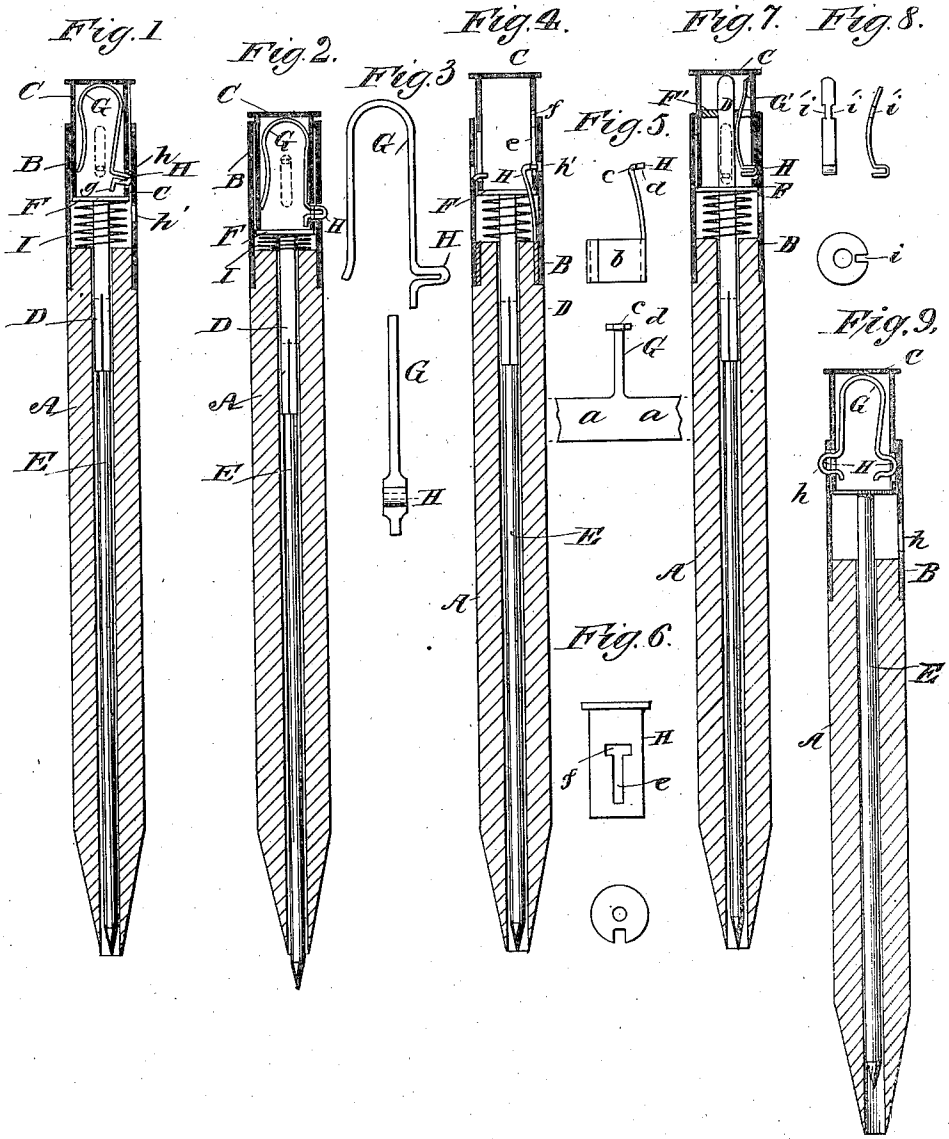
(No Model.)

J. HOFFMAN.

PENCIL.

No. 365,747. Patented June 28, 1887.



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PENCIL.

SPECIFICATION forming part of Letters Patent No. 365,747, dated June 28, 1887.

Application filed March 31, 1887. Serial No. 233,219. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH HOFFMAN, a citizen of the United States, and a resident of Hoboken, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Pencils, of which the following is a specification.

My invention relates to improvements in pencils of the class in which the lead is movable in the stick or handle and is retractible and extendible into and from the pencil-stick by movement of a cap or tube placed preferably at the rear end of the pencil, to which the lead is directly or indirectly attached, in which class of pencils, also, the stick or handle is cut away as the lead wears off.

In the drawings the same reference-letters refer to the same parts in all the figures.

Figure 1 illustrates a longitudinal section of a pencil embodying my invention, the lead being retracted. Fig. 2 illustrates a like view, the lead being projected. Fig. 3 illustrates the details of construction of the spring-catch as shown in Figs. 1 and 2. Fig. 4 illustrates in longitudinal section a modified construction of the invention, showing especially a different method of constructing the spring-catch. Fig. 5 illustrates the details of construction of the spring-catch shown in Fig. 4. Fig. 6 illustrates the construction of the spring-depressing washer and also the slot in the movable cap shown in Fig. 4, with which slot the spring-catch engages. Fig. 7 illustrates still another modification of construction of the spring-catch. Fig. 8 illustrates the details of construction of the spring-catch shown in Fig. 7, and of the washer which holds it in place. Fig. 9 illustrates a pencil embodying my invention, but not having the automatic lead-retracting devices.

I will first describe my invention as illustrated in Figs. 1, 2, and 3.

A is the pencil stick or handle. It is recessed longitudinally to receive the movable lead. It may be made of any suitable material which may be cut, filed, or otherwise removed as the lead wears away. I prefer to employ wood.

B is a tube attached to the rear end of the pencil-stick.

C is a movable cap, which slides easily within the tube B.

D is a small tube, which holds at its lower end the lead E, the tube D being preferably split, as usual, for that purpose.

F is a washer of such size as to fit in the tube B, but have easy movement therein. The lead-holding tube D is attached at its upper end to this washer F. The longitudinal movement of the cap C relative to the tube B is limited, and twisting of the cap relative to the tube B is prevented by means of a little lug or ear, which is preferably partially punched out of the tube B, and is turned inwardly and enters and moves in a slot cut in the movable cap C. There may be as many of these ears and slots as desired.

G is a spring, which may be bent in the form shown or made in any other desired form, and is sprung into place within the cap C, being held in position therein by its own elasticity and by the bearing of the catch H in the hole *h* in the cap C. The other end may be elongated, if desired, so as to bear on the washer F, and other means—such as solder or rivets—may be employed, if desired, to hold the spring in place.

H is an outwardly-extending bend or elbow formed in or attached to the spring G, which constitutes a catch, as hereinafter described. It has sufficient length to extend through a hole, *h*, made in the wall of the cap C, and through a similar hole, *h'*, made in the tube B, and project somewhat beyond the outer surface of the tube B.

I is a spring which abuts against the end of the pencil-stick and the under side of the washer F at its respective ends. Its elasticity holds the washer F against the lower end of the cap C. I prefer to widen the spring G somewhat at the point where the catch H occurs, if the catch be formed by making bends in the spring, as shown, so that the catch may have greater stiffness.

The operation is as follows: Assuming that the lead is retracted, to project the lead pressure is applied to the end of the cap C, which transmits it to the washer F and the spring I, which is compressed thereby. When the cap has been depressed to such an extent that the hole *h* in the cap becomes coincident with the hole *h'* in the tube B, the catch H is thrown outwardly through these holes by the elasticity of the spring G, and the cap and tube are by it locked together, the lead being held in its projected position ready for use. When it is desired to retract the lead, pressure is applied

to the end of the catch H, which, as above stated, projects slightly beyond the surface of the tube B when the lead is projected, and it is pressed back again through the holes *h* and *h'* until the catch loses its hold on the tube B. When this occurs, the spring I immediately returns the parts to their original position, retracting the lead. The outer end of the catch I prefer to make rounded, as shown, to facilitate this operation. As the lead wears away, the pencil-stick is cut off or otherwise removed, so as to preserve the proper length of the stick relative to the length of the lead.

In Figs. 4, 5, and 6 I illustrate a modified construction of the parts. In this instance the spring-catch H is attached to the top of the pencil and does not move with the cap C. The spring is preferably blanked out from sheet metal, as shown in Fig. 5, there being a flat piece, *a*, which is rolled up into tubular or ring form, as shown at *b*. This tubular part fits over the upper end of the pencil inside of the tube B. The elbow or catch H is made of two dimensions—a wide part, *c*, and a narrow part, *d*—and the cap C has a slot, *e*, in it which is enlarged crosswise, as at *f*, at its upper end. The external tube, B, has a hole, *h'*, in it adapted to receive the smaller part *d* of the catch H. This small part lies in the slot *e*, made in the cap C, as it moves downward, until the wider part *c* of the spring-catch comes opposite the enlarged recess *f* at the upper part of the slot in the cap. The catch then springs outwardly and locks the cap in its depressed position by the engagement of the wide part *c* of the catch in the enlarged part *f* of the slot, and the small or narrow part *d* of the catch projects through the hole *h'* in the tube B, which, being pressed upon, presses the catch back and releases the engagement between the catch and the cap. In this construction the spring I should preferably be reduced in size, so as not to interfere with the operation of the spring-catch; or the spring part of the catch may be placed inside of the spiral spring, if preferred.

In Figs. 7 and 8 I show still another modified construction of the spring-catch and adjoining parts. In this instance the lead-holding tube D is carried upwardly through the washer F and through the cap C, (although it need not necessarily go all the way through the cap,) and a washer, F', or its equivalent, is attached to the tube D, or otherwise fastened in place within the cap, and a spring, G', which has the catch H at its lower end, is held in place within the cap by engaging with the washer F' or its equivalent. A convenient and effective means of securing this engagement is shown at *i i'*, Fig. 8, the washer F' being recessed, as at *i*, and the spring G being rendered laterally adjustable, as at *i'*, the reduced part entering and being held by the recess in the washer. The operation of this form of construction is obvious without further description.

In Fig. 9 I illustrate a construction in which there is no spring to automatically retract the lead. In this instance the lead is retracted and projected by hand, and the spring-catch engages in one hole in the tube to lock and hold the lead when retracted and in another to lock and hold it when projected. These two holes may be made both on the same side of the pencil, in which case the same catch will serve both purposes; or they may be made on opposite sides of the pencil, and if so there will be another catch made on the other end of the spring G. I illustrate this last-mentioned method in the drawings because I prefer it to the other, because the pencil is more easily manipulated when the holes are on opposite sides.

I am aware that pencils constructed on the general plan of those illustrated by me—that is to say, having a movable cap controlling the movement of a lead and a pencil-stick the end of which is removed as the lead wears off—have been heretofore patented, and I do not claim the same, broadly.

Having described my invention, I claim—

1. The described improvement in pencils, consisting in the combination of a longitudinally-bored pencil-stick constructed and arranged to be removed as the lead wears away, a spring-controlled lead-holding tube longitudinally movable relative to the pencil-stick, a longitudinally-movable spring-controlled cap which communicates motion to the lead-holding tube, and a spring catch which, when the lead is projected, locks the movable cap against return movement, the said spring-catch being operated externally of the pencil, substantially as set forth.

2. The described improvement in pencils, consisting in the combination of a longitudinally-bored pencil-stick constructed and arranged to be removed as the lead wears away, a longitudinally-movable lead-holding tube, and a longitudinally-movable cap which communicates motion to the lead-holding tube, and a spring-catch which, when the lead is projected, locks the movable-cap against return movement, the said spring-catch being operated externally of the pencil, substantially as set forth.

3. The described improvement in pencils, consisting in the combination of a longitudinally-recessed pencil-stick constructed and arranged to be removed as the lead wears away, a longitudinally-movable lead-holding tube, and a longitudinally-movable cap which communicates motion to the lead-holding tube, and a spring-catch which locks the lead both in its projected and in its retracted position, substantially as set forth.

Signed at New York, in the county of New York and State of New York, this 26th day of March, A. D. 1887.

JOSEPH HOFFMAN.

Witnesses:
JOHN H. IVES,
PHILLIPS ABBOTT.