

No. 839,806.

PATENTED JAN. 1, 1907.

F. E. V. BAINES.  
PENCIL SHARPENING MACHINE.

APPLICATION FILED FEB. 10, 1906.

2 SHEETS—SHEET 1.

FIG. 1.

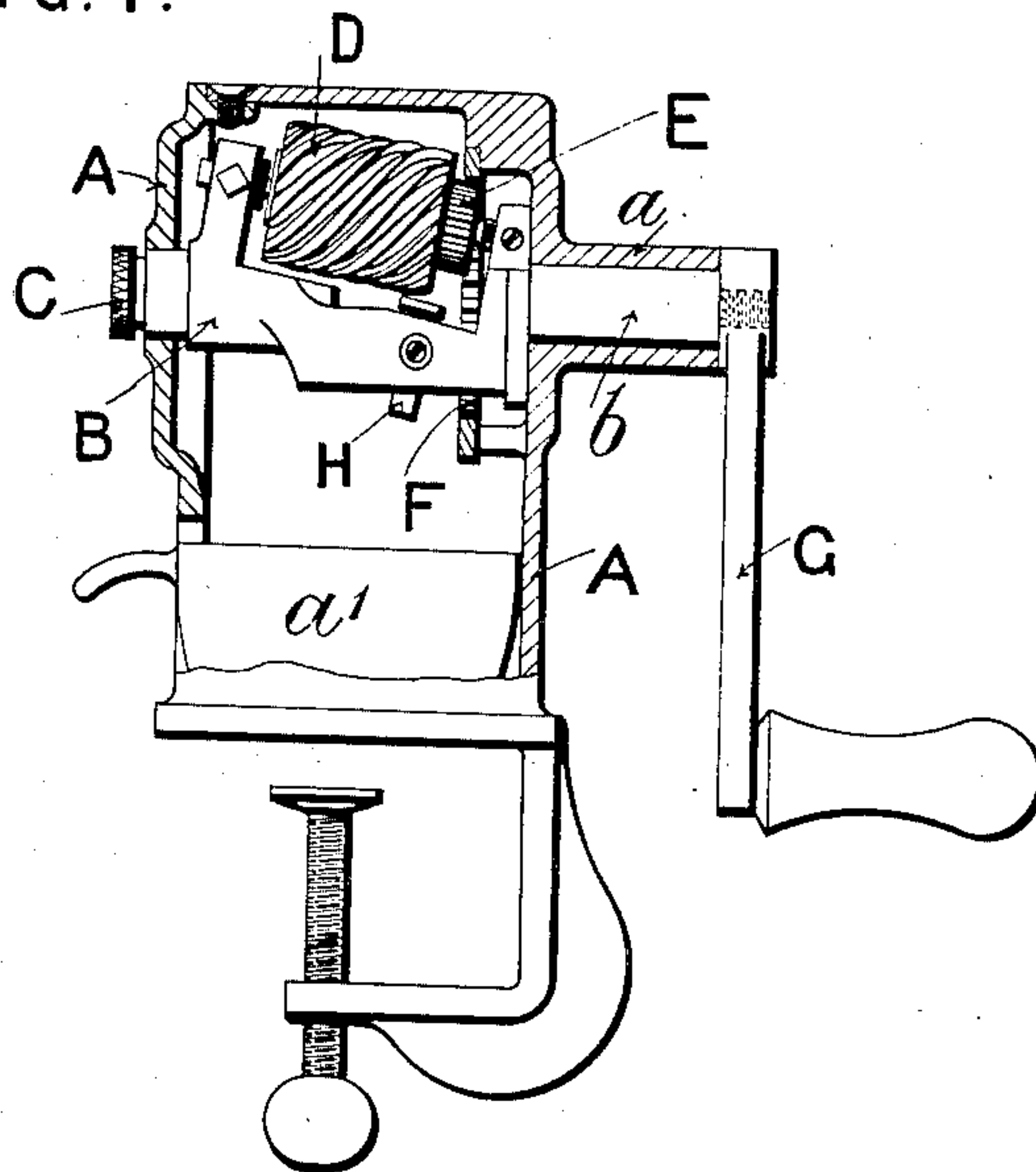
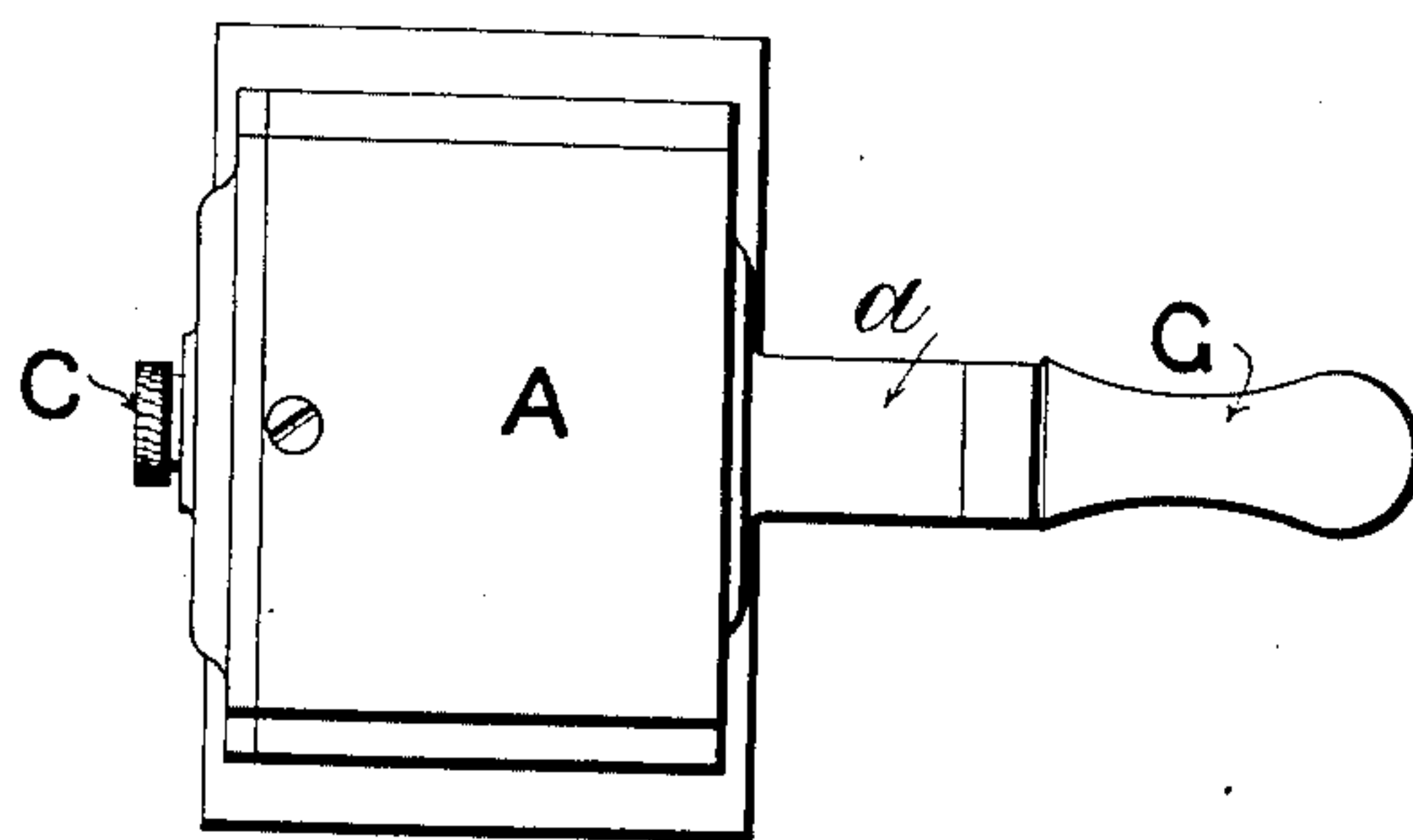


FIG. 2.



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2 SHEETS—SHEET 2.

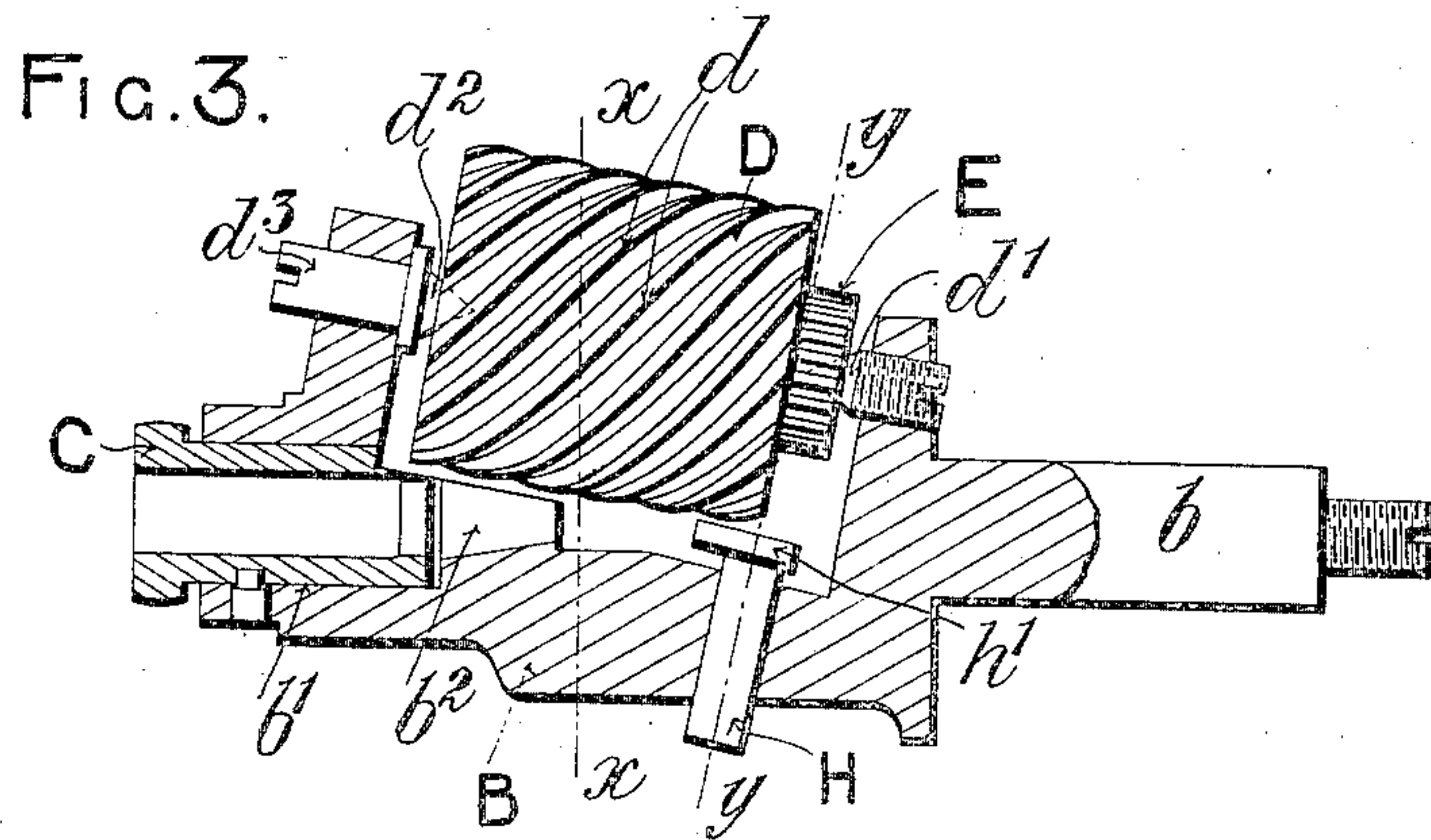


FIG. 4.

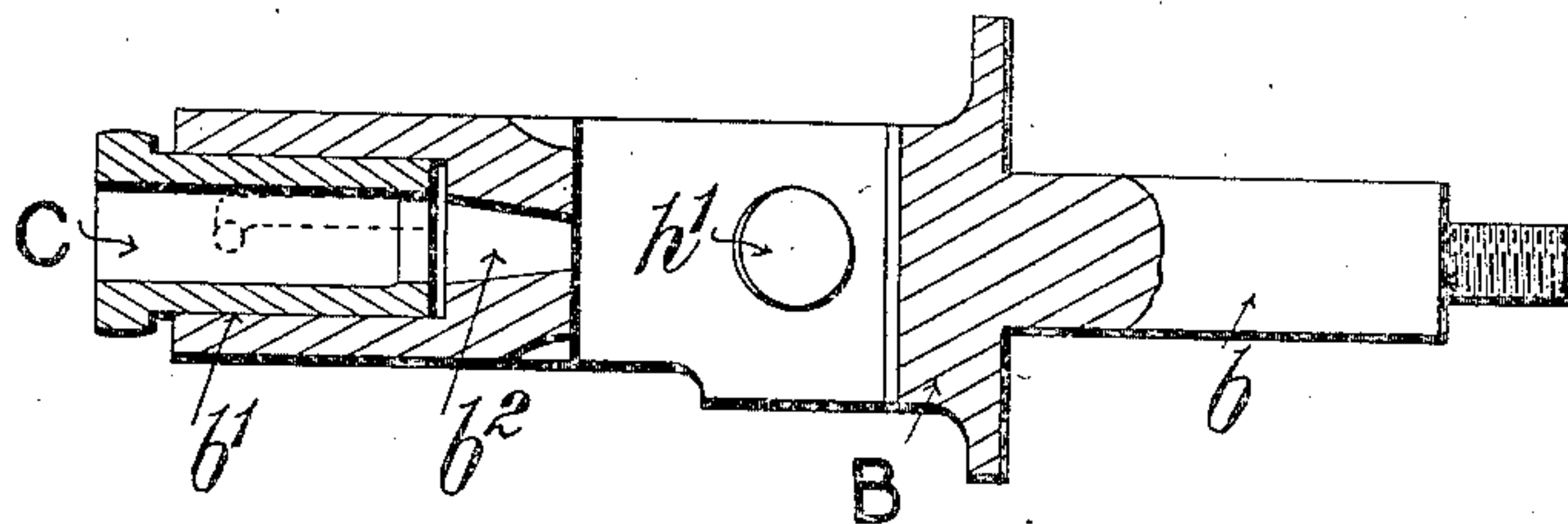


FIG. 5.

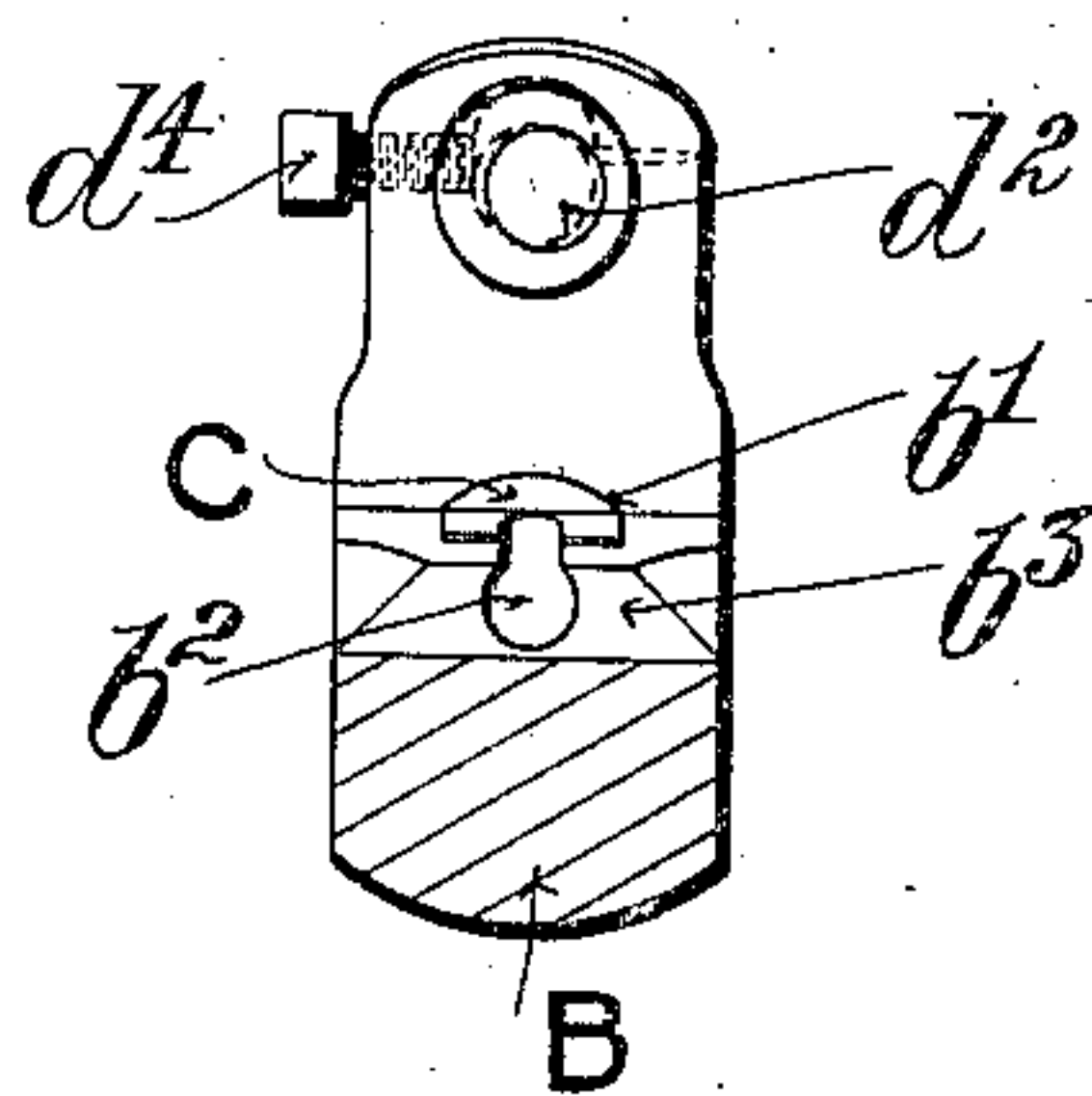
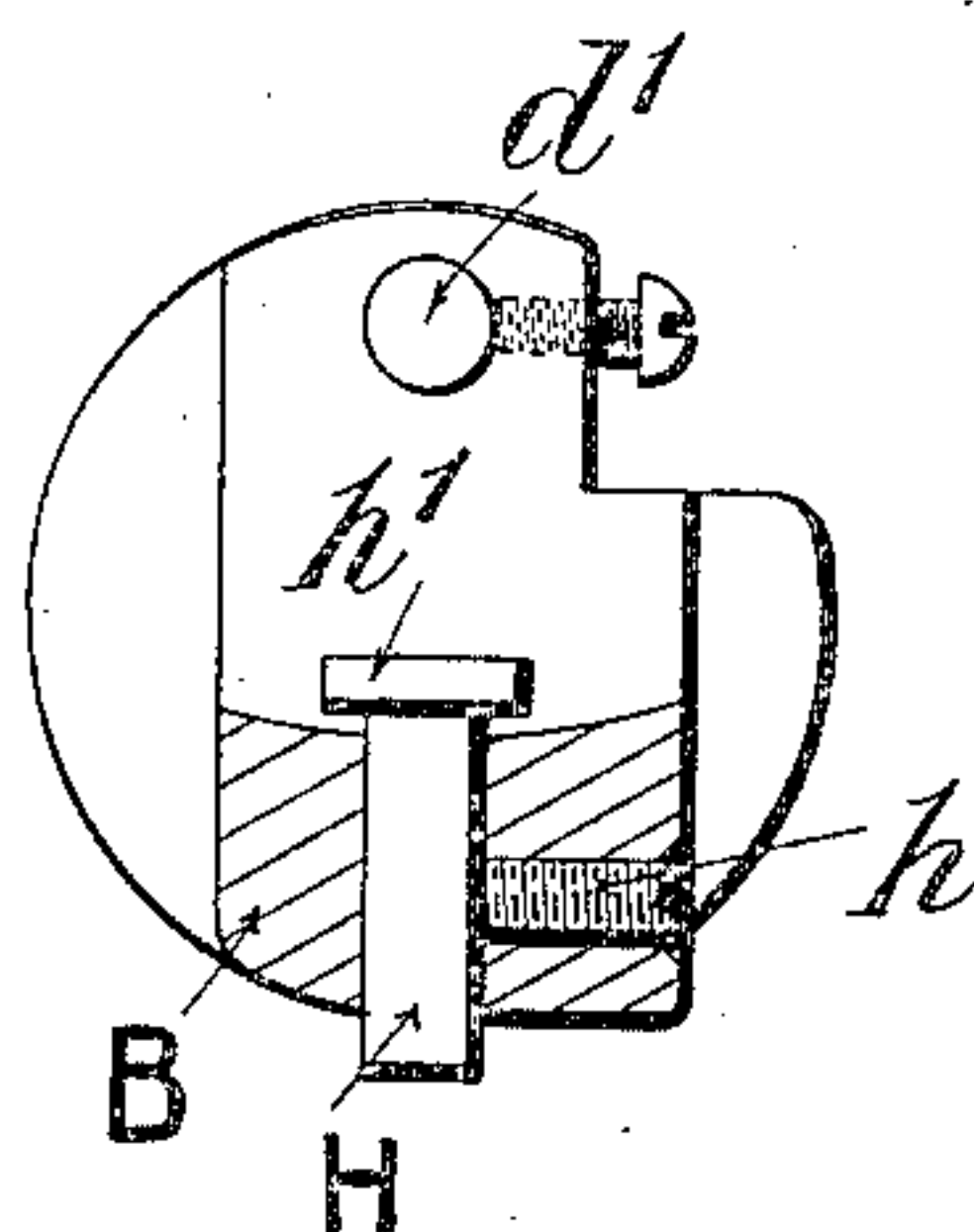


FIG. 6.



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# UNITED STATES PATENT OFFICE.

FREDERICK EDWARD VESEY BAINES, OF GREENWICH, ENGLAND.

## PENCIL-SHARPENING MACHINE.

No. 839,806.

Specification of Letters Patent.

Patented Jan. 1, 1907.

Application filed February 10, 1906. Serial No. 300,386.

*To all whom it may concern:*

Be it known that I, FREDERICK EDWARD VESEY BAINES, a subject of the King of Great Britain and Ireland, residing at 16 Gloucester Place, Greenwich, in the county of Kent, England, have invented a new and useful Improvement in Pencil-Sharpening Machines, of which the following is a specification.

This invention relates to that type of machine for sharpening pencils in which a revolving cutter adapted to cut away both the wood and the lead of the pencil is given a planetary motion around the pencil; and the object thereof is to provide a machine that will produce a smooth and even point to a pencil with great facility and rapidity without breaking the lead, that will not cut the pencil to waste, and that will enable the adjustment consequent on the resharpening of the cutter to be readily and easily made, and that can be assembled, set, and adjusted in the process of manufacture with a minimum amount of labor.

As is usual in this type of machine, the cutter-holder is mounted in bearings in a suitable frame and is provided with suitable means for rotating it, whereby not only is a rotary motion imparted to the cutter, but also, a planetary motion to the said cutter around the pencil, which is located in the hollow axle of the cutter, which forms a guide for the pencil.

In this type of pencil-sharpening machine two difficulties have presented themselves: first, to adjust the position of the cutter after it has been resharpened, and thereby become slightly reduced in diameter, and, second, to regulate the degree of sharpness of the point produced and to prevent the pencil being cut to waste.

To overcome the first difficulty, I mount the cutter on coned or spherically-shaped centers one or both of which are eccentrically adjustable, so that the cutter can be adjusted radially with respect to the axis of the frame carrying it.

To overcome the second difficulty, I mount in the frame carrying the cutter, under the forward end of said cutter—i. e., the end nearest to the axis of the frame—a stop to limit the longitudinal movement of the pencil with respect to the cutter and arrest it when a proper point has been cut, and thus prevent waste of the pencil.

In the accompanying drawings, which illustrate by way of example a machine with a

cylindrical cutter constructed according to this invention, Figure 1 is a view in side elevation, partly in section. Fig. 2 is a view in plan. Fig. 3 is a view in longitudinal section, on an enlarged scale, of the cutter-frame and cutter. Fig. 4 is a view therein in plan, partly in section; and Figs. 5 and 6 are views in transverse section on lines *x x* and *y y*, respectively, of Fig. 3, with the cutter removed.

Throughout the views similar parts are marked with like letters of reference.

In a suitable stand or casing A, adapted to be clamped or otherwise securely fixed to a desk, table, or other support, is mounted a yoke-shaped frame B, one end of which forms an axle *b*, which is mounted in a bearing *a* in the said stand or casing. In the other end of the frame B is an axially-arranged hole *b'*, adapted to form, in conjunction with a bush C, a guide for the pencil.

In the frame B is mounted a cutter D of cylindrical form, the axis of which lies at an angle with the axis of the frame B. This cutter has helically-arranged cutting edges *d*, which are undercut and "backed off" for facility of action and are formed at a considerable angle with the axis of the cutter, so that the cut on the pencil may be as far as practicable in the direction of the grain of the wood. The cutter D is mounted in the frame B, so that it rotates at such an angle with the axis of the said frame as will produce a point to the pencil of the desired taper and with the spiral cutting edges moving toward the end *b* of the frame B—i. e., toward the point of the pencil. The cutter D is caused to rotate about its axis and also to rotate around the axis of the frame B by means of a spur-pinion E, carried by the cutter-gearing, with an internal toothed wheel F fixed in the stand or casing A, the axle *b* of the frame B being provided with a suitable cranked handle G for imparting rotary motion to it. The base of the stand or casing A may be provided with a drawer *a'* to receive and contain the shavings.

The cutter is mounted on coned centers *d'* and *d''*, one or both of which is or are capable of eccentric adjustment with respect to the axis of the frame in which they are mounted, which enables the position of the cutter to be both radially adjusted with respect to the axis of the pencil-guide to compensate for any reduction on the diameter of the cutter due to regrinding or sharpening and also to be angularly adjusted to vary the angle of



the cone forming the point of the pencil. In the drawings only one of the centers—viz.,  $d^2$ —is so arranged, the said center being formed eccentrically on a pin  $d^3$ , capable of being rotated in the frame B and locked in any desired position therein by means of a set-screw  $d^4$ .

The hole  $b'$  is made parallel for a portion of its length to receive the bush C; but its inner end  $b^2$  is tapered to an angle corresponding to the angle the axis of the cutter makes with the axis of the frame B, and the face  $b^3$  of the frame opposite to the edge of the cutter is then cut away to expose the said coned part  $b^2$  of the hole  $b'$ . The bushes C are made of various internal diameters, so as to take pencils of various sizes; but in all cases the said bushes are stepped, so as to slightly restrict their bores or internal diameters at their inner ends, the object being to make the said inner end the actual guide and give sufficient clearance in the other part of the holder to accommodate a pencil of an irregular shape. To this end the bush used for any particular make or brand of pencil should fit the same loosely throughout the major portion of its length, but closely at the restricted part, which said part permits a pencil having a slightly larger diameter to pass through without difficulty, as the wood becomes slightly compressed. If the guide is made to fit the pencil closely throughout its length, it is found that a slightly larger or crooked pencil cannot be passed through without undue pressure. The inner end of the bush C is cut away to coincide with the cut-away part of the face  $b^3$  of the frame, as shown. To retain the bush in the frame, it is locked in position by a bayonet-joint attachment or similar device.

In the frame B, under the forward end of the cutter D, on a line with and approximately at right angles to the axis of said cutter, is a stop for the lead of the pencil to abut against when the pencil is sufficiently sharpened, and thus prevents its further forward movement, which would only cause the pencil to be cut to waste. The stop consists of a pin H, adjustable vertically in the frame B by means of the set-screw  $h$ . To enable the distance between the stop and the end of the pencil-guide to be varied to regulate the degree of sharpness of the point of the pencil or to compensate for any alteration of the position of the cutter with respect to the axis of the frame carrying it, the stop is made longitudinally adjustable by making the head  $h'$  of the pin H, against which the point of the pencil will bear, eccentric with respect to the body of the pin.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a pencil-sharpening machine, a cutter cylindrical in form and provided with helically-arranged cutting edges, a frame

adapted to carry said cutter, a guide for the pencil in the axis of said frame, means to rotate the said cutter and give it a planetary motion, and means for adjusting the position of the cutter both radially and angularly with respect to the axis of the frame carrying it.

2. In a pencil-sharpening machine a cutter cylindrical in form and provided with helically-arranged cutting edges, a frame adapted to carry said cutter, a guide for the pencil in the axis of said frame, a stop for limiting the longitudinal movement of the pencil mounted in the said frame so as to be adjustable both radially and longitudinally and means to rotate the said cutter and give it a planetary motion.

3. In a pencil-sharpening machine a cutter cylindrical in form and provided with helically-arranged cutting edges, a frame adapted to carry said cutter, means to rotate the said cutter and give it a planetary motion a guide for the pencil in the axis of said frame, an adjustable stop carried by said frame to limit the longitudinal movement of the pencil, and means for adjusting the position of the cutter radially with respect to the axis of the frame carrying it.

4. In a pencil-sharpening machine a cutter cylindrical in form and provided with helically-arranged cutting edges, means to rotate said cutter so that the said helically-arranged cutting edges cut from the body part of the pencil toward the point thereof, means to impart a planetary motion to said cutter, a stepped guide for the pencil in the axis of the frame carrying said cutter, and means for adjusting the cutter radially with respect to the axis of the frame carrying it.

5. In a pencil-sharpening machine a cutter cylindrical in form and provided with helically-arranged cutting edges, means to rotate said cutter so that the said helically-arranged cutting edges cut from the body part of the pencil toward the point thereof, means to impart a planetary motion to said cutter, a stepped guide for the pencil in the axis of the frame carrying the cutter, and an adjustable stop carried by the frame to limit the longitudinal movement of the pencil.

6. In a pencil-sharpening machine a cutter cylindrical in form and provided with helically-arranged cutting edges, means to rotate said cutter so that the said helically-arranged cutting edges cut from the body part of the pencil toward the point thereof, means to impart a planetary motion to said cutter, a stepped guide for the pencil in the axis of the frame carrying the cutter, an adjustable stop carried by the frame to limit the longitudinal movement of the pencil, and means for adjusting the cutter radially with respect to the axis of the frame carrying it.

7. In a pencil-sharpening machine a cutter cylindrical in form and having helically-ar-



5 ranged cutting edges, a frame mounted to rotate in a stand or casing and carrying the cutter at an angle with the axis about which said frame rotates, a guide for the pencil in the axis of said frame, means to rotate the said cutter and give it a planetary motion, and means to adjust the cutter with respect to the axis of the frame carrying it.

8. In a pencil-sharpening machine a cutter 10 cylindrical in form and having helically-arranged cutting edges, a frame mounted to rotate in a stand or casing and carrying the cutter at an angle with the axis about which said frame rotates, a guide for the pencil in the axis of said frame, an adjustable stop in the frame to limit the longitudinal movement of the pencil, and means to rotate the said cutter and give it a planetary motion.

9. In a pencil-sharpening machine a cutter 20 cylindrical in form and having helically-arranged cutting edges, a frame mounted to rotate in a stand or casing and carrying the cutter at an angle with the axis about which said frame rotates, a guide for the pencil in the axis of said frame, an adjustable stop in the frame to limit the longitudinal movement of the pencil, means to rotate the said cutter, and give it a planetary motion, and means to adjust the cutter radially with respect to the 30 axis of the frame carrying it.

10. In a pencil-sharpening machine the combination of a rotary device provided with helically-arranged cutting edges, means for imparting both a rotary and planetary motion thereto, and of an adjustable stop carried by the frame to limit the longitudinal movement of the pencil.

11. In a pencil-sharpening machine the combination of a rotary device provided with 40 helically-arranged cutting edges, means for imparting both a rotary and planetary motion thereto, means for radially adjusting the position of the cutter, and of an adjustable stop to limit the longitudinal movement of the pencil.

12. A pencil-sharpening machine having means for holding the pencil comprising a detachable bush mounted in the axis of the frame carrying the cutter, the diameter of the inner end of said bush being less than that of the outer end.

13. In a pencil-sharpening machine the combination of a single cylindrical cutter having helically-arranged cutting edges, 55 means for imparting both a rotary and a planetary motion to said cutter, a stepped guide for holding the pencil, an adjustable stop to limit the longitudinal motion of the pencil,

and means for varying the position of the axis of the cutter with respect to the axis about which planetary motion takes place.

14. In a pencil-sharpening machine, a stand or casing provided with a rotating frame, a cylindrical cutter with helically-arranged cutting edges mounted to rotate in said frame at an angle with the axis of said frame, means for rotating the cutter in the frame, and for giving a planetary motion to said frame, a stepped guide for the pencil in the axis of said frame, and means for adjusting the position of the axis of the cutter with respect to the axis of the frame carrying it.

15. In a pencil-sharpening machine a stand or casing provided with a rotating frame, a cylindrical cutter with helically-arranged cutting edges mounted to rotate in said frame at an angle with the axis of said frame, means for rotating the cutter in the frame, and for giving a planetary motion to said frame, a stepped guide for the pencil in the axis of said frame, and an adjustable stop carried by said frame for limiting the longitudinal movement of the pencil.

16. In a pencil-sharpening machine a stand or casing provided with a rotating frame, a cylindrical cutter with helically-arranged cutting edges mounted to rotate in said frame at an angle with the axis of said frame, means for rotating the cutter in the frame, and for giving a planetary motion to said frame, a stepped guide for the pencil in the axis of the frame, an adjustable stop in said frame for limiting the longitudinal movement of the pencil, and means for adjusting the position of the cutter with respect to the axis of the frame carrying it.

17. In a pencil-sharpening machine, the stand or casing A, the internal gear-wheel F fixed therein, the revoluble frame B mounted in bearings in said stand or casing, the cylindrical cutter D carried in said revoluble frame at an angle with the axis thereof, means for varying the angle of the cutter with respect to the axis of said frame, the pinion E carried by said cutter meshing with the stationary gear-wheel F, the axially-arranged pencil-guide in the revoluble frame, the adjustable stop H mounted in the frame B, and means for imparting rotary motion to said cutter and planetary motion to said frame, as set forth.

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Witnesses:

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