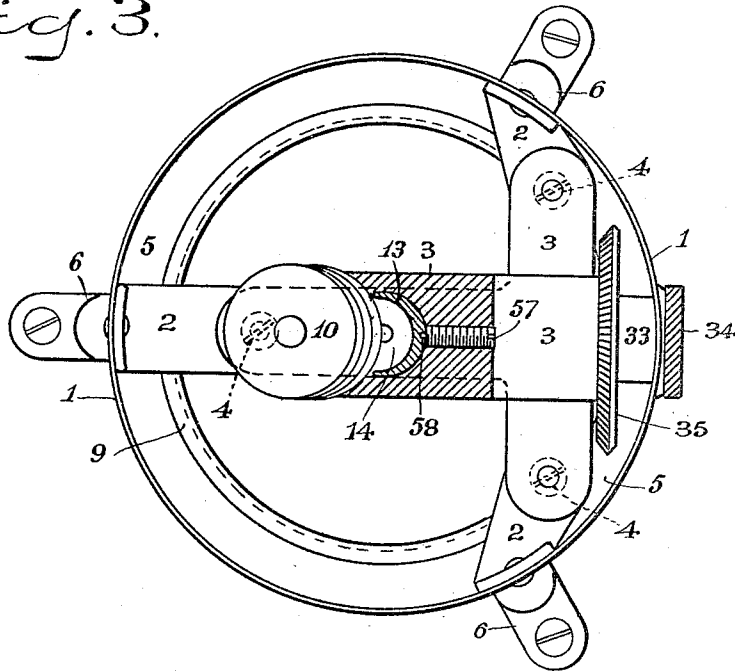
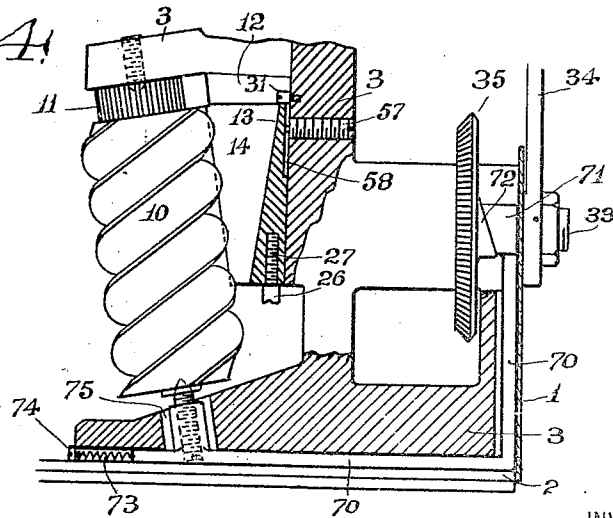


Fig. 4.



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# UNITED STATES PATENT OFFICE.

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PENCIL-SHARPENING MACHINE.

1,018,536.

Specification of Letters Patent.

Patented Feb. 27, 1912.

Application filed April 14, 1911. Serial No. 621,075.

*To all whom it may concern:*

Be it known that I, EDGAR P. WEBSTER, a citizen of the United States, residing in the city of Bridgeport, county of Fairfield, State of Connecticut, have invented certain new and useful Improvements in Pencil-Sharpener Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable other skilled in the art to which it appertains to make and use the same.

My invention relates to certain new and useful improvements in pencil sharpening machines, and has for its object to provide a machine of this description in which the pencil and the cutter shall be revolved continuously in the same direction so that at their points of contact said pencil and cutter will be traveling in opposite directions, while at the same time, by proper adjustments, a variable length of sharpened surface on the pencil may be obtained, a further object of my invention being to hold the pencil in a novel manner so that it may be automatically fed by gravity to the sharpening device, irrespective of any means employed for determining the nature of the pencil point.

With these ends in view my invention consists in certain details of construction and combination of parts such as will be hereinafter more fully described and then particularly pointed out in the claims which conclude this description.

In the accompanying drawing Figure 1 is a sectional elevation of my improved machine, Fig. 2 a detail sectional elevation of the pencil clamping mechanism, Fig. 3 a section at the line  $x, x$ , of Fig. 1, and Fig. 4 a detail broken sectional elevation of a modification of my improvement.

Similar numerals of reference denote like parts in the several figures of the drawing.

1 is any suitable casing to inclose the parts of my improvement, and 2 are horizontally disposed bottom plates secured to said casing. 3 is the frame of the machine, preferably of cast metal, and secured to said plates by means of screws 4. 5 is a horizontally disposed annulus upon which said plates 2 normally rest said annulus having secured thereto and depending therefrom suitable legs 6. The upper structure, composed of the casing 1 and plates 2, is hinged

to the annulus 5 at 7, and the inner upper surface of said annulus is counter-bored and a bottom cup 8 assembled therein so as to be readily removable therefrom in any ordinary manner, said cup being formed with a laterally extending flange 9 which fits within said counter-bored portion so as to be flush with the upper surface of said annulus.

Journaled within the frame 3 in angular disposition is a cutter roll 10 which carries a pinion 11 at its upper extremity, and located within a vertical opening 12 in the frame 3 is a pencil bushing 13 which is capable of vertical movements within said opening, within prescribed limits, as will be hereinafter more fully described. This bushing is formed with a downwardly tapering opening 14 extending from top to bottom, and said bushing is cut away at one side so as to admit the cutter roll 10 in juxtaposition within said opening, so that it will be clearly understood that a pencil introduced down through this opening 14 would be within the field of operation of the cutter roll.

15 is a gage pin passed upwardly and loosely through a thimble 16 held absolutely stationary between one of the plates 2 and the frame 3, the upper end of said pin having secured thereto a head 17 in proximity to the lower end of the bushing 13, while the lower extremity of said pin is enlarged as seen at 18 and is provided with an enlarged or counter-bored portion 19 which leads within the interior of the upper portion of said pin. Around the upper portion of the pin 15 and confined between the thimble 16 and head 17 is a coil spring 20 whose function is to normally elevate said pin.

The lower edge of the thimble 16 has formed therein notches 21, 22, the latter of which is deeper than the former, and around the pin 15 and immediately backed by the upper edge of the enlarged part 18 is a collar 23 that is secured to said pin as to rotation and is provided with a tooth 24 extending upwardly therefrom and adapted to cooperate with the notches 21, 22, in the manner presently to be explained. Immediately beneath this collar 23 and engaging a threaded part of the enlarged portion 19 is a nut 25, and extending loosely through the smaller

opening in the pin 15 is a screw bolt 26 whose upper extremity 27 is threaded and driven within the pencil bushing 13, the lower end of this bolt being provided with a head 28 which is contained within the counter-bore 19. In assembling the machine this screw bolt 26 with its head against the upper wall of the counter bored portion 19 is turned or driven until the bushing 13 is drawn downwardly to a plane where the cutter roll will be effective in operating against a pencil contained within said bushing, and this adjustment of the latter will be readily understood when it is borne in mind that the screw bolt itself can not advance because its head is in abutment against the inner wall of the counter bored portion 19.

By turning or driving the nut 25 on the enlarged portion 18 of the pin the latter will be drawn downwardly against the resiliency of the spring 20 thereby causing the head 17 to draw away from the bushing 13, and this adjustment is made in the assembling of the machine in order to fix the normal distance between said bushing and head, since, as will be hereinafter explained, the point of the pencil rests upon this head, and the greater the distance between the latter and said bushing the longer and sharper will the pencil point be fashioned by the cutter roll. This adjustment of the normal position of the head 17 with respect to the bushing 13 may be effected while the tooth 24 is within either the shallow notch 21 or deep notch 22, and, if said adjustment is made while said tooth is within the deep notch 22 this will be effected for the shortest or bluntest point on the pencil, whereas if said tooth is within the shallow notch 21 such adjustment will be for the longest or sharpest point. If this adjustment has been made while the tooth 24 is within the deeper notch 22, the operator, in the event that he desires a long point, merely grasps the part 18 and turns the pin until the tooth 24 has ridden into the shallow notch 21, thereby forcing the pin downwardly against the resiliency of the spring 20, and, as above described, withdrawing the head 17 at a greater distance from the bushing 13. This adjustment, by means of the nut 25 and screw bolt 26 are merely factory expedients and are utilized solely for the purpose of properly fixing normal conditions of the parts, since, in the sharpening of pencils, it is merely desired to obtain a sharp or blunt point and a long or sharp point, and these results are obtained by merely turning the pin bodily so as to cause the tooth 24 to cooperate with the notches 22 and 21.

In order to preserve the proper elevated position of the bushing 13 I employ a coil spring 29 which is housed within the counter-bore 19 and is confined by means of a

screw 30 driven within the end of the latter, and after this bushing has once been sufficiently depressed so as to be in the proper position for cooperating with the cutter roll 10 this position of said bushing is maintained by means of a stop 31 driven into the frame 3 immediately above the upper edge of the bushing. But, as a matter of fact, I prefer to adjust the gage pin with respect to the bushing when the tooth 24 is within the shallow notch 21 and this adjustment is of course made for the longest and sharpest point, and when the pin is turned to throw the tooth into the deeper notch 22 to elevate the pin, this will cause the inner wall of the counter-bore 19 to draw away from the head 28 so that there will be a space 32 between said wall and head, whereby when the tooth is shifted into the shallow notch the pin will be depressed without affecting the bolt 26 or the bushing 13. But, as above stated, these adjustments by means of the screw bolt 26 and nut 25 are mere manufacturing expedients for convenience in the proper assembly of the parts and have nothing whatever to do with the operation of my improved machine, and for all practical purposes, in cutting a round point on a pencil, the gage pin could be solid throughout its length and its adjustments effected precisely as above described, and the pencil bushing could be isolated from said pin or any part connected therewith, and the proper cutting plane of said bushing located by ordinary experiment and then fixed, as, for instance, by a pin or screw. The cutter and the pencil are rotated simultaneously and continuously so as to travel at their points of contact in reverse directions by means of the following instrumentalities which I will now describe.

Journaled within the frame 3 is a crank shaft 33 to whose outer extremity beyond the casing is fixed a crank 34, and carried by this shaft is a bevel gear 35 which meshes with a comparatively large annular-shaped bevel gear 36. 37 is an annulus resting upon the gear 36, and 38 is a hollow hub upon said annulus, and said gear, annulus, and hub are firmly secured together by means of screws 39, so that it will be clear that these three parts will all rotate in harmony. The inner periphery of the annulus 37 has spur teeth 40 which mesh with the pinion 11, and the hub 38 at its upper end is journaled around a reduced portion 41 of the frame, which portion is in the form of a vertically disposed socket and is exteriorly threaded at its upper end. Owing to the fact that the hub is journaled around a reduced portion of this part of the frame, said hub will be supported by the frame itself and will maintain the gear 36 and annulus 37 in proper horizontal position so that they will properly mesh with the gear 35 and pinion 11, and this hub is capable of

free revolution around said reduced portion. 42 is a leather or other washer encircling the reduced portion of the frame and resting upon the top of the hub 38 and confined by means of a nut 43 driven on the threaded portion of said frame against said washer sufficiently tight to keep the hub from jumping upwardly during operation but not so tight as to interfere with the free rotation of said hub. The upwardly projecting portion of this hub is exteriorly threaded, and an interiorly threaded cap 44 is secured thereto so as to revolve therewith. Contained within the socket portion of the reduced upwardly extending portion of the frame 41 is a loose sleeve 45 capable of free vertical and rotary movements within said socket and having its lower extremity extending inwardly and beveled as shown at 46, and 47 is a thimble whose lower portion is enlarged and fits loosely within the sleeve 45 so as to be capable of independent vertical and rotary movement therein, the upper end of which thimble is provided with a laterally extending finger lug 48 and a peripheral beveled tooth 49 which latter is adapted to engage with a beveled notch 50 formed within the upper edge of a ring 51 that loosely encircles the upper portion of the thimble 47 and is rigidly secured to the inner upper wall of the sleeve 45, said ring being likewise provided with a finger lug 52.

A coil spring 53 encircles the reduced portion of the thimble 47 and is confined between the enlarged portion thereof and the lower edge of the ring 51, so that it will be clear that when the operator grasps these lugs 48, 52, and exerts sufficient force, the beveled tooth 49 will ride upwardly along the beveled wall of the notch 50 thereby slightly rotating the thimble 47 and elevating the same against the resiliency of the spring 53.

Secured within the inner wall of the lower part of the enlarged portion of the thimble 47 is a ring 54, and this portion of the thimble is cut away at intervals to form a suitable number of recesses 55, and loosely swung on this ring and contained freely within these recesses are the pencil clamping jaws 56 that are preferably roughened on their exterior surfaces and of a general ovoidal shape, these jaws being loosely fitted around the ring near their upper portions. 55 a is a vertical slot in the outer surface of sleeve 45, and within this slot extends the inner upper edge of cap 44, so that it will be evident that said cap and sleeve will revolve in harmony. When the thimble 47 is elevated in the manner above described these jaws will swing to a vertical plane as shown at Fig. 2, but when the operator releases the finger lugs 48, 52, the spring 53 will act to force the thimble downwardly thereby forcing the lower ends of these jaws

against the beveled surfaces 46, and this will throw the jaws inwardly toward each other.

In operating my improvement the sleeve 45 is elevated and the lugs 48, 52, are then compressed in the manner above described and the pencil dropped through the thimble 47 so that its lower end will rest by gravity within the pencil bushing 13; the lugs are then released thereby causing the thimble to be forced downwardly so that the jaws will firmly grip the pencil, and the sleeve 45 will remain elevated so that in addition to the weight of the pencil there will be the weight of the sleeve, the thimble and the parts connected therewith to constantly force the pencil downwardly by gravity and thus keep the lower end of said pencil always in proper relation with respect to the cutter.

It is necessary to provide some means for preventing the rotation of the pencil bushing 13, and therefore I utilize an ordinary device for this purpose such as a screw 57 driven through the frame and having a reduced tip which extends within an elongated slot 58 in the side of said bushing, and I furthermore provide any ordinary handle 59 at the end of the crank arm 34 in order to actuate the latter.

In operating my improvement to cut the ordinary round point on a pencil, the latter is inserted within the thimble 47 with its lower end resting by gravity within the bushing 13 and clamped by the jaws 56, in the manner hereinbefore described, and the crank 34 is then revolved thus causing the pencil and the cutter to travel at their points of contact simultaneously and continuously in reverse directions. As the cutter operates to bevel off the lower end of the pencil the latter will automatically descend until its point touches the head 17, the cutter meanwhile operating to constantly sharpen or bevel off the end of the pencil, and this operation is exceedingly smooth and rapid owing to the fact that the pencil and cutter are revolved in reverse directions. The short or blunt or long or sharp points of the pencil are effected in the manner above described by the adjustment of the gage pin 15, and when the process of sharpening is completed the operator merely compresses the lugs 48, 52, and withdraws the pencil.

In the process of sharpening pencils a flat point is frequently desired particularly for the use of draftsmen, and I have therefore equipped my improvement with means for fashioning this flat point, which means I will now describe.

Referring to Fig. 1 of the drawing, 60 is an opening eccentrically located lengthwise in the crank shaft 33 throughout the length of the latter, and 61 is a plunger within said opening and capable of free movements therein and having extending from its for-

ward end a stud 62 immediately opposite a suitably shaped recess 63 in the pencil bushing 13. 64 is a rod connected to said plunger, and to the outer end of said rod beyond the crank 34 is secured any suitable knob 65. 66 is a plug which is driven within the outer end of the opening 60 and through which the rod 64 loosely extends, and 67 is a coil spring surrounding said rod and confined between the plunger 61 and plug 66, said spring acting to normally project the stud 62 within the recess 63. In cutting a round point on a pencil the rod 64 is retracted and kept in this position by the abutment of a pin 68 extending from the hub of the knob 65 against the outer end of the shaft 33 as shown at Fig. 1, but by turning this knob so that said pin will come opposite to a notch 69 in the edge of said shaft the spring 67 will then force the plunger 61 inwardly and thereby cause the stud 62 to enter the recess 63. Now when this stud 62 is within the recess 63, the revolution of the crank 34 will force said stud downwardly against the lower wall of said recess and will thereby momentarily depress the bushing 13 as well as the gage pin 15, the spring 29 being more powerful than the spring 20. The shape of the recess 63 is such that there is more or less lost motion while the stud 62 is operating within said recess, and therefore the depression of the bushing 13 and gage pin 15 by the operation of the crank 34 is such that it would occur only throughout about one-sixth of a complete revolution of said crank, although this proportion might be altered to a greater or lesser degree as the occasion might demand. The proportion between the gears 35 and 36 is such that a complete revolution of the former will effect only a half revolution of the latter, and therefore this depression of the bushing 13 and pin 15 will occur twice during a complete revolution of the gear 36, and since the pencil is revolved in harmony with the gear 36 it follows that the cutting at the point of the pencil will be deeper on opposite sides of said point during a complete revolution of the pencil while the cutting of the rest of the point will be effected as in the instance of a round point. Therefore it will be clear that by throwing the point into closer engagement with the cutter at predetermined times so that opposite portions of said point will be cut deeper than the rest of the point a flat point may be obtained and this is something that has never before been done. Of course it will be clearly understood that the closer the cutting relation between the pencil and the cutter the deeper will be the cut effected, and therefore the same result can be obtained by adjusting the cutter itself at predetermined times nearer to the pencil, and accordingly I have illustrated at Fig. 4 a modification

of my improvement in this respect which I will now describe.

70 is an L-shaped lever whose horizontal member is supported on one of the bottom plates 2 immediately below the frame 3 while the upright member terminates in a beveled lug 71 adapted to be engaged by a beveled lug 72 carried by the gear 35 near its periphery. This L-shaped lever is capable of a free shifting movement toward and away from the casing 1, and when the lug 72 engages the lug 71 it will force said lever toward said casing, a coil spring 73 having its extremities secured respectively to said lever and to a pin 74 rising from the plate 2 serving to normally retract said lever. The lower journal of the cutter roll 10 is carried by the horizontal member of this lever 70 and extends through an enlarged opening 75 in the frame 3, so that it will be clear that as the crank 34 is revolved the cutter roll 10 will be thrown inwardly toward the pencil bushing whenever the lug 72 engages the lug 71, and this engagement of these lugs and the consequent inward throw of the cutter roll occurs throughout only about one-sixth of the revolution of the crank 34, the pencil being rotated only half a complete revolution while the gear 35 is completing a whole revolution, and therefore the same results as to the formation of a flat point will be obtained as in the instance above described with respect to Fig. 1. But, although I have illustrated and described instrumentalities for forming a flat point on a pencil, I do not wish to be understood as making any claim thereto in the present application.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:—

1. A pencil sharpening machine, comprising a casing, a frame secured therein, a rotary cutter journaled in said frame, a pencil bushing stationary as to rotation and having extending therethrough a tapered opening and cut away adjacent to said cutter, rotary pencil clamping devices freely movable vertically, and means supported and journaled within said frame for causing said devices and cutter to simultaneously and continuously travel in reverse directions at their points of contact.

2. In a machine of the character described, the combination of a casing, a frame secured therein, a rotary cutter journaled in said frame and carrying a small spur gear, a pencil bushing having extending there-through a tapered opening and cut away adjacent said cutter, rotary pencil clamping devices adapted to hold the pencil with the lower extremity resting by gravity within said bushing, a rotary crank shaft journaled in said frame and carrying a bevel gear, a horizontal gear supported on said frame and meshing at its outer periphery with the first

named gear, connections between said horizontal gear and the pencil clamping devices whereby the latter will be rotated, and a ring rigid with said horizontal gear and having spur teeth on its inner periphery which engage said spur pinion whereby the cutter and pencil clamping devices are simultaneously and continuously caused to travel in reverse directions at their points of contact.

3. In a machine of the character described, the combination of a pencil bushing having extending therethrough a tapered opening, a stationary thimble having in its bottom edge shallow and deep notches, a gage pin extending freely through said thimble and whose head is immediately below said bushing, a spring acting to normally project said pin toward said bushing, and a collar carried by said pin and having a tooth adapted to engage said notches when the pin is rotated whereby a maximum and minimum distance may be effected between said bushing and pin.

4. In a pencil sharpening machine, the combination with a rotary cutter and a pencil receiving bushing adjacent said cutter, of a rotary pencil clamp freely movable vertically whereby when elevated a pencil clamped therein will rest by gravity within said bushing, and means for causing said

pencil and cutter to simultaneously and continuously travel in reverse directions at their points of contact.

5. In a machine of the character described, the combination of the casing, the frame supported therein, a rotary cutter journaled in the frame, a vertically adjustable pencil holder bushing guided within said frame and having extending therethrough a tapering recess said bushing open at one side to admit the cutter, an adjustable gage pin immediately below said bushing, means carried by said pin and connected with said bushing for regulating the distance between said pin and bushing, pencil clamping devices supported within said frame and capable of free vertical movements whereby the pencil may be clamped with said devices attached thereto in elevated position thereby causing the lower end of said pencil to constantly bear against said bushing owing to the gravity of the pencil and said devices, and means for causing said cutter and devices to simultaneously and continuously travel in reverse directions at their points of contact.

In testimony whereof I affix my signature in presence of two witnesses.

EDGAR P. WEBSTER.

Witnesses:

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M. T. LONGDEN.