

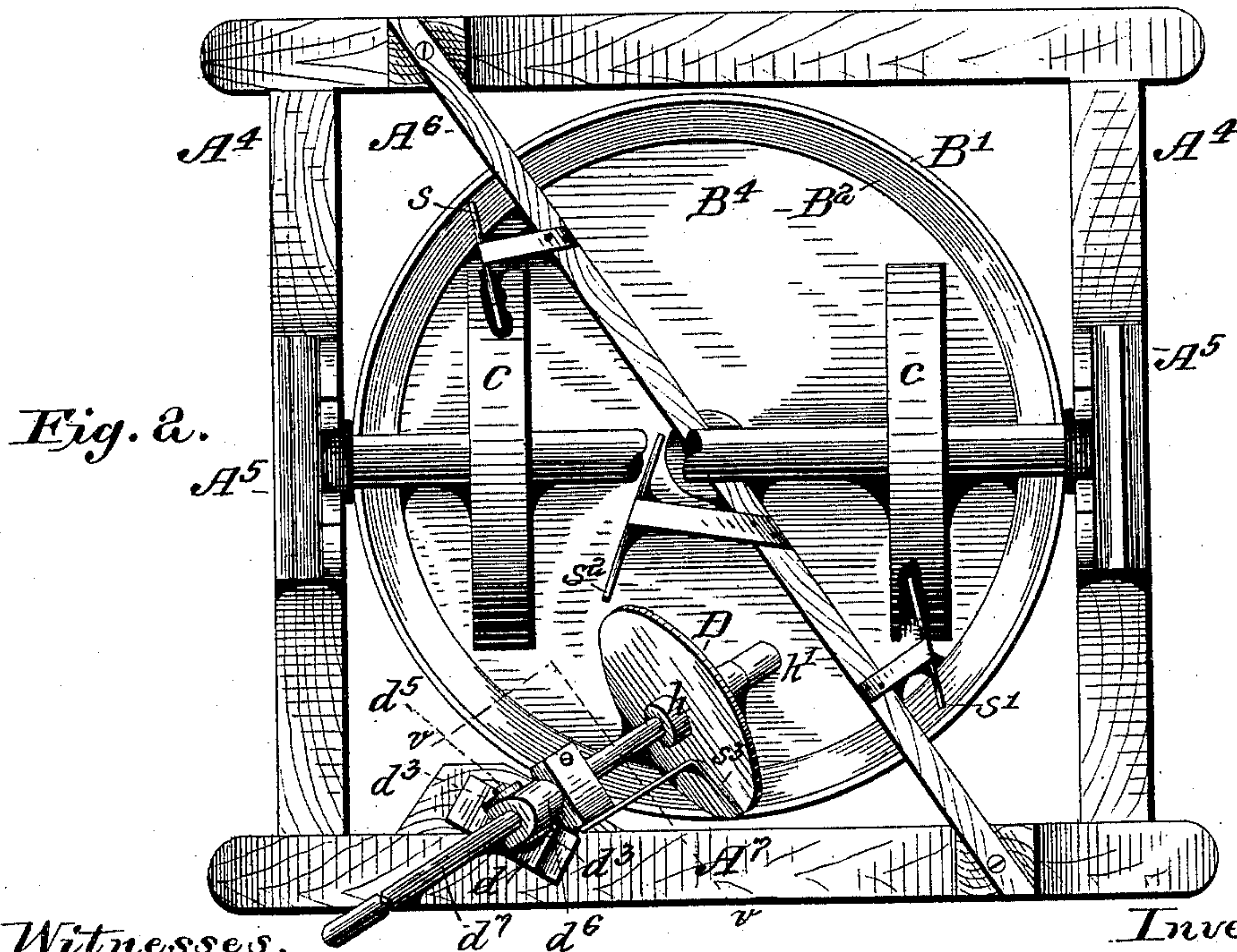
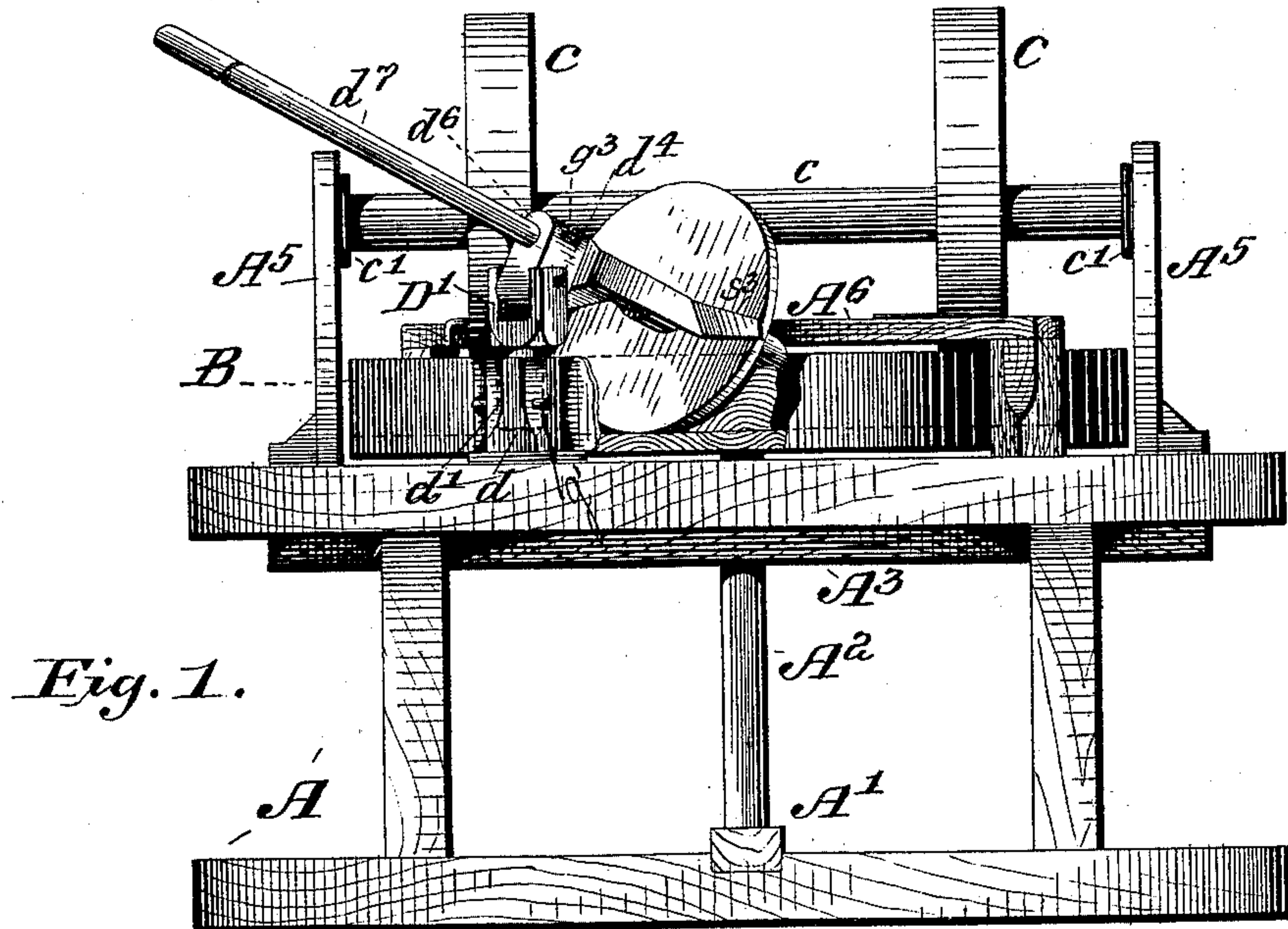
(No Model.)

2 Sheets—Sheet 1.

T. & J. CLIFFORD.
CLAY GRINDING MILL.

No. 432,602.

Patented July 22, 1890.



Witnesses.
Arthur Ashley
James F. Duhamel

Inventors:
Thomas Clifford
James Clifford
per *Arthur Ashley atty.*

(No Model.)

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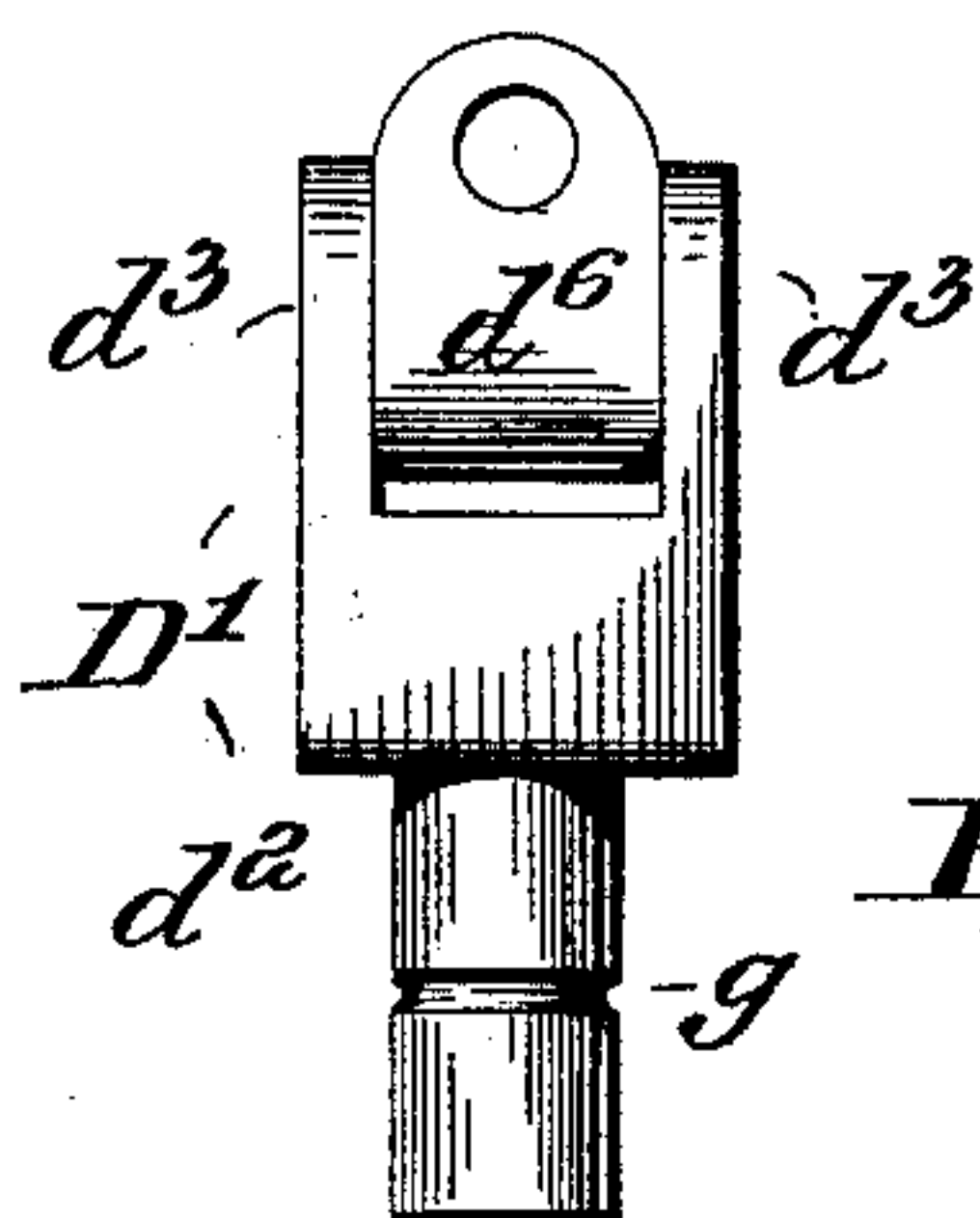


Fig. 3.

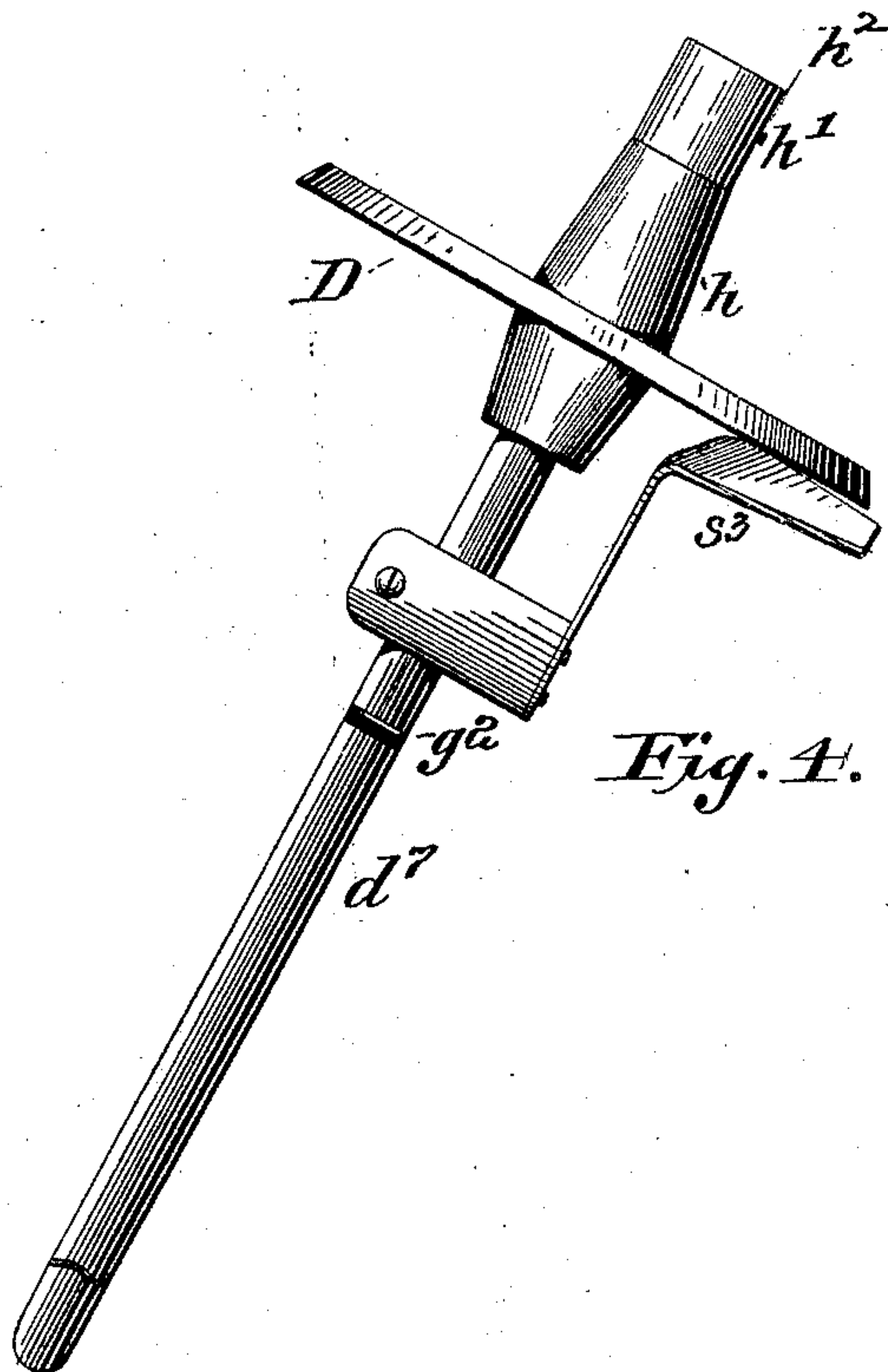


Fig. 4.

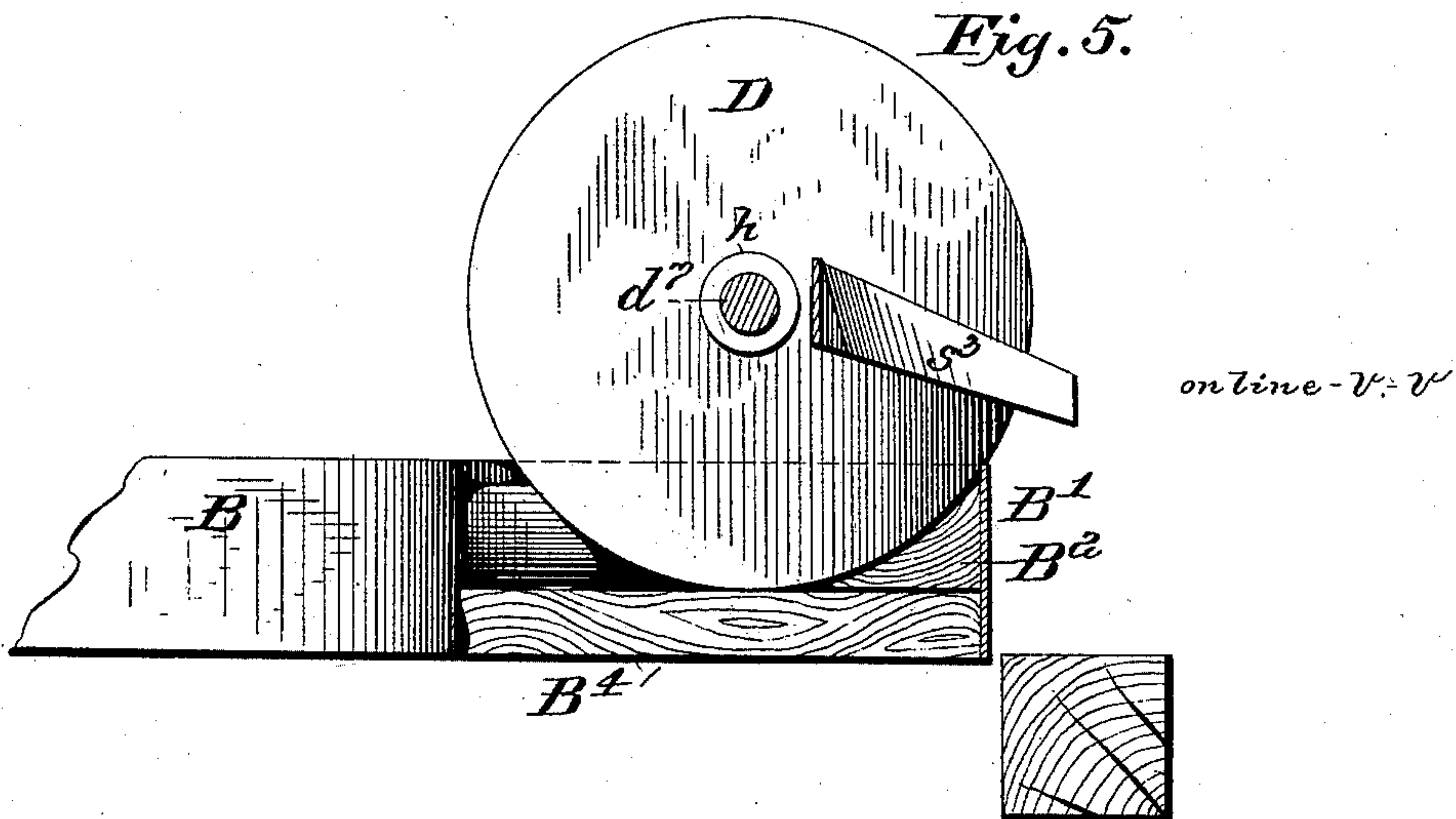


Fig. 5.

on line - V - V

Witnesses.

Arthur Ashley
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UNITED STATES PATENT OFFICE.

THOMAS CLIFFORD AND JAMES CLIFFORD, OF WEST SUPERIOR, WISCONSIN.

CLAY-GRINDING MILL.

SPECIFICATION forming part of Letters Patent No. 432,602, dated July 22, 1890.

Application filed March 7, 1890. Serial No. 342,993. (No model.)

To all whom it may concern:

Be it known that we, THOMAS CLIFFORD and JAMES CLIFFORD, citizens of the United States, and residents of West Superior, in the county of Douglas, in the State of Wisconsin, have invented a new and useful Clay-Grinding Mill, of which the following is a description.

The invention relates to grinding-mills of the class used in crushing and disintegrating lumps and masses of clay or other analogous material preparatory to molding the same into forms suitable for use in building walls or other structures of masonry, or for other purposes.

The invention consists in certain novel elements or combinations of elements in a mill of the class referred to, as will first be described in detail, and then specifically indicated in the concluding clauses of this specification.

In the drawings, Figure 1 represents a side elevation of a mill in which my improvements are embodied, portions being broken out to expose otherwise concealed parts. Fig. 2 is a partial top plan view. Fig. 3 is a view of the standard which bears the adjustable discharging-disk detached from its support. Fig. 4 is a view of the discharging-disk and its shaft detached from its bearings. Fig. 5 is a partial vertical section, as in the line *v v* in Fig. 2.

The receptacle B, commonly termed the "clay-pan," is mounted upon a supporting-frame A, the pan resting centrally upon a pivot-post A², which is stepped at its foot in a central transverse sill A', and is extended upwardly therefrom through a central sub-plate or transverse bar A³, which secures it in its perpendicular and central position. Mounted upon a transverse shaft *c*, which has bearings in blocks *c' c'*, which are movable vertically in the bifurcations of the standards A⁵ A⁵ upon the oppositely-placed plates A⁴ A⁴ of the frame, are the chasing-rollers C C, arranged in an ordinary manner obliquely to and upon opposite sides of the transverse bar A⁶. In the angle formed at the junction of the vertical wall B' and the horizontal bottom plate or floor B⁴ of the pan is fixed the continuous support or buttress B², which from its upper to its lower extremity is downwardly

and inwardly curved, as shown. Fixed upon the transverse bar A⁶, and operating in conjunction with the pan and its chasing-rollers, are the end scrapers *s* and *s'*, each curved at its outer extremity to correspond to the curvature of the pan and an intermediate scraper^s.

Mounted upon one of the plates, as A⁷, of the supporting-frame A, is the variously-adjustable discharging-disk D. As shown in the drawings, the base *d* of the horizontally-revoluble standard D' of the disk has top, central, vertical, cylindrical opening *d'* to receive the correspondingly-rounded pivotal bottom extension *d*² of such standard. The standard terminates upwardly in a bifurcation which forms the two coincident jaws *d*³ *d*³, in the journal-bearings *d*⁴ *d*⁴ of which are received the ends of the journal or shaft *d*⁵ of the box *d*⁶, in which in turn the shaft *d*⁷ of the disk D is received. The disk is fixed directly upon a hub *h*, which loosely receives the shaft *d*⁷, the disk being secured by a suitable collar *h'* and pin *h*² or other analogous means applied upon the inner extremity of the shaft.

As seen in Fig. 3, the extension *d*² of the standard has a horizontal encircling groove *g*, which receives a securing-pin *g'*; and, as seen in Fig. 4, the shaft *d*⁷ of the disk has a like groove *g*² to receive a similar pin *g*³, to secure such shaft in its proper adjustment. A scraper *s*³ extends outwardly from the shaft of the disk, in the manner shown, its edge being coincident with the face of the disk and nearly in contact therewith, to prevent the accumulated material adhering thereto from being carried beyond the desired altitude.

In the operation of the apparatus the disk is at the outset adjusted in its elevated position, and power being applied in any ordinary manner the pan is set in motion and the grinding process is continued until the contents thereof have been reduced to the desired degree of plasticity, whereupon the disk is depressed to its engaging adjustment, in which, the revolution of the receptacle being further continued, it will be revolved through contact therewith, the plastic mass will be brought into contact with its opposing face, and adhering thereto will be borne upwardly in its revolution until intercepted and

detached by the scraper, it will in an obvious manner be caused to fall outwardly over the rim of the pan into any suitable receptacle.

As will be manifest, the diagonal arrangement and the end curvature of the end scrapers s and s' effect clearance of accumulating matter from the dish-shaped sides of the pan and direct such matter into the path of the rollers $C C$, while the form and dimensions of the disk adapt it to fit the curved sides of the pan and in the revolution thereof take up from the same all adhering matter and gradually but surely bring it into position to be acted upon, first, by the chasing-rollers, and finally by the adjustable elevating and discharging disk and its scraper.

As will be seen in Fig. 2, the disk and its shaft may be thrown entirely outside the vertical plane of the clay-pan—an adjustment which is sometimes of much advantage when fresh material is to be supplied.

The invention having been thus described, what is claimed is—

1. In a clay-grinding mill, the dish-shaped clay-pan and the circular elevatable and depressible discharging-disk pivotally mounted in bearings outside the pan conformed to the curved interior thereof and adapted to receive rotation from the pan and to carry up adhering matter for discharge over the margin of the pan, in combination.

2. In a clay-grinding mill, the horizontally-revoluble clay-pan and the adjustable discharging-disk receiving rotation from the pan and thereby elevating adhering portions of the contents thereof to their discharging position, in combination.

3. The described horizontally-revoluble one-part clay-pan having curved or dish-shaped sides and continuous unbroken rim, the chasing-rollers arranged transversely of the pan, the obliquely-placed outer scrapers s and s' , mounted upon the obliquely-arranged trans-

verse bar and having curved outer extremities and operating to effect clearance of accumulating matter from the sides of the pan and to direct the same inwardly into the path of the rollers, and the intermediate scraper s^2 , also mounted upon the transverse bar and arranged and operating to direct the contents outwardly into the path of the rollers, in combination.

4. In a clay-grinding mill, a horizontally-revoluble one-part pan having a continuous unbroken and unrecessed rim, combined with a vertically-adjustable discharging-disk, the periphery of which is conformed to the interior surface of the pan and which is adapted to be depressed, moving in the arc of a circle, from its elevated position into engagement with the contents of the pan and to cause such contents to be discharged through the revolution of the pan outwardly over the rim of the same, substantially as set forth.

5. In a clay-grinding mill, a horizontally-revoluble clay-pan, a standard upon a fixed portion of the mill, a shaft pivotally mounted upon the standard, a circular disk revoluble upon the shaft, and a scraper mounted upon the shaft, in combination.

6. In a clay-grinding mill, a discharging-disk which is supported upon a fixed portion of the mill, which has rotary movement in a horizontal plane, which has movement by its shaft upon a horizontal pivot and which is revoluble in a vertical plane upon its pivoted shaft.

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C. D. FELT.