

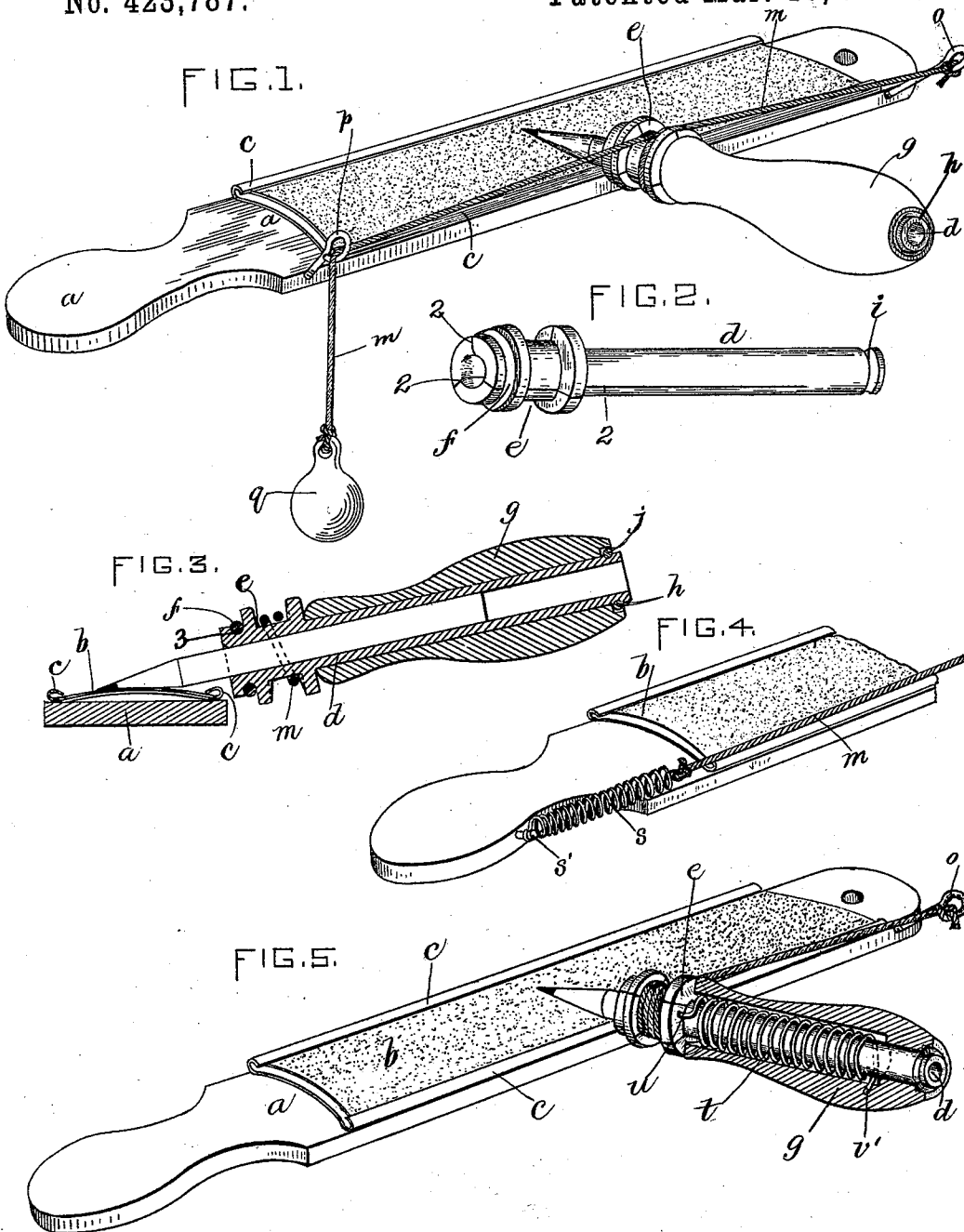
(No Model.)

2 Sheets—Sheet 1.

E. H. LYON.  
PENCIL SHARPENER.

No. 423,787.

Patented Mar. 18, 1890.



WITNESSES:  
*J. D. Harrison*  
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INVENTOR:  
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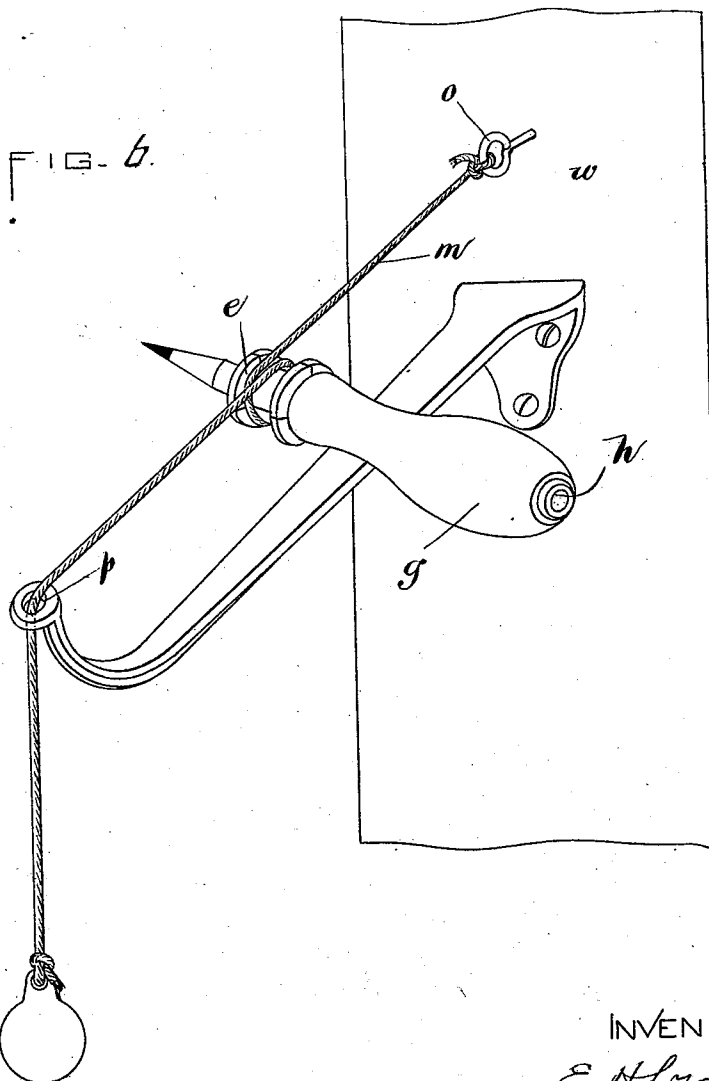
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WITNESSES:

*A. D. Hanson.*  
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# UNITED STATES PATENT OFFICE.

EDWARD H. LYON, OF NEEDHAM, MASSACHUSETTS.

## PENCIL-SHARPENER.

SPECIFICATION forming part of Letters Patent No. 423,787, dated March 18, 1890.

Application filed November 12, 1889. Serial No. 329,985. (No model.)

### *To all whom it may concern:*

Be it known that I, EDWARD H. LYON, of Needham, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Pencil-Sharpeners, of which the following is a specification.

This invention has for its object to provide a simple and effective pencil-sharpener capable of being manufactured at a very small expense and adapted to produce a point of any degree of taper that the operator may desire and to permit the convenient inspection of the work.

To these ends the invention consists, first, in the combination of a pencil-holding chuck provided with a wheel or pulley, a handle loosely mounted on the chuck at one side of said wheel or pulley, and a cord attached at one end to a support and engaged with the pulley, the said handle being formed to be grasped by one hand of the operator, who is thereby enabled to move the chuck laterally and cause at the same time the rotation of the chuck in the handle by the action of the cord on the wheel or pulley of the chuck.

The invention also consists in the combination of a bed or tablet having an abrasive surface, a pencil-holding chuck adapted to grasp the pencil to be sharpened and having at one end a wheel or pulley, a handle in which said chuck is journaled to rotate freely, said handle being formed to be grasped by the operator, and a cord secured at one end to a support and engaged with the wheel or pulley of the chuck, whereby when the chuck and handle are moved laterally by the operator the chuck will be rotated in handle and will rotate the pencil while the same is in contact with and moving upon the abrasive surface.

The invention also consists in the special construction of the bed or tablet and of the chuck and handle, all of which I will now proceed to describe and claim.

In the accompanying drawings, forming a part of this specification, Figure 1 represents a perspective view of a pencil-sharpener embodying my invention. Fig. 2 represents a perspective view of the chuck detached from the handle. Fig. 3 represents a longitudinal section of the chuck and handle and a trans-

verse section of the bed or tablet. Figs. 4, 5, and 6 represent perspective views of modifications.

The same letters and figures of reference indicate the same parts in all of the figures.

Referring for the present to Figs. 1, 2, and 3, *a* represents the bed or tablet, which is here shown as a strip of wood having one end formed as a handle *a'*. To one side of the bed is detachably secured a strip *b*, of sand-paper or other suitable abrasive material. I prefer to provide the bed with longitudinal ribs or beads *c c*, under which are slots or pockets to receive and hold the edges of the strip *b*, said ribs being preferably the bent-over edges of a piece of sheet metal attached to the bed *a*, said piece being of concavo-convex form in cross-section, as shown in Fig. 3, so that its upper surface constitutes a convex bed supporting the sand-paper. If desired, the ribs or beads *c* may be integral with the bed *a* and provided with longitudinal slots made by a saw or other tool to receive the edges of the strip *b*. I prefer to use a sand-paper strip which is doubled or folded upon itself lengthwise, so that when one side is worn out the strip may be removed and reinserted with its other side uppermost. The convex form of the abrading-surface is important, because it prevents the slight rocking or tilting motion that is almost unavoidably given the pencil by the movements of the chuck, which is guided and controlled by the operator's hand, from giving the pencil-point a slight longitudinal convexity, the convex abrading-surface compensating sufficiently for the said rocking or tilting motion to give the point a true taper or a slight longitudinal concavity, which is more desirable than a longitudinal convexity. The inner rib or bead *c* on the bed *a*, or the one next the chuck, serves as a rest for the pencil, and is valuable as a guide when the device is used by an inexperienced person, the pencil being held on said rib until the point is sufficiently formed, as shown in Fig. 3. The parallel ribs *c c* enable the sand-paper strip *b* to be very easily and expeditiously applied and removed, so that the abrasive surface can be renewed at any time at a trifling expense and without the employment of skilled labor.

*d* represents the chuck, which is composed of a tube having a bore of sufficient diameter to receive a pencil, said tube being preferably made of wood. Longitudinal slits 2 are formed in the tube from one end partly to the other end, said slots converting the end in which they are formed into yielding jaws. On the split portion of the tube is formed a pulley *e*, which is preferably integral with the tube and split like the latter, the slits 2 extending through the pulley, as shown in Fig. 2. The split end of the tube at one side of the pulley is provided with a peripheral groove 3, which receives an elastic band *f*, of india-rubber or other suitable material, which exerts an inward pressure on the chuck-jaws. The chuck-jaws, being held by the elastic band *f* at their extreme outer ends, are enabled to grasp and securely hold very short pencils.

*g* represents the handle, which is formed to be grasped by one hand of the operator and is mounted loosely on the chuck-tube, the latter being adapted to rotate freely in the handle. The chuck is prevented from withdrawal from the handle by a ring *h*, sprung into a peripheral groove *i* in the rear end of the chuck-tube after the chuck is inserted in the handle, said ring being of greater diameter than the chuck-containing socket or bearing in the handle, so that the chuck cannot be withdrawn from the handle. I prefer to form an annular cavity *j* in the rear end of the handle to receive the ring *h*, as shown in Fig. 3.

*m* represents a cord attached at one end to a stud *o*, affixed to the bed *a* and provided at its free end with a weight *q*, the cord being supported and guided between its free and attached ends by a guide-eye *p*, attached to the bed *a*. The cord is engaged with the chuck-pulley *e*, preferably by being coiled around the same, although, if desired, the cord may simply pass along one side of the pulley in frictional contact therewith, instead of being coiled around the pulley. It will be seen that the cord constitutes a connection between the chuck-pulley and the bed *a*, and that when the operator holds the handle *g* so that the end of the pencil in the chuck lies upon the abrasive surface *b*, as indicated by Figs. 1 and 3, and moves the handle laterally, said connection will cause the chuck to rotate in the handle. The pencil is thus moved laterally along the abrasive surface and at the same time rotated with the chuck. The cord is so arranged with reference to the chuck-pulley that the pencil rotates in a direction opposite to the direction of its lateral movement along the abrasive surface, so that a rapid cutting action is caused by the described movements of the pencil. The described connection between the chuck-pulley and the bed is of such a flexible nature that the operator can hold the pencil at any desired angle to the abrasive surface, and thus give the point any desired degree of taper. The said flexible con-

nection also enables the operator to sharpen the point of the lead independently of the wooden sheath after the latter has been suitably cut away.

In practice the operator, after chucking the pencil, moves the chuck and handle rapidly back and forth on the abrasive surface until the pencil is sharpened. The weight *q* keeps the cord taut and under sufficient tension to maintain its operative engagement with the chuck-pulley. It is obvious, however, that a spring *s* may be substituted for the weight for the same purpose, one end of the spring being attached to an arm or stud *s'* on the bed and the other end to the cord *m*, as shown in Fig. 4.

In Fig. 5 I have shown a modification, in which the cord *m* is attached at one end to the chuck-pulley *e* and wound upon the same, its other end being attached to the stud *o* on the bed, as in the previously-described construction. In this modification a spring *t* is employed, which is attached at one end to the chuck-pulley at *u* and at the other end to the handle *g* at *v'*, the arrangement being such that when the handle is moved away from the stud *o* the chuck will be rotated by the cord connecting it with said stud, as in the construction first described, and at the same time the spring *t* will be "wound up" or put under increased tension, so that when the handle and chuck are moved in the opposite direction the spring will rotate the chuck in the direction required to rewind the cord on the chuck-pulley, thus preparing the cord to again serve as a chuck-rotating connection during the next movement of the chuck and handle away from the fixed end of the cord.

In all the forms here shown the essential features are, first, the pencil-holding chuck mounted to rotate freely in a handle which is adapted to be moved back and forth by the operator, and provided with a wheel or pulley and a cord attached by a suitable device at one end to a support and engaged with said pulley, whereby the movements of the handle and chuck by the operator are caused to rotate the chuck in the handle. It will also be seen that the cord constitutes a flexible pulley-rotating device, which enables the angle at which the pencil is held to be varied while the pencil is being rotated. This adaptability to change the angle of the pencil while it is being rotated is important, because it enables the operator to exercise a considerable degree of judgment in forming the point by holding the pencil at one angle while cutting away the wood and at a different angle while sharpening the lead.

The handle and chuck may be used in connection with an abrading device which is supported independently or held by the operator's hand. For example, the stud *o* (shown in Fig. 5) may be affixed to a fixed support, as a desk or wall, and a pencil secured to the chuck and handle constructed and connected with the stud *o*, as shown in said figure, may

be presented to an abrasive tablet held by one hand of the operator, the other hand being used to operate the handle and chuck in the manner already described.

5 The bed or tablet may have a metallic filing-surface instead of a sand-paper surface.

An important advantage of my improved pencil-sharpener is the freedom it affords for inspecting the point of the pencil during the sharpening operation, the point being at all times in full view of the operator, who is thus enabled to vary the form of the point at will.

In Fig. 6 I show a modification, in which the cord *m* is attached to an eye *o*, which is affixed to a wall or other rigid support *w*. An arm or bracket *x* is attached to the support *w* below the eye *o*, and is provided with a cord-guide *p* at its outer end. The cord is engaged with the chuck-pulley between the eye *o* and the cord-guide *p*, and the chuck is rotated by movements of the handle, as above described. The abrasive bed or tablet will in this case be held by one hand of the operator.

This embodiment of the invention will be useful in schools, where a large number of abrasive tablets may be provided, so that each pupil may have a tablet, and all may resort with their tablets to the fixture shown in Fig. 6 to sharpen their pencils.

30 I claim—

1. In a pencil-sharpener, the combination of a pencil-holding chuck provided with a wheel or pulley, a tubular handle formed to be held in the operator's hand, having a longitudinal socket in which the chuck is journaled, a cord attached at one end to a suitable support and engaged with the periphery of the pulley on the chuck, and means for exerting tension on said cord, and thereby keeping it operatively engaged with the chuck-pulley, said handle constituting a freely-movable carrier and bearing whereby the chuck may be held at any desired angle or inclination and carried back and forth by the hand of the operator while it is being rotated by the co-operation of the said cord with the wheel or pulley of the chuck, the said cord permitting the angle of the pencil to be varied while the pencil is rotating, as set forth.

50 2. In a pencil-sharpener, the combination of a bed or tablet having an abrasive surface, a cord arranged substantially parallel with the bed, means for exerting a tension on the cord, a pencil-holding chuck having a pulley with which the cord is in operative contact, and a tubular handle having a longitudinal socket or bearing in which the chuck is journaled to rotate freely, said handle constituting at once a carrier and a bearing whereby the latter may be reciprocated later-

ally and permitted to rotate while reciprocating.

3. In a pencil-sharpener, the combination of a bed or tablet having an abrasive surface and a cord-guiding eye, a cord attached at one end to said bed or tablet and passing freely through said eye, said cord having a weight at its free end, whereby a tension is exerted on the cord, a pencil-holding chuck having a pulley adapted to be acted on by said cord, and a tubular handle having a longitudinal socket or bearing in which said chuck is adapted to rotate freely, as set forth.

4. In a pencil-sharpener, the bed or tablet having a convex supporting-surface, a strip of sand-paper or like abrasive material supported in convex form by said surface, and ribs or beads at opposite edges of said surface having longitudinal pockets to receive the edges of the sand-paper, said ribs projecting above the surface of the sand-paper, so that either rib is adapted to serve as a rest or guide for a pencil presented to the sand-paper, as set forth.

5. In a pencil-sharpener, the chuck composed of a tube and a pulley formed therewith, one end of the tube and the pulley thereon being split longitudinally to form yielding jaws, and an elastic band encircling the split portion of the tube and pressing said jaws inwardly, as set forth.

6. In a pencil-sharpener, the combination of the chuck composed of a tube split longitudinally at one end to form yielding jaws and provided at its split end with a pulley and with a jaw-closing band or spring, the tubular handle fitted loosely upon the tube, the latter being adapted to rotate freely in the handle, and a retaining-ring sprung into a groove in the rear end of the tube and constituting an enlargement, whereby the withdrawal of the tube from the handle is prevented, as set forth.

7. In a pencil-sharpener, a bed or tablet having an abrasive surface which is convex in cross-section, combined with means for reciprocating a pencil laterally over said surface and at the same time rotating the pencil, the convex form of said surface enabling it to form a longitudinally-concave pointed end on the pencil, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 7th day of November, A. D. 1889.

EDWARD H. LYON.

Witnesses:

C. F. BROWN,  
A. D. HARRISON.