

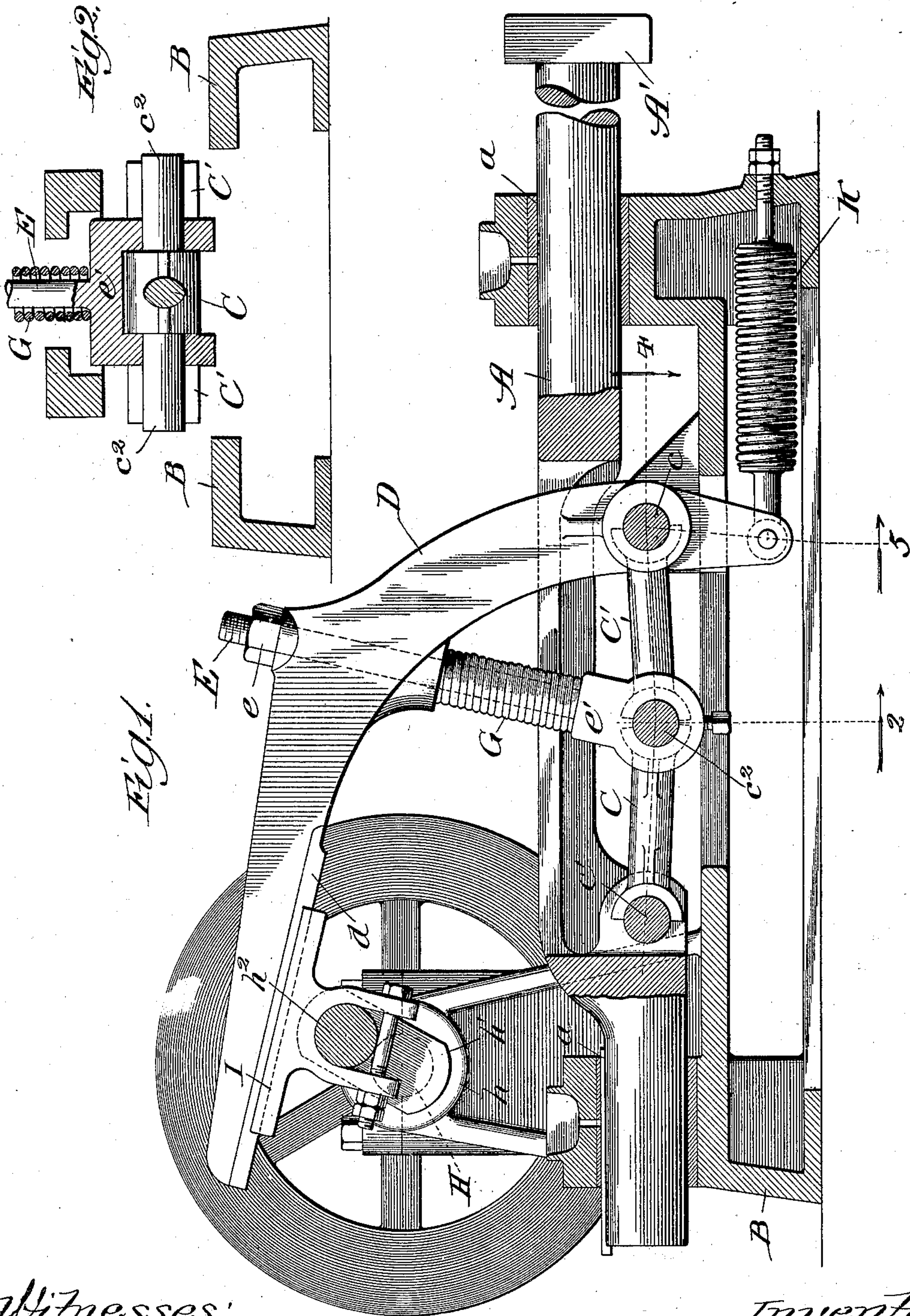
D. COLE.

ACTUATING MECHANISM FOR CONCENTRATING TABLES.

(Application filed July 20, 1899.)

(No Model.)

2 Sheets—Sheet 1.



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No. 653,285.

Patented July 10, 1900.

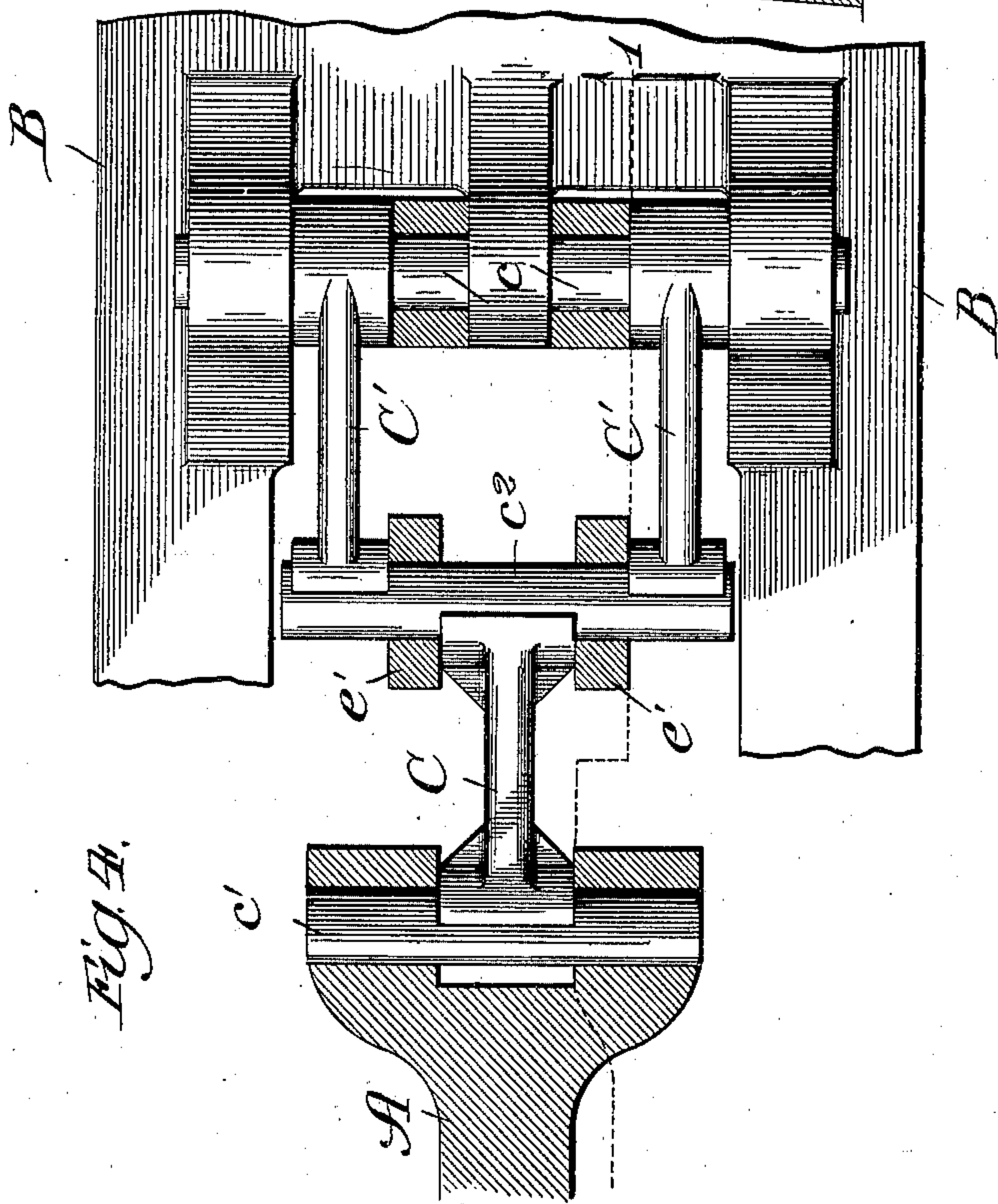
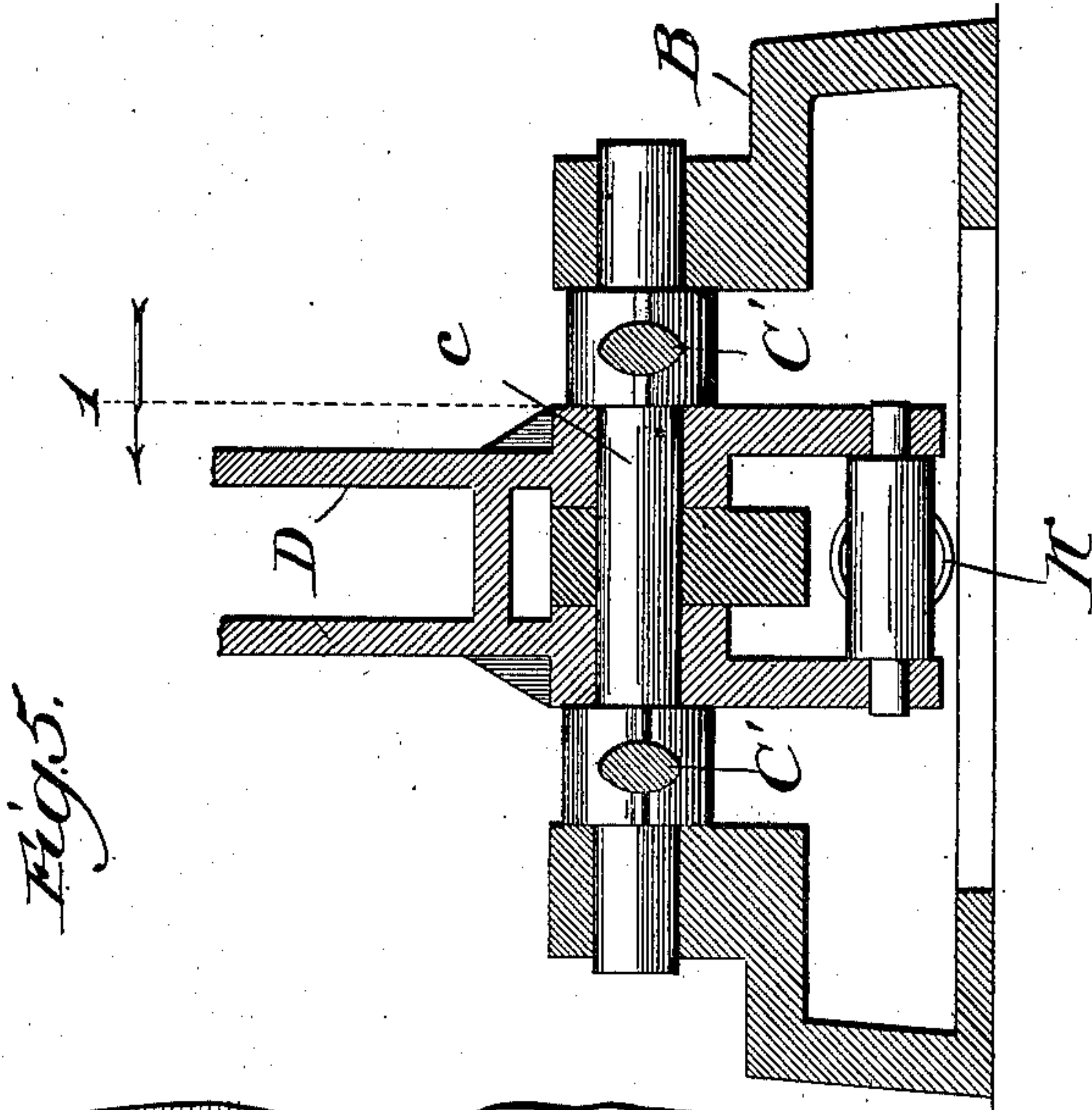
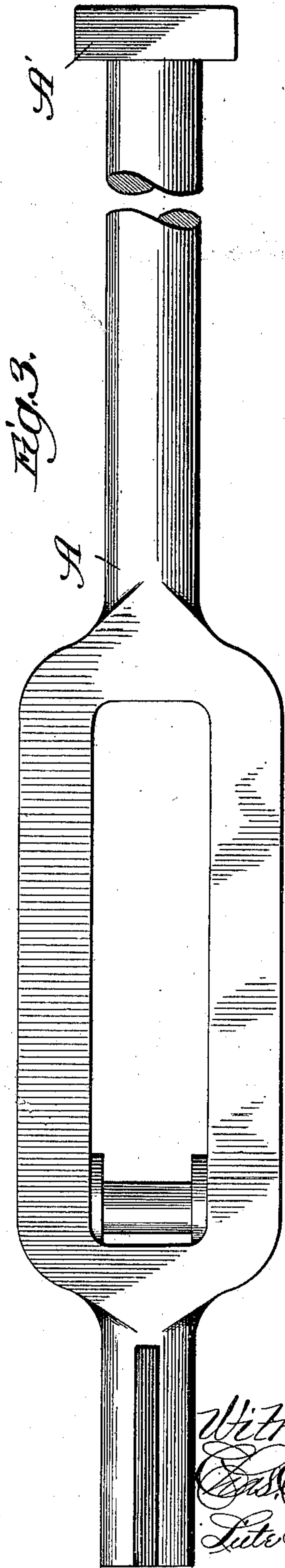
D. COLE.

ACTUATING MECHANISM FOR CONCENTRATING TABLES.

(Application filed July 20, 1899.)

(No Model.)

2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

DAVID COLE, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE GATES IRON WORKS,
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ACTUATING MECHANISM FOR CONCENTRATING-TABLES.

SPECIFICATION forming part of Letters Patent No. 653,285, dated July 10, 1900.

Application filed July 20, 1899. Serial No. 724,518. (No model.)

To all whom it may concern:

Be it known that I, DAVID COLE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have
5 invented certain new and useful Improvements in Actuating Mechanism for Concentrating-Tables, of which the following is a specification.

My invention relates to that class of mechanisms which are used for the purpose of concentrating precious metals and in which there is a table on which the material to be concentrated is flowed. The machines are further provided with mechanisms by which the table is vibrated in a plane practically coincident with its concentrating-surface, and it is to this portion of the mechanism that my invention particularly relates.

The principal object of my invention is to provide a concentrating-table with simple, economical, and efficient mechanism for vibrating the same; and the invention consists in the features, combinations, and details of construction hereinafter described and
25 claimed.

In the accompanying drawings, Figure 1 is a longitudinal sectional elevation taken through my improvements on the line 1 of Fig. 5 looking in the direction of the arrow; Fig. 2, a cross-sectional view showing a portion of the mechanism and taken on the line 2 of Fig. 1; Fig. 3, a broken plan view of the sliding bar; Fig. 4, a plan detail, partly in section, taken on the line 4 of Fig. 1 looking in the direction of the arrow, and Fig. 5 a similar view taken on the line 5 of Fig. 1 looking in the direction of the arrow.

In illustrating and describing my improvements I have illustrated and described that which I consider to be new, taken in connection with so much as is old, as will properly disclose the invention and enable those skilled in the art to practice the same, leaving out of consideration other and well-known elements which if illustrated and described here
45 would only tend to prolixity, confusion, and ambiguity.

In constructing my improvements and using them in connection with a concentrating-table I provide a reciprocating bar A, which is slidingly mounted in suitable bearings a

in the frame portion B. This reciprocating bar at one end is provided with a head portion A', adapted to be secured in the usual manner to the vibratable concentrating-table, and is kept at one limit of its motion by means of the usual springs, the table and springs not being illustrated or described in this specification any further than given above.

In order to impart the necessary rectilinear movements to the reciprocating bar, a pair of pivotally-connected toggle-links C and C' are provided, one fulcrumed at one end at c on the base portion and the other at the other end to fulcrum c' on the reciprocating bar, so that during the vibrations of the toggle-levers the said bar is moved backwardly and forwardly in a rectilinear path, so as to vibrate the concentrating-table. In the old art it is usual to vibrate these toggle-links by means of a pitman rigidly connected with the wrist-pin of a crank-shaft. There are various objections to this style of mechanism in that it is necessary in order to take up all lost motion and to operate the toggle-links sufficiently as they approach a horizontal plane that the springs on the concentrating-table should be of great tension, so much so that the fulcrum-pivots wear quite rapidly. It is, therefore, highly desirable that some simple and efficient means should be devised in which these high-tension springs can be dispensed with and all the efficiency thereof remain in the mechanism. In order to accomplish this result and overcome the objections above noted, I provide what I term an "operating-lever" D and preferably pivotally mount it upon the base at the fulcrum c, as shown particularly in Fig. 1. This operating-lever is connected with the pivot connection c² of the toggle-links by means of the connecting-rod or pitman E, which has its outer free end threaded, so as to be engaged by an adjusting-nut e. This pitman passes through a smooth perforation in the operating-lever, and between its shoulder e' and the operating-lever is inserted an extensible spring-washer G, the purpose of which is to form an adjustment of the relation between the pitman and the operating-lever, but to prevent such adjustment bringing the toggle-links into a substantially-hori-
100

zontal plane—that is, so that the axes of all the fulcrum-points should lie in one plane. If the alinement of the axes in one horizontal plane should happen, it would minimize the action of the springs of the concentrating-table and require much heavier secondary springs, as will be more fully hereinafter described. The above arrangement, however, prevents this action.

10 In order to vibrate the operating-lever, and thereby give the necessary movements to the concentrating-table, a crank-shaft H is provided, mounted in a suitable block h, and which is provided with a crank-plate h', carrying the crank-pin h². Pivottally mounted upon this crank-pin is a shoe I, having its saddle portion engaging with a slide d on the operating-lever, the arrangement being such that during the rotations of the wrist-pin and 20 in its downward path a supplementary spring K, which is secured to the operating-lever and frame, vibrates the free end of the operating-lever downwardly, and thus forces the pivot connection of the toggle-link downwardly and 25 permits the main spring on the concentrating-table to vibrate the mechanisms in one direction. During the rotation of the wrist-pin in its upward path the free end of the operating-lever is moved oppositely and against the tension of both main and supplementary springs 30 and acting through its pitman raises the pivot connection of the toggle-link and moves the reciprocating bar backwardly, thus vibrating the concentrating-table against the tension of its main springs. This construction is such that main springs of the least tension can be used on the concentrating-table and merely to move it in one direction, the supplementary spring or springs K being of sufficient tension to vibrate the operating-rod and assist 40 in the vibration of the toggle-links.

I claim—

1. The combination of a base or frame, a sliding bar having bearing therein, a pair of 45 pivottally-connected toggle-links, one pivoted at one end to said bar and the other pivoted at the opposite end to the base, an operating-lever pivoted at its outer end to the base on the same line with the link last mentioned, 50 and pivottally connected at another point with the pivot connection of the toggles, a spring for forcing said lever in one direction, and an actuating crank-shaft connected with said lever to vibrate the same, substantially as described. 55

2. In mechanisms of the class described, a reciprocating bar, a frame or base portion in which it is slidingly mounted, pivottally-connected toggle-links one fulcrumed at one end 60 on the base and the other at the other end to the reciprocating bar, an operating-lever fulcrumed on the base portion, a pitman connected with said lever and engaging the pivot connection of the toggle-links, a spring for assisting in moving the operating-lever in one direction, a crank-shaft and pin connect- 65 ed with the free end of the operating-lever to

vibrate the same by and during its rotations, substantially as described.

3. In mechanisms of the class described, a 70 reciprocating bar, a base portion in which it is slidingly mounted, pivottally-connected toggle-links one fulcrumed at one end on the base portion and the other at the other end to the reciprocating bar, an operating-lever 75 pivoted on the base portion, a pitman pivottally secured to the central pivot connection of the toggle-links and adjustably secured to the operating-lever, a spring connected with the operating-lever to assist in vibrating it in one direction, and a crank-shaft and crank 80 connected with the free end of the operating-lever to vibrate the same, substantially as described.

4. In mechanisms of the class described, 85 the combination of a reciprocating bar, a base portion in which it is slidingly mounted, pivottally-connected toggle-links one fulcrumed at one end upon the base portion and the other 90 at the other end to the reciprocating bar, and arranged to reciprocate the said bar by and during their vibrations, an operating-lever fulcrumed upon the base portion, a pitman pivottally secured to the pivot connection of the toggle-links and having a threaded end 95 passed through a smooth perforation in the operating-lever, an adjusting-nut on its outer end, an expansible washer inserted between the operating-lever and the pitman, a spring secured to the operating-lever and to the base 100 portion to assist in vibrating it in one direction, a crank-shaft and crank rotatably mounted on the frame portion, and a shoe pivottally mounted on the crank and having a sliding engagement with the free end of the 105 operating-lever to vibrate the same by and during the rotation of the crank-shaft, substantially as described.

5. In a machine of the class described, the combination of a reciprocating bar, a frame or 110 base portion in which the said bar is reciprocatingly mounted, pivottally-connected toggle-links one fulcrumed at one end upon the base portion and the other at the other end to the reciprocating bar to reciprocate the same 115 by and during their vibrations, an operating-lever pivottally mounted upon the frame portion at one fulcrum-point of the toggle-links, a pitman pivottally secured to the toggle-links at the pivot connection thereof and having a 120 threaded end portion passed through a smooth perforation in the operating-lever, an adjusting-nut on the threaded outer end of the pitman, an extensible spring-washer surrounding the pitman and inserted between it 125 and the operating-lever, a crank-shaft and crank rotatably mounted in the frame portion, a shoe pivottally mounted upon the crank and having its saddle engaging with a slide on the operating-lever, and a spring secured to the operating-lever and the frame 130 portion to assist in vibrating the operating-lever in one direction, substantially as described.

6. In mechanisms of the class described, the combination of a reciprocating bar, a base portion in which it is slidably mounted, pivotally-connected toggle-links one fulcrumed
5 at one end upon the base portion and the other at the other end to the reciprocating bar and arranged to reciprocate the said bar by and through their vibrations, an operating-lever fulcrumed upon the base portion,
10 a pitman pivotally secured to the pivot connection of the toggle-links and adjustably secured to the operating-lever, a spring secured to the operating-lever and base portion to assist in vibrating the operating-lever, and a crank-shaft slidably connected with the operating-lever to operate the same, substantially as described. 15

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