

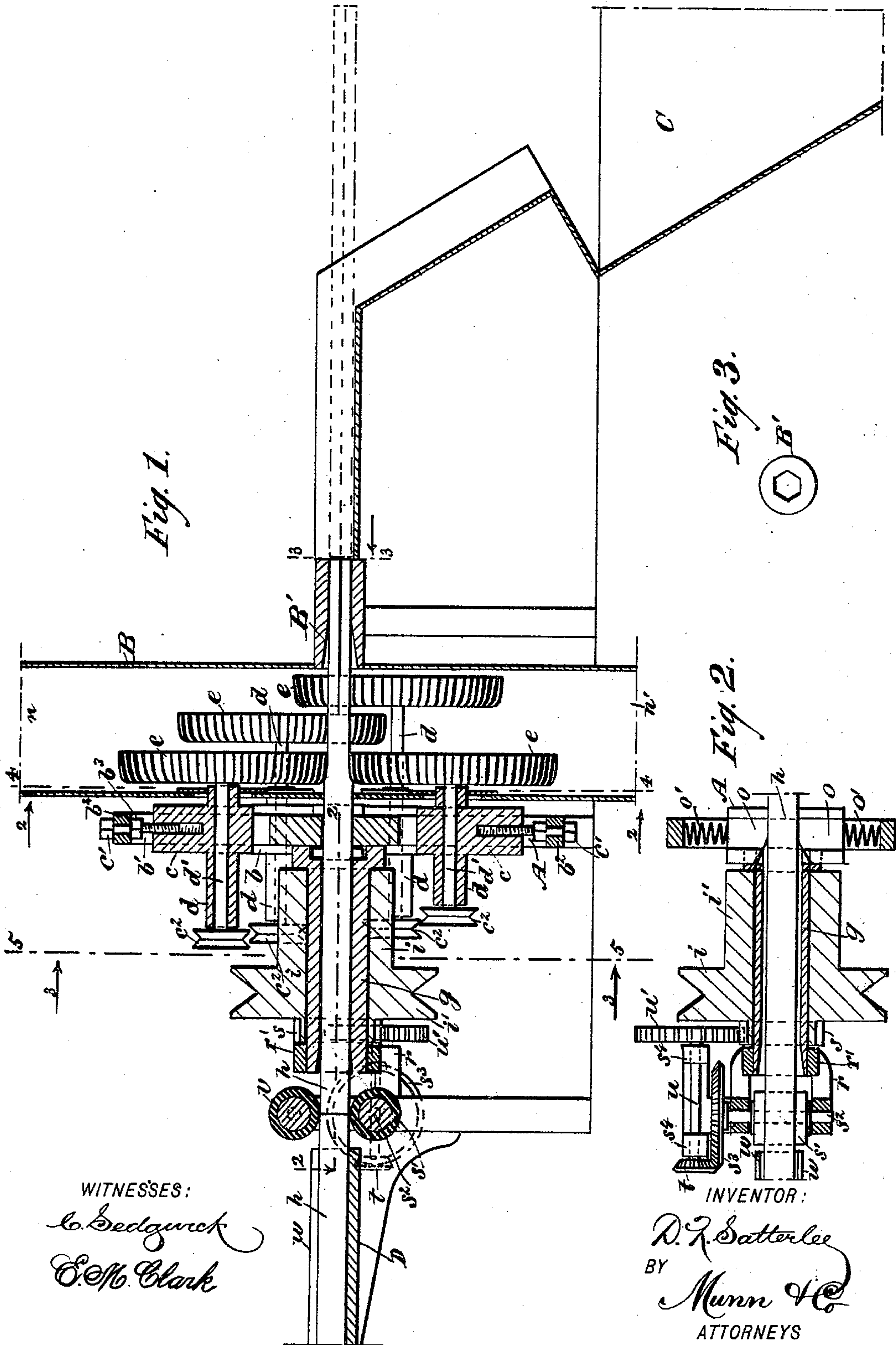
(No Model.)

2 Sheets—Sheet 1.

D. R. SATTERLEE.
MACHINE FOR FORMING SLATE PENCILS.

No. 459,655.

Patented Sept. 15, 1891.



WITNESSES:
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E. M. Clark

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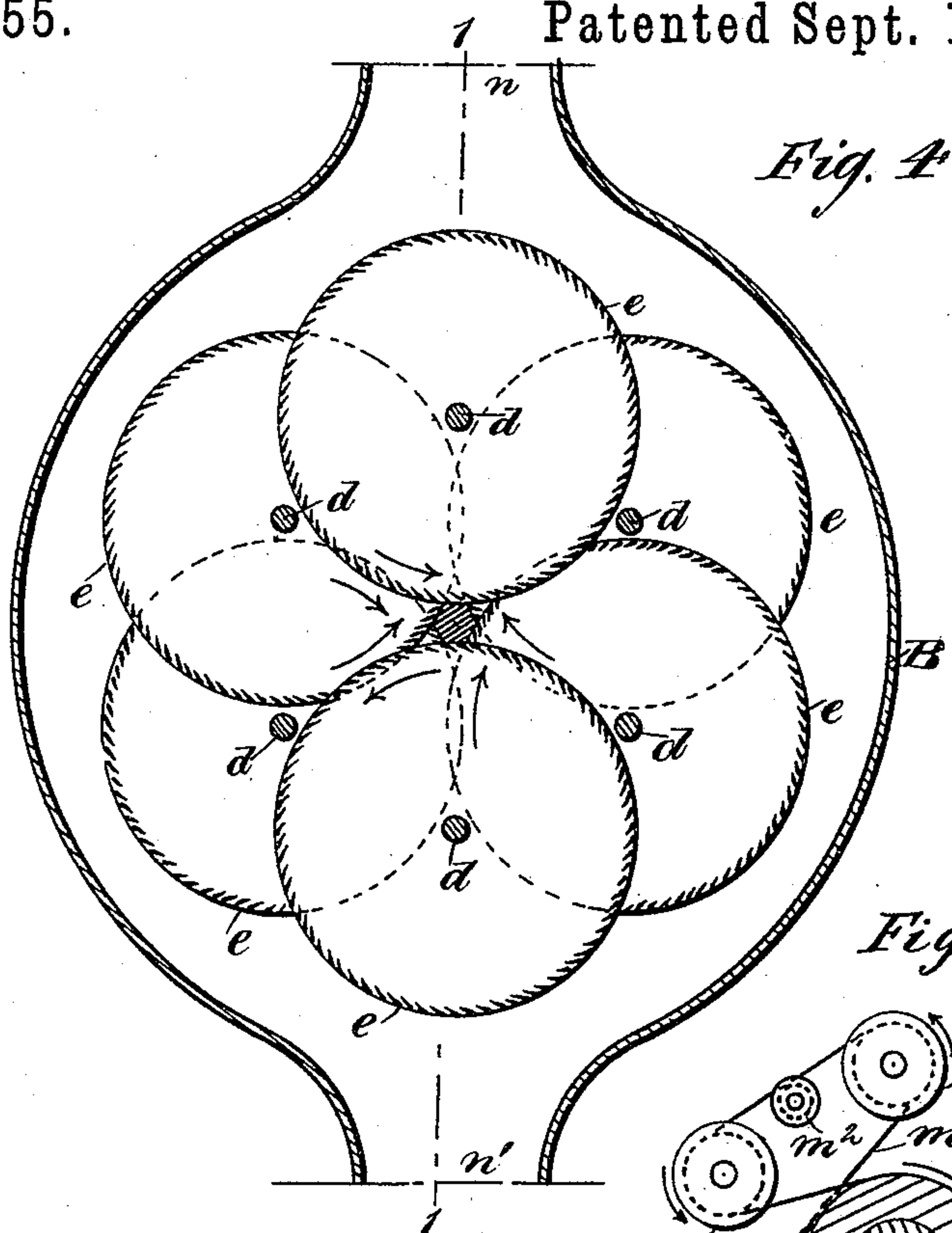


Fig. 4

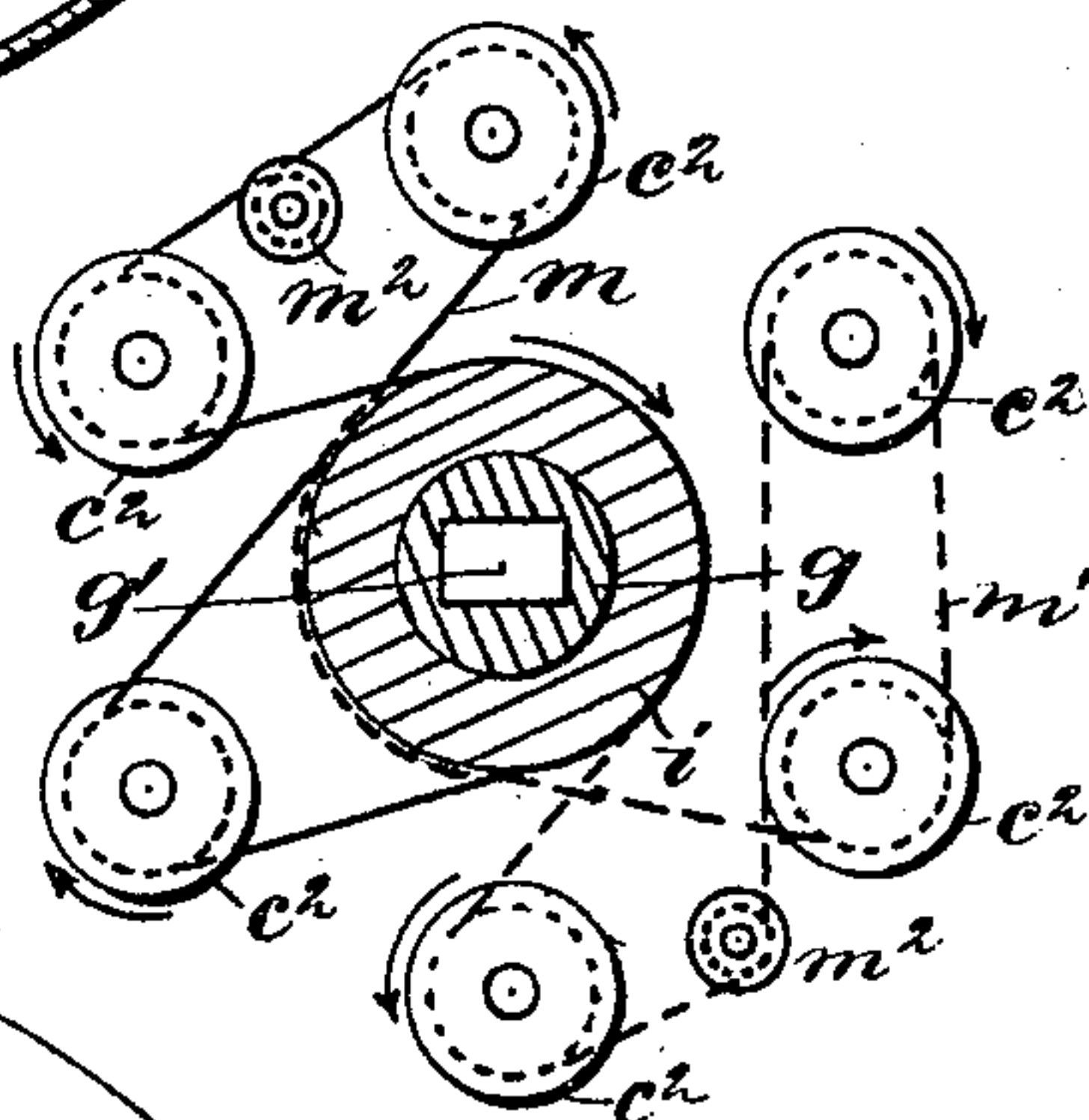
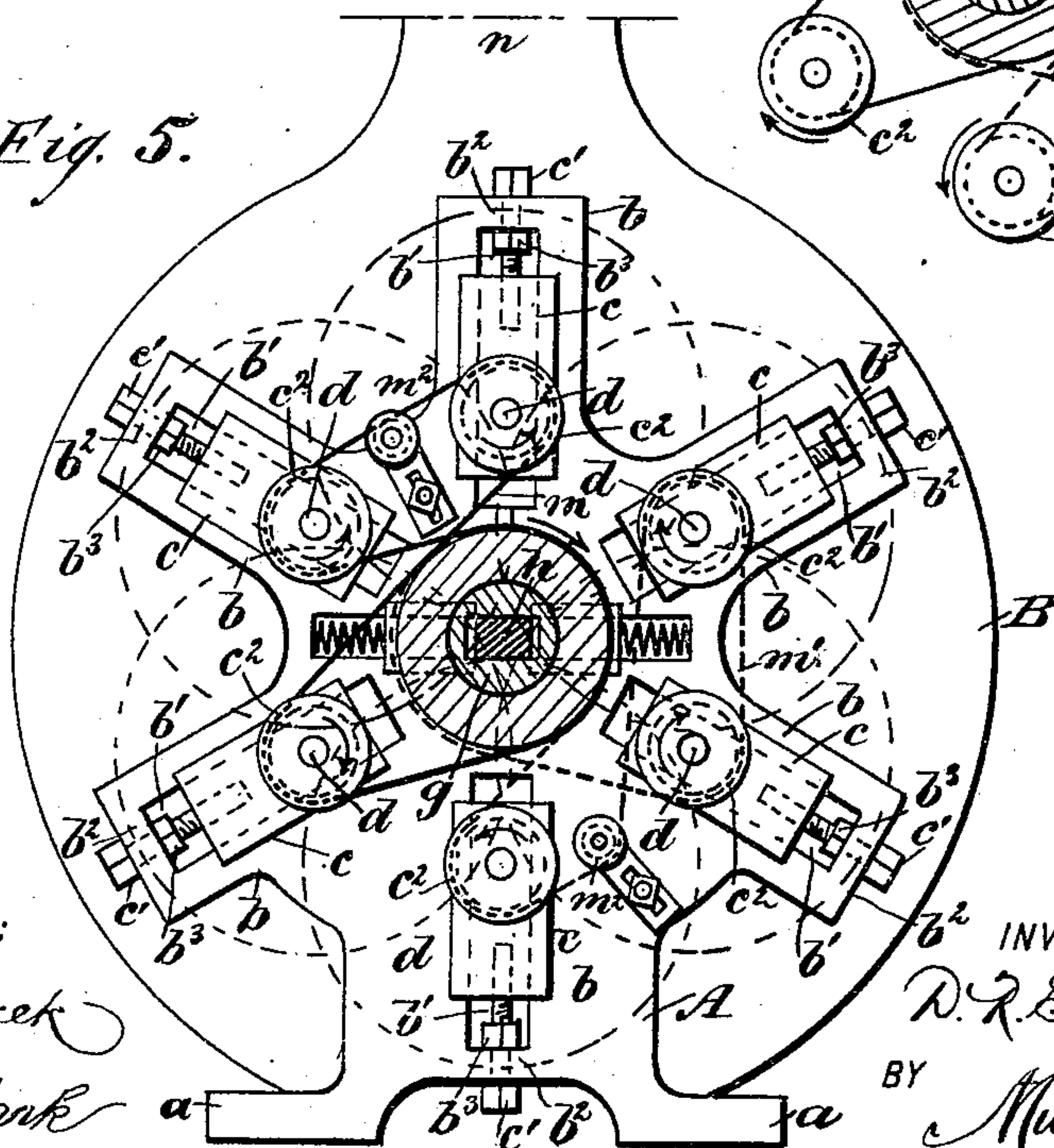


Fig. 6.

Fig. 5.



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DOUGLASS R. SATTERLEE, OF NEW YORK, N. Y.

MACHINE FOR FORMING SLATE-PENCILS.

SPECIFICATION forming part of Letters Patent No. 459,655, dated September 15, 1891.

Application filed May 27, 1891. Serial No. 394,332. (No model.)

To all whom it may concern:

Be it known that I, DOUGLASS R. SATTERLEE, of New York city, in the county and State of New York, have invented a new and useful
5 Improvement in Machines for Forming Slate-Pencils, of which the following is a full, clear, and exact description.

This invention relates to the production of slate-pencils from hard argillaceous material, such as soapstone or slate, and has for
10 its objects to provide a simple, compact, and efficient device which will afford means to form polygonally-shaped slate-pencils from strips of the material named in a rapid and
15 perfect manner.

To these ends my invention consists in the construction and combination of parts, as is hereinafter described and claimed.

Reference is to be had to the accompanying
20 drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of the machine, taken on the broken line 1 1 in Fig. 4. Fig. 2 is a sectional plan view of the forward portion of the device shown in Fig. 1,
25 taken on the line 2 2 in said figure. Fig. 3 is a transverse section of the pencil-delivery tube, taken on the line 3 3 in Fig. 1. Fig. 4 is a transverse section taken on the line 4 4 in Fig. 1. Fig. 5 is a cross-section on the line 5 5 in Fig. 1; and Fig. 6 is a diagram of the driving-wheels for the cutters, showing their
30 relative position and belts thereon and the direction of their rotary movement by arrows.

The frame A, which sustains the other portions of the machine, consists of a plate of proper thickness, having foot-pieces *a*, which
40 are laterally extended from the lower end of the plate and afford a base by which the structure is secured on a stable foundation of any preferred form. There are a proper number of radial projections or wings *b* formed on the frame-plate A at regular intervals, which
45 wings are longitudinally apertured to receive slide-blocks *c* and allow the latter to move outwardly from a common center of the plate, any suitable provision being made to retain the blocks engaged with the elongated rectangular
50 apertures *b'* of the wings. Each of the slide-blocks *c* is perforated and threaded longitudinally to receive an adjusting-screw

c', said screw being rotatably secured in the outer cross-bars *b²* of the wings *b*, and thus adapted to graduate the inward or outward
55 movement of the slide-blocks, such adjustments being retained by the jam-nuts *b³* that are located on the screws, so as to engage the cross-bars of the frame-wings.

As it is intended to produce slate-pencils of
60 a polygonal form in cross-section that may have any desired number of sides, it is essential that provision be made in the formation of the frame A and cutting devices supported by said frame to adapt the latter to suit the
65 particular shape required for the pencils produced by their use, and as the slate-pencils are preferably given a hexagonal form in cross-section the frame A is constructed with such a number of guide-wings and slide-blocks
70 therein as will accommodate the proper number of cutters to produce six-sided pencils.

At opposite points on each of the slide-blocks *c* projecting centrally-apertured hubs
75 *d* are formed, which are loosely engaged by the spindles *d'*, the latter named affording rotatable support for the cutter-disks *e*, all on the same side of the frame-plate A, and as it is essential for the efficient action of the
80 cutters that their edges be adapted to have contact with a pencil-blank transversely of the same, so as to reduce it to hexagonal form, they are arranged to cut the blank oppositely in pairs, each pair lying in the same
85 plane and parallel to the planes of the other two pairs of cutters, as will be further mentioned.

On the front side of the machine or side where the blanks are fed in to produce pencils an exterior cylindrical sleeve *g* is secured
90 upon the frame-plate A centrally, so as to project forwardly at a right angle thereto and consequently parallel with the plane of each spindle *d*, longitudinally considered. The sleeve *g* is perforated lengthwise, its apertures being rectangular in cross-section
95 (shown at *g'* in Fig. 6) and of such relative dimensions as will permit the free passage through it of the slate-pencil blanks *h*, which latter are preferably sawed from slabs of material into four-cornered strips, a suitably-shaped hole being formed in the plate A for the passage of these blanks through it also.

Upon the true cylindrical surface of the

sleeve *g*, which is essentially a portion of the machine-frame, a drum *i* is loosely mounted, the latter having a radial circular enlargement *i'* formed or secured on one end portion of its body, which is grooved peripherally to receive a driving-band, (not shown,) and thus be adapted to transmit motion and power from any adequate motor to drive the cutter.

In order to connect the spindles *d* with the driving-drum *i* there is a grooved pulley *c*², affixed to the end of each spindle that is forwardly extended, so that two bands *m m'* may be placed on the pulleys and drum, as shown in the diagram, Fig. 6, and also in Fig. 5.

As it is desirable to cause the cutters *e* to rotate in different directions, and thus avoid torsional strain on the pencil-blank while it is receiving the impingement of the cutters, the spindles supporting the latter are connected in two series of groups, one group being engaged by the endless band *m* and the other group by the similar band *m'*, which bands pass partly around the drum *i*, having contact therewith oppositely and aside of each other, and thence are extended around the pulleys partially, so as to connect each group of three pulleys with the driving-drum, the manner of revolving the belts adapting them to communicate motion to the pulleys, so that some pulleys and the cutters they rotate will revolve oppositely to other similar parts, which will prevent the pencil-blank from being twisted or broken by the action of the cutters on it, the direction of motion given to each cutter and its pulley being shown by arrows in Figs. 4 and 6.

To enable the proper tension to be given to the bands *m m'*, a radially-adjustable idler-pulley *m*² is provided for each band, which pulleys by their adjustment upon the frame-plate *A* are adapted to take up slackness in the bands and cause them to transmit motion properly from the drum *i* to all the spindles *d* and cutters *e* thereon. The cutting-disks *e* are of the same diameter and thickness, and are preferably made of steel, having their peripheral edges and forward sides near said edges serrated to afford cutting-surfaces. It is also contemplated to use cutter-wheels made of grindstone or emery; or wheels having black diamonds set in their rims or sides may be substituted for the metallic cutters. A casing *B* is provided for the inclosure of the cutters *e*, and at the upper end *n* of said casing a fan-blast may be introduced to blow out the dust resulting from the action of the cutters on the pencil-blanks, which is removed through an aperture *n'* below in the casing and thence conducted to any preferred point for discharge.

As before mentioned, the frame-plate *A* is apertured near its center for the projection of the pencil-blanks *h* successively through it, and as shown in Fig. 2 this orifice is laterally extended to afford slideways for the

support of two reciprocating centering-blocks *o*, which are pressed toward each other by a spring *o'* for each block, so that the inner ends of the blocks *o* will be caused to bear upon the opposite edges of a slate-pencil blank when the latter is pushed through the sleeve *g* toward the cutters *e*, and thus center the blank and laterally support it when its end portion is engaged by the cutters. The center portion of the casing *B* is apertured and provided with a guide-tube *B'*, which aligns with the sleeve *g* and is longitudinally perforated, the passage through said tube being hexagonal and of such a proportionate diameter as will allow the sliding movement therein of the completed portion of the pencil, which is thereby sustained, as the action of the cutters *e* removes surplus material and gives a hexagonal shape to the rectangular pencil-blank. Preferably there is such a sufficient extension of the guide-tube *B'* afforded as will conduct the finished pencils away from the machine and drop them into any proper receptacle *C*, said guide-tube having a support from the same base as that whereon the frame-plate *A* is sustained.

The unfinished pencil-blanks may be pushed into the front end of the sleeve *g*, if desired, and by continuous pressure applied on the end be manually forced through the machine; but it is of advantage to feed the blanks into said sleeve by the same power that actuates the cutters *e*. To this end the sleeve *g* is forwardly projected a sufficient distance to support the pinion *s*, that is attached rigidly to the front end of the drum *i* concentrically, and also sustain the adjacent end of a bracket-frame *r*, whereon a ferrule *r'* is formed that encircles and is secured upon the projecting portion of the sleeve, as indicated in Figs. 1 and 2, the bracket-frame supporting loosely a transverse gum-incased roller *s'*, that is affixed upon a cross-shaft *s*², which is journaled in the bracket-frame and projects on one side of the latter sufficiently to receive a bevel gear-wheel *s*³, that is secured thereon.

On a portion of the bracket-frame *r*, which is laterally-extended outside of the bevel-wheel *s*³, two box-bearings *s*⁴ are formed, which receive and rotatably sustain a shaft *u* at right angles to the shaft *s*², there being a bevel-pinion *t* affixed on the forward end of the shaft *u*, which meshes with the gear-wheel *s*³, and on the opposite end of this shaft a spur-wheel *u'* is secured that is in gear with the pinion *s*. As the spur-wheel *u'* is made larger in diameter than the pinion *s* and the bevel-wheel *s*³ larger than the bevel-pinion *t* it is evident that the rate of rotative motion transmitted from the drum *i* to the roller *s'* will be considerably reduced, the rate of reduction being so proportioned that a proper progressive movement will be communicated to the blank *h* when this is caused to enter between the driving-roller *s'* and a similar pressure-roller *v*, which latter is rotatably mounted

above the driving-roller, so as to impinge on the upper surface of a pencil-blank when it is inserted between the rollers.

To facilitate the feeding of blanks *h* longitudinally between the feeding-rollers *s' v*, a table *D* is located on an upright frame near to these rollers, said table having two parallel guide-walls *w* along the edges, which will direct the blanks as they are fed successively between the rollers.

In operation the introduction of a pencil-blank between the feeding-rollers of the machine when in motion will cause the end of the blank first inserted to be projected through the frame-plate *A*, between the centering-blocks *o*, and thence between the cutters *e*, and as the latter so overlap each other in pairs as to dispose the nearest portions of their moving edges to cut hexagonally when they are rotated, as indicated in Fig. 4, it is apparent that the production of finished slate-pencils in hexagonal form can be rapidly and perfectly effected in the machine herein described.

Should it be desired to form pencils having a greater or less number of sides, the machine can be so constructed that a less or greater number of cutter-disks may be utilized, the other parts being altered in an obvious manner to conform with the number of cutters employed.

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

1. The combination, with the frame provided with a longitudinally-extending guide-passage for the blank, of cutting-wheels having said passage for their common center to impart a polygonal contour to the blank, substantially as shown and described.

2. A slate-pencil-forming machine having a series of pairs of cutting-wheels grouped around a common center to permit the passage of the pencil-blank, the wheels of each pair being in the same plane and the pairs of wheels being parallel, substantially as shown and described.

3. A slate-pencil-forming machine having a series of pairs of cutting-wheels grouped around a common center to permit the passage of the pencil-blank, the wheels of each pair being in the same plane and the pairs of wheels being parallel, and gearing rotating

the wheels of each pair oppositely to relieve the blank from torsional strain, substantially as shown and described.

4. A slate-pencil-forming machine comprising the frame having a plate apertured for the passage of the pencil-blanks, sliding centering-blocks in said apertures, a sleeve having a polygonal passage aligning said aperture at one side of the plate, and a series of cutting-wheels journaled at the opposite side of said plate and having said aperture for their common center, substantially as shown and described.

5. A pencil-forming machine comprising the frame having a plate apertured for the passage of the pencil-blank, longitudinally-aligned sleeves the bores of which form guides for the blank and shaped pencil, respectively, and a series of pairs of cutting-wheels between said sleeves and grouped around their apertures for their common centers, substantially as shown and described.

6. In a slate-pencil-forming machine, the combination, with a supporting-frame, cutting-wheels in disk form radially adjustable on the frame, all adapted to rotate simultaneously and cut a blank polygonally as it is moved between their nearest peripheral portions, and means for adjusting the wheels toward a common center of the frame, of a device for revolving the cutting-wheels and a device for feeding the pencil-blanks to the machine, substantially as described.

7. In a slate-pencil-forming machine, the combination, with an upright frame-plate having sliding blocks radially adjustable on its front, spindles rotatably supported by said blocks at right angles to the frame-plate, and cutting-wheels on said spindles, of a central sleeve on the frame-plate adapted to receive a pencil-blank and guide it to the cutting-wheels, a drum rotatably secured on the sleeve, having a toothed pinion on its outer end, a pulley on each spindle, two endless belts on the drum and pulleys, a feeding-gearing for the pencil-blanks meshed with the pinion on the drum, and a casing for the cutting-wheels, substantially as described.

DOUGLASS R. SATTERLEE.

Witnesses:

F. S. HYATT,
DAVID HURTACE.