

(No Model.)

2 Sheets—Sheet 1.

E. BROWN.

MACHINE FOR GRINDING FLATS OF CARDING ENGINES.

No. 575,689.

Patented Jan. 26, 1897.

Fig. 1.

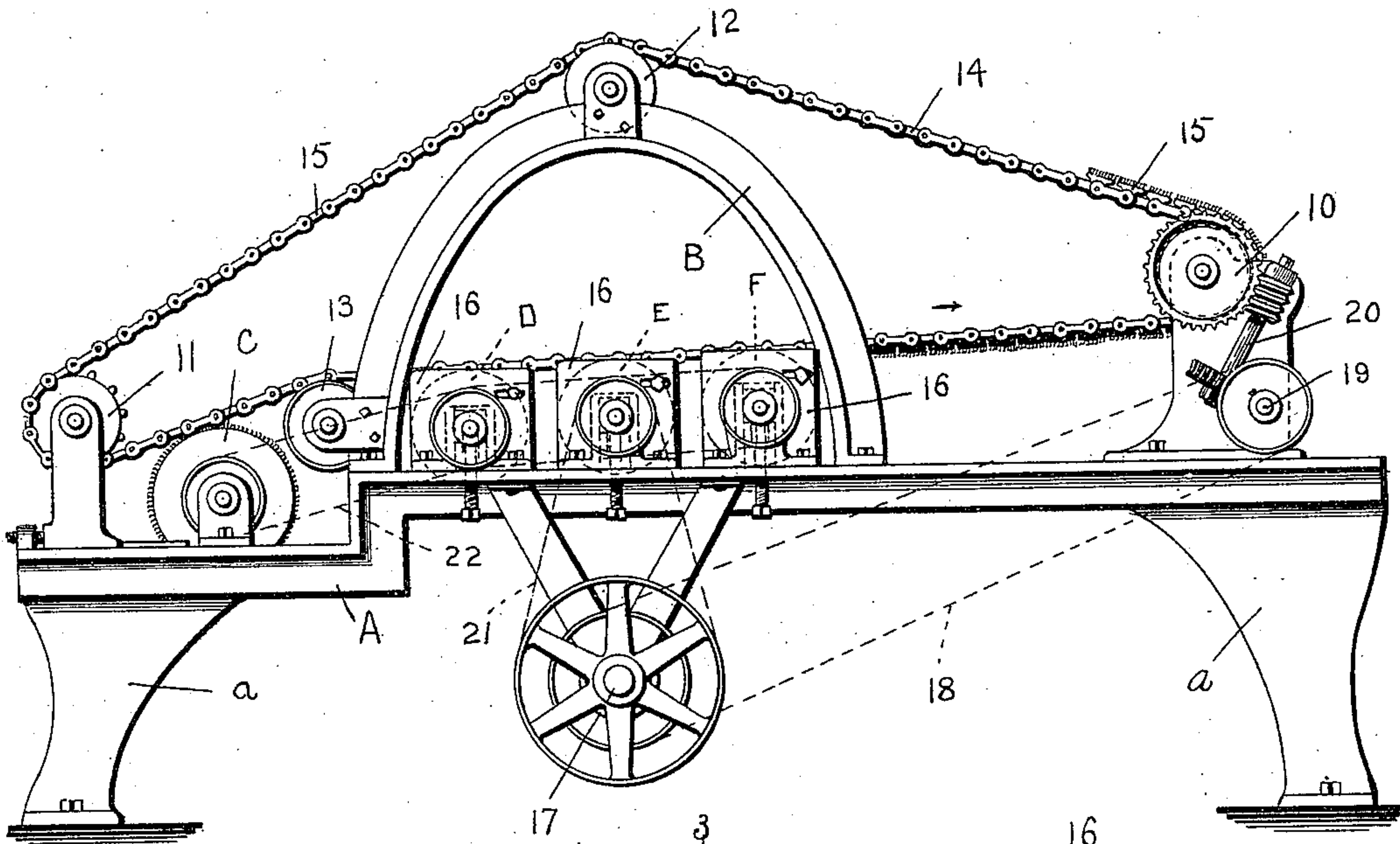
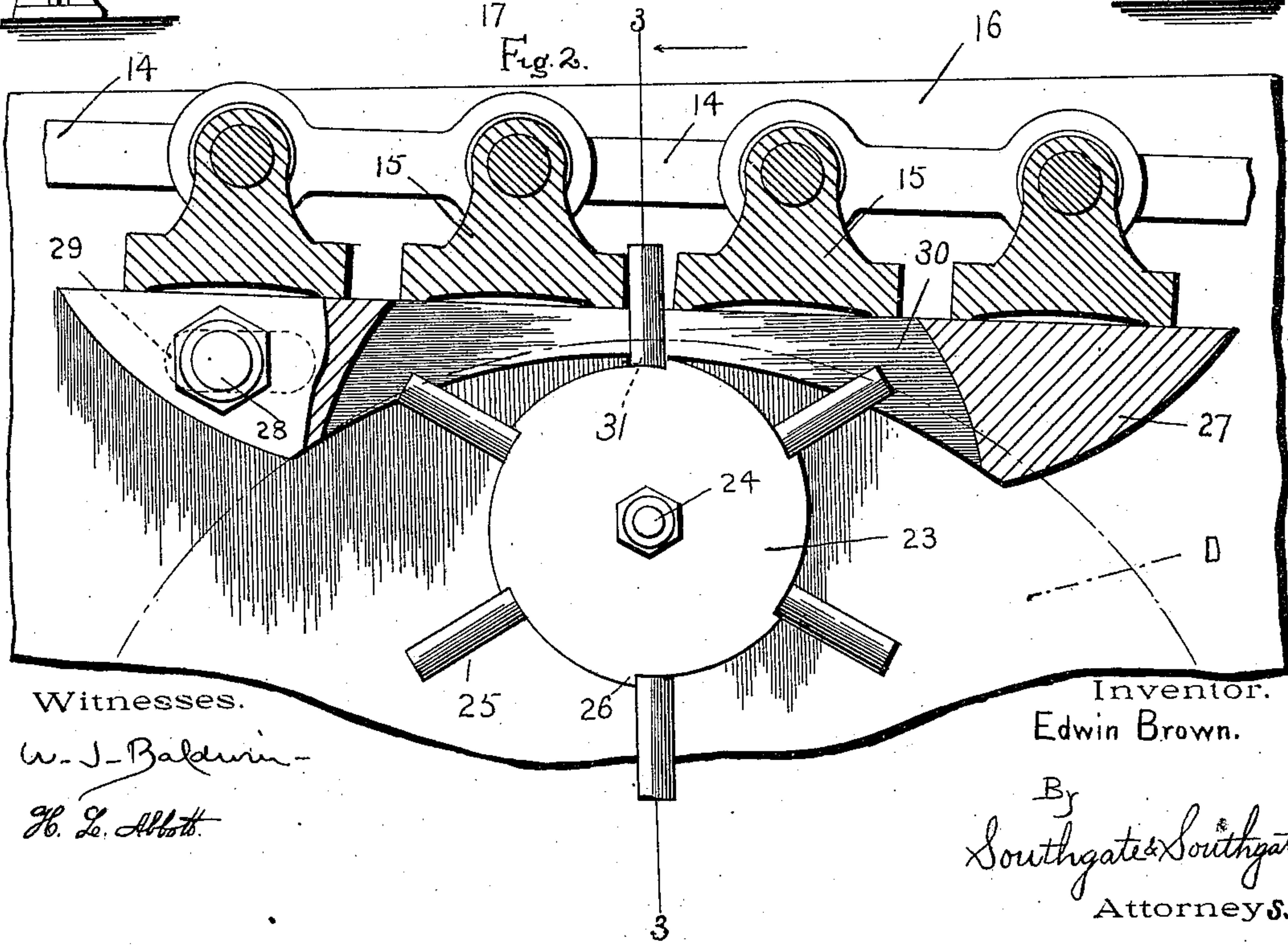


Fig. 2.



Witnesses.

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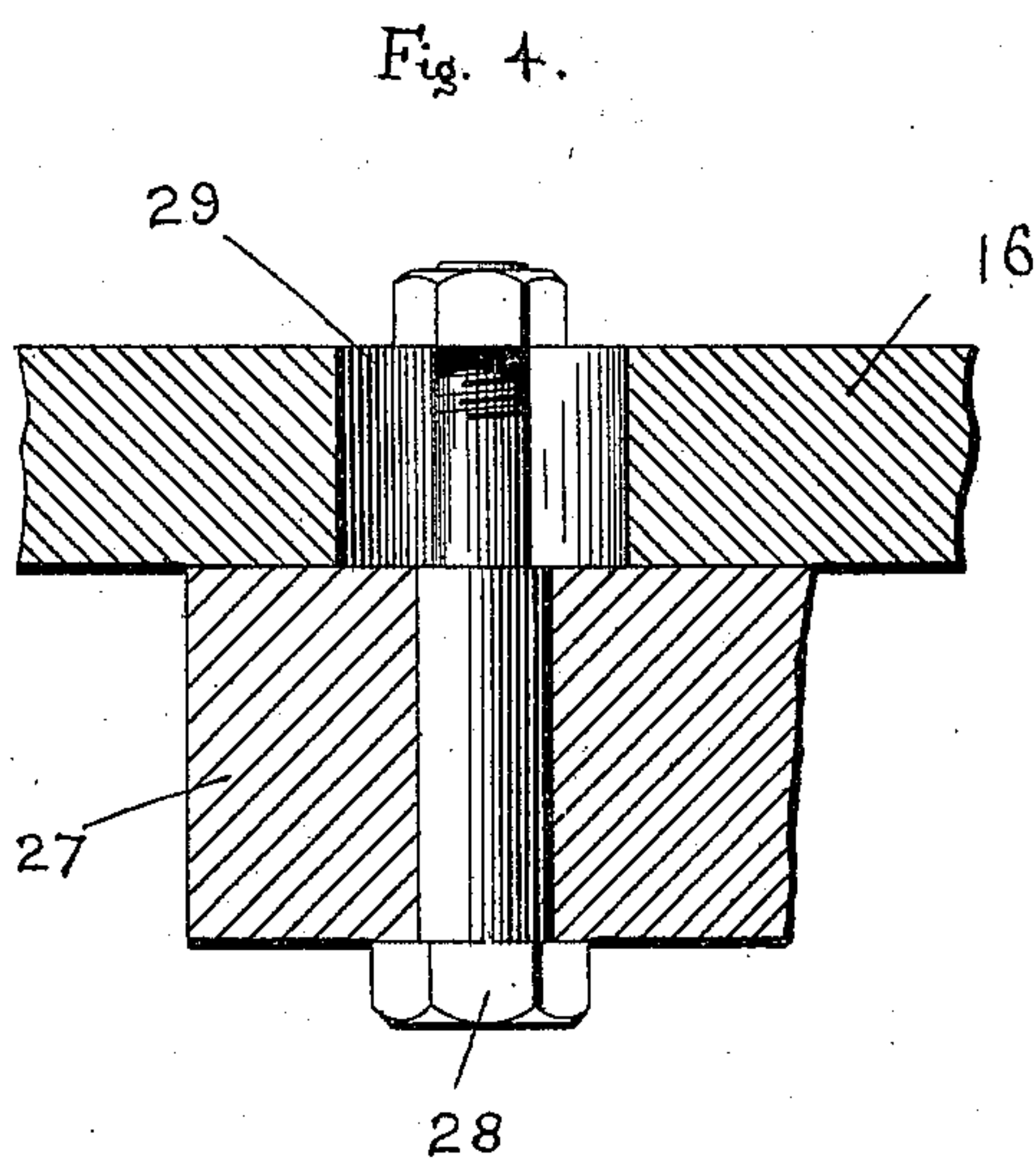
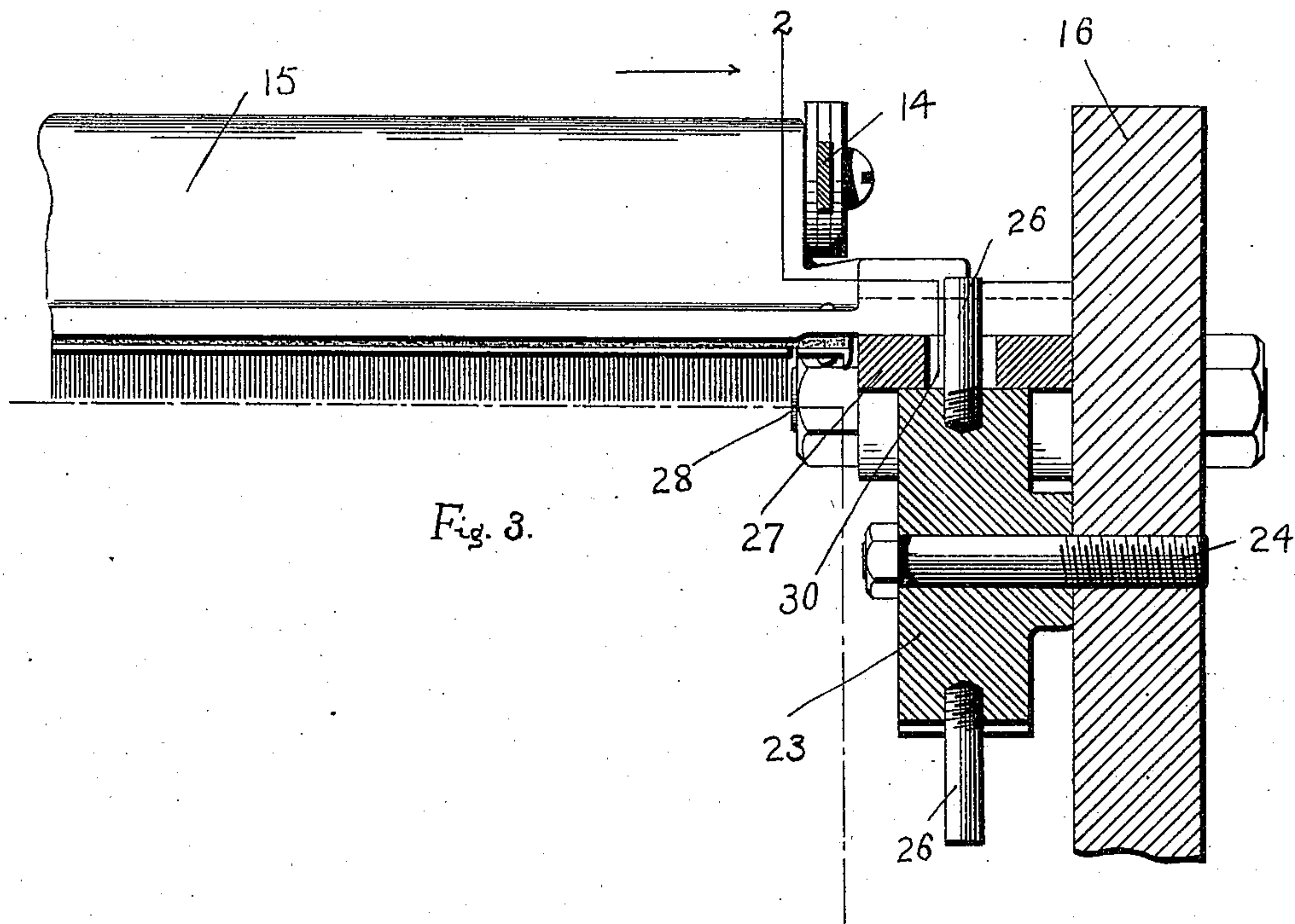
2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

EDWIN BROWN, OF WORCESTER, MASSACHUSETTS.

MACHINE FOR GRINDING FLATS OF CARDING-ENGINES.

SPECIFICATION forming part of Letters Patent No. 575,689, dated January 26, 1897.

Application filed July 10, 1896. Serial No. 598,659. (No model.)

To all whom it may concern:

Be it known that I, EDWIN BROWN, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Machines for Grinding the Flats of Carding-Engines, of which the following is a specification.

My invention relates to an improved mechanism for grinding the flats of carding-engines; and the especial object of my invention is to provide a construction in which the flats may be ground and finished in substantially the same position as when coöperating with the main cylinder of a carding-engine and in the act of carding.

To these ends my invention consists of the parts and combination of parts, as hereinafter described, and more particularly pointed out in the claims at the end of this specification.

In the accompanying two sheets of drawings, Figure 1 is a side view of a machine for grinding the flats of carding-engines constructed according to my invention. Fig. 2 is a detail sectional view taken on the line 2 2 of Fig. 3 and illustrating the flat-actuating mechanism which I preferably employ for moving the grinding-table. Fig. 3 is a sectional view taken on the line 3 3 of Fig. 2, and Fig. 4 is a detail sectional view illustrating the means I preferably employ for pivotally supporting one of the movable grinding-tables.

A mechanism for grinding the flats of carding-engines constructed according to my invention comprises a movable grinding-table adapted to support the flats in a position substantially corresponding with their position when in actual use, a grinding-wheel for engaging the flats as they pass along over the grinding-table, and mechanism actuated by the forward movements of the flats for moving the grinding-table.

The successful operation of a carding-engine depends in a very large measure upon the accurate grinding or finishing of the card-clothing carried by the flats which coöperate with the main cylinder. In practice a clearance of not more than five one-thousandths of an inch is allowed between the clothing on the flats and the clothing on the main cylinder of a carding-engine.

If for any reason a single flat is defective or differs in any way from the rest of the flats employed in a carding-engine, it will prevent the successful operation of the machine and will produce imperfect or cloudy work.

A flat for a carding-engine consists, essentially, of a narrow cast-iron bar, and is ordinarily formed with a longitudinal strengthening web or rib. The lower surface of the flat, upon which the card-clothing is secured, is accurately ground or finished, and in practice the edges of the flat are also ground or planed off. At its ends the flat is provided with "working surfaces," which are ground off at a slight pitch or angle with respect to the bottom surface of the flat.

When mounted in a carding-engine, the working surfaces of the flats travel over what are known as "flexible bends," which are guide-ways arranged substantially concentric with the main cylinder of the carding-engine.

In order to produce a uniform set of flats, it is essential that the flats should be ground or finished from their working surfaces, and on this account the flats can only be supported and guided at their extreme ends while they are being ground and finished.

In practice I have found that a flat which is supported simply at its ends will sag or bend down slightly at its center. Moreover, as it is impossible to produce perfectly uniform bars out of cast-iron, the amount of sag or bend will vary among the individual flats.

The grinding mechanisms for the flats of carding-engines which have heretofore been employed, in which the flats are finished and ground in an inverted position, I have found to be defective, as the natural bend or sag of the flats will be opposite to that which takes place when the flats are in use, and the pressure of the grinding-roller will also add to the inaccuracies which result from grinding or finishing the flats in this position. Flats which are ground and finished in this manner will therefore be "low" in the center and will produce cloudy and imperfect work in the engine. Moreover, the individual flats, on account of their various strengths and stiffness, will differ somewhat among themselves, thus adding to and increasing the difficulties which result where the flats are ground in this manner.

The essential object of my invention is to overcome such defects and to provide a mechanism in which the flats are supported and finished in substantially the same position which they occupy when in actual use, and in which a complete set of flats for use on a carding-engine can be ground at one operation.

To provide for the necessary pitch between the working faces of the flats and the clothing, I preferably provide flat-actuated mechanism for moving the grinding-tables over which the flats are made to travel, and in practice I preferably employ cam-wheels, having series of pins arranged to extend up in position to be engaged by the front edges of the flats as they travel along over the grinding-tables. By means of this construction the motion of the flats themselves will be utilized to allow for the necessary pitch, and as the fronts of the flats are ordinarily trued off or finished I am enabled to actuate such devices from a finished part or surface.

Referring to the drawings and in detail A, designates the main frame of a grinding-machine constructed according to my invention. The frame A is mounted upon and carried by suitable legs *a*. Fastened upon and carried by the frame A are suitable arches or side frames B.

The flats 15 to be acted upon are connected together by endless chains 14 in the ordinary manner, and are arranged to pass over driving-sprockets 10 at one end of the machine, guide-rollers 12, adjustable sprockets 11, and guide-rollers 13. The guide-rollers 13 are located slightly below the driving-sprockets 10, so that as the flats travel between the guide-rollers 13 and the driving-sprockets 10 they will move in a slightly-inclined path, for a purpose hereinafter explained.

The grinding mechanism is arranged to act upon the flats as they pass from the guide-rollers 13 to the driving-sprocket 10, and I preferably employ a plurality of adjustable grinding-rolls arranged to act successively.

As shown, I have illustrated three grinding-rolls D, E, and F. It is obvious, however, that a single grinding-roll may be employed, if desired, or any different number from that illustrated may be used.

Any ordinary or preferred driving-gear may be used for actuating the machine.

As shown, 17 designates a driving-shaft, to which power may be applied in any of the ordinary or preferred manners. Connected to and driven from the shaft 17 by means of a belt 18 (indicated by dotted lines) is a shaft 19, which drives an inclined shaft 20 by means of suitable worm-gearing. The inclined shaft 20 is geared by means of a worm and worm-wheel to slowly turn the driving-sprockets 10.

The grinding-wheels D, E, and F are connected to and driven from the shaft 17 by means of belts 21. (Indicated by dotted lines.)

In connection with the grinding mechanism

I also preferably employ a burnishing-wheel for cleaning and burnishing the flats.

As illustrated, C indicates a burnishing-wheel, which may be driven by belt 22 from the grinding-wheel D and is provided with card-clothing for brushing out or burnishing the flats 15. The devices coöperating with the grinding-rolls D, E, and F are of similar construction and are duplicated at each side of the machine, so that a description of one such set of devices will be sufficient. As shown, the grinding-rolls are mounted in suitable side frames 16, carried upon the main frame A.

The movable grinding-tables 27, along which the flats travel while being ground, are preferably slotted longitudinally, and are supported upon adjustable pivots, so that they may be set or adjusted to produce the desired pitch.

As shown in Figs. 2 to 4, the grinding-table 27 is pivoted on a stud 28, which is adjustably secured in a slot 29 in the side frame 16. Coöperating with the grinding-table 27 and arranged to move the same is a cam-wheel 23, journaled on a stud 24 in the frame 16. The cam-wheel 23 is provided with a series of cams or projections 26 for moving the table 27 and with a series of corresponding pins 25, arranged to extend up through the longitudinal slot in the table 27 in position to be engaged by the front edge of the flats 15 as they move along over the table.

In practice I preferably arrange the movable tables 27 at a slight inclination, so that as the flats 15 are drawn or moved thereover a certain resultant part of the pull or pressure exerted thereon will tend to hold the flats firmly down upon the grinding-tables.

It is obvious that flat-grinding mechanism constructed according to my invention may be employed with advantage upon the carding-engine itself and may be arranged substantially under one of the end sprockets of the engine. I do not wish, therefore, to be limited to the application of my flat-grinding devices to any particular form of machine; but

What I claim, and desire to secure by Letters Patent of the United States, is—

1. In a mechanism for grinding the flats of carding-engines, the combination of movable grinding-tables, a grinding-wheel, means for feeding a series of flats along the grinding-tables so that they will assume substantially the same position as when carding, and mechanism actuated by the forward movement of the flats for raising the grinding-tables, substantially as described.

2. In a mechanism for grinding the flats of carding-engines, the combination of a movable grinding-table, means for feeding the flats along over the grinding-table, a grinding-roll, and a cam-wheel for moving the grinding-table, said cam-wheel having projections or pins extending up in position to be engaged by the forward edges of the flats, as they

move along over the grinding-table, substantially as described.

3. In a mechanism for grinding the flats of carding-engines, the combination of a longitudinally-slotted, pivoted grinding-table, means for adjusting the pivot of said grinding-table, means for feeding flats along over said grinding-table, and a cam-wheel having projections for moving the grinding-table, and a corresponding series of pins extending up through the slot in the grinding-table in position to be engaged by the forward edges of the flats as they move along over the grinding-table, said parts being arranged so that a set of flats may be ground in substantially the same position as when in use, substantially as described.

4. In a mechanism for grinding the flats of carding-engines, the combination of inclined, vertically-movable grinding-tables, a grinding-wheel, means for feeding a series of flats over the grinding-wheel and along the inclined tables so that the flats may be ground while in substantially the same position which they assume when carding, and mechanism actuated by the forward movement of the flats for raising the grinding-tables, substantially as described.

5. The combination of a plurality of successive, vertically-movable grinding-tables, a plurality of successive grinding-wheels, means for feeding a series of flats over said grinding-wheels and along the tables so that the flats may be ground in substantially the same position that they assume when carding, and mechanism actuated by the forward movement of the flats for raising the grinding-tables, substantially as described.

6. In a mechanism for grinding the flats of carding-engines, the combination of a plurality of inclined movable grinding-tables, means for feeding flats along over the grinding-tables, grinding-wheels for engaging the flats, and cam-wheels for moving the grinding-tables, said cam-wheels having projections or pins extending up in position to be engaged by the forward edges of the flats as they move along over the grinding-tables, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

EDWIN BROWN.

Witnesses:

PHILIP W. SOUTHGATE,
FREDERICK B. HARLOW.