(No Model.)

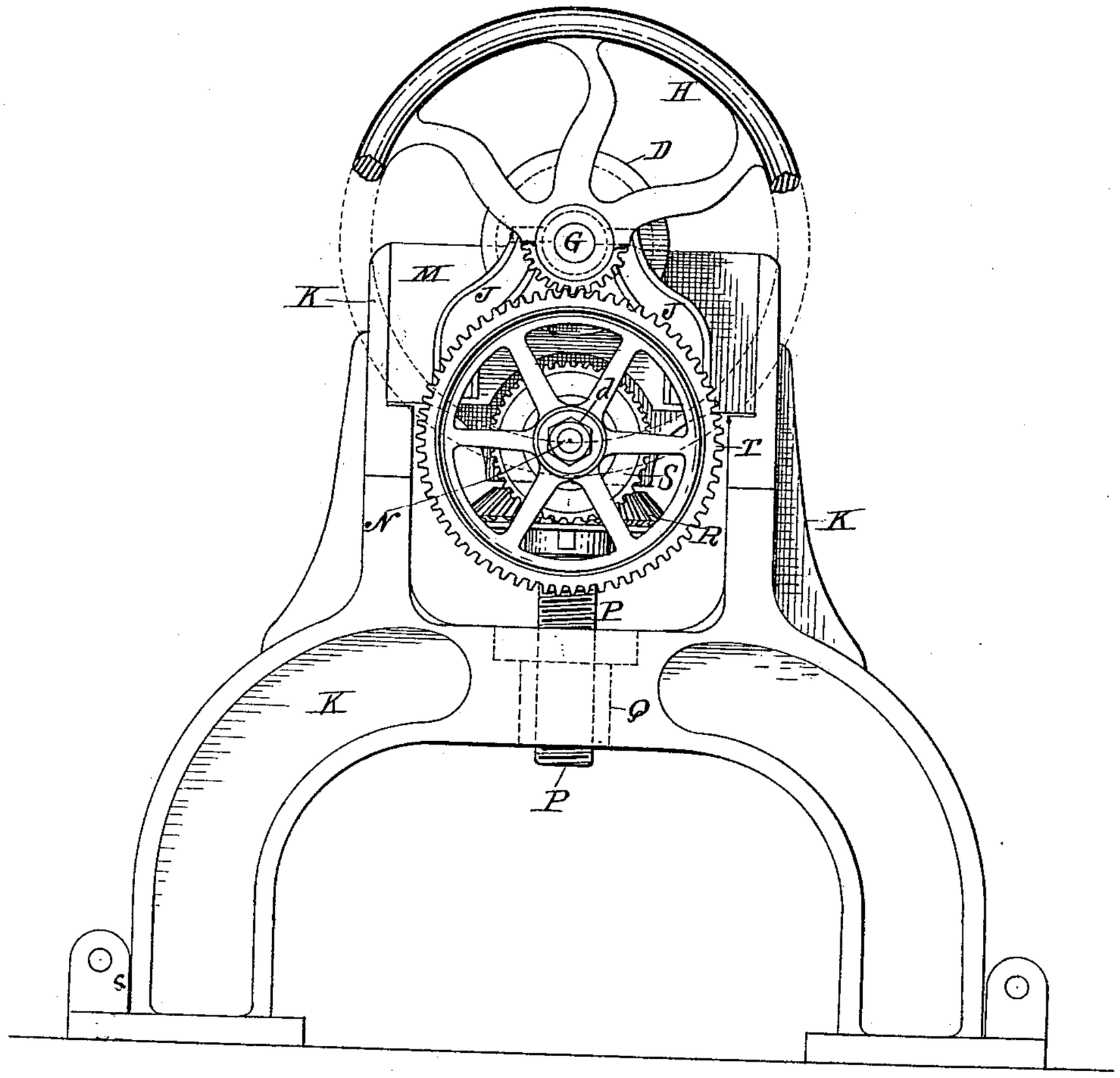
2 Sheets—Sheet 1.

C. S. BARTON.

PAPER PULP ENGINE ROLL.

No. 273,801. Patented Mar. 13, 1883.

Fig. 1.



Witnesses;
John C. Dewey.
Chas. D. Gaff.

Inventor;
Charles S. Barton

(No Model.)

2 Sheets—Sheet 2.

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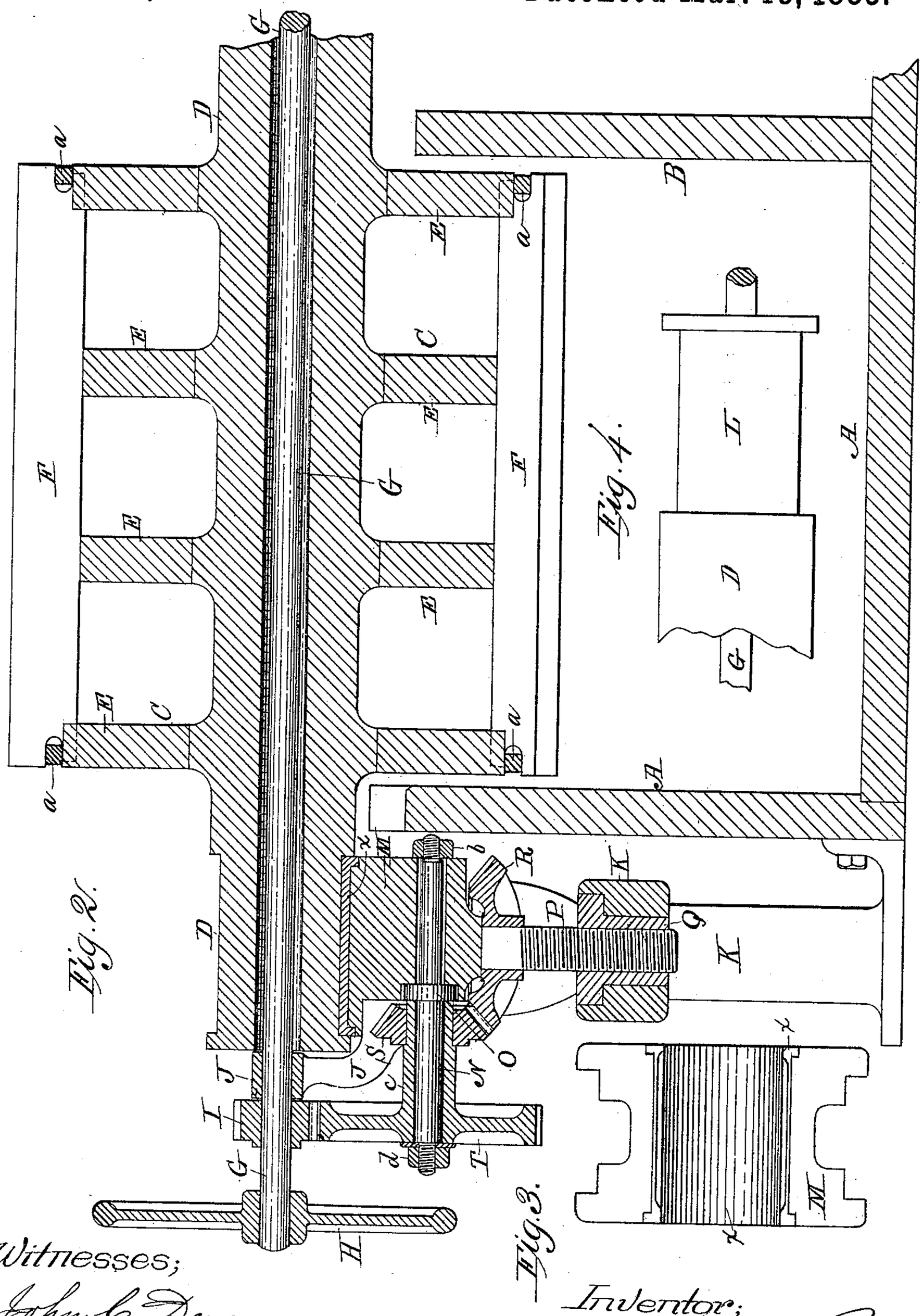

Fig. 1.

Fig. 4.

Fig. 2.

Fig. 3.

Witnesses;
John C. Dewey
Chas. D. Gaff.

Inventor;
Charles S. Barton

UNITED STATES PATENT OFFICE.

CHARLES S. BARTON, OF WORCESTER, MASS., ASSIGNOR TO THE RICE, BARTON & FALES MACHINE AND IRON COMPANY, OF SAME PLACE.

PAPER-PULP-ENGINE ROLL.

SPECIFICATION forming part of Letters Patent No. 273,801, dated March 13, 1883.

Application filed November 6, 1882. (No model.)

To all whom it may concern:

Be it known that I, CHARLES S. BARTON, of the city and county of Worcester, and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Paper-Pulp-Engine Rolls Used in Grinding Stock in the Manufacture of Paper; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 represents an end view of the mechanism used for raising and lowering the engine-roll, said mechanism being at each end of the engine-roll. Fig. 2 represents a vertical central section of the mechanism shown in Fig. 1, and also of the engine-roll and the tub in which the stock to be beaten and ground is placed. Fig. 3 represents a plan or top view of the bearing-block M, Fig. 2 of the drawings, and Fig. 4 represents the opposite end of the engine-roll spindle from that shown in Fig. 2 of the drawings. Said end shown in Fig. 4 is supported by mechanism the same as that shown in Figs. 1 and 2 of the drawings.

My invention relates to engine-rolls used for grinding and beating stock in the manufacture of paper; and it consists in having the spindle of the roll cast hollow for the purpose of containing a shaft which is used in connection with mechanism adapted for the purpose (placed at each end of the engine-roll spindle on each side of the tub which contains the stock) to raise or lower both ends of the roll at the same time by operating said mechanism at one end of the roll on one side of the tub.

To enable those skilled in the art to which my invention belongs to make and use the same, I will proceed to describe it more in detail.

In the drawings, the part marked A, Fig. 2, represents a portion of the tub, such as is usually used to hold the rags or other material to be reduced with water and ground up to a fine pulp by the knives on the roll.

The part B represents the partition or mid-fellow in the middle of the tub A, and about two-thirds of its length around this mid-fellow the material in the tub circulates and flows, being acted upon by the knives on the engine-roll, which roll is situated between said mid-fellow B and one side of the tub A, as in all machines of this kind.

The part C represents the engine-roll of the usual form; D, the spindle of said roll, which spindle is cast hollow for the purpose to be hereinafter more fully stated.

The parts E E represent heads projecting from the spindle D, cast thereon or attached thereto in any suitable manner. On the outer edges of these heads E knife-blades F are fitted in slots and held in place by means of bands *a a*, passing around the roll on each end thereof, and fitting into a notch in each end of the knife-blades F, as shown in Fig. 2 of the drawings.

The part G represents a shaft running through the hollow spindle D, with the hand-wheel H at one end of said shaft, and the small gear-wheel or pinion I keyed thereto at each end thereof. Said shaft G is supported in position at each end by the arms or projecting parts J, Figs. 1 and 2, extending out from and bolted to the bearing-block M, or attached thereto in any other suitable manner. These arms J form bearings in which the shaft G turns, and by means of which the position of said shaft relatively to the spindle D is always the same.

The part K, Figs. 1 and 2, represents a suitable iron frame at the side of the tub A for supporting the bearing of one end of the spindle D, and also for holding in proper position the mechanism arranged to raise and lower said spindle and the roll C. There is a similar frame at the other side of the tub A, which is not shown in the drawings, for supporting the bearing of the other end, L, of the spindle D, Fig. 4 of the drawings. The frames K are bolted to the side of the tub A and also to the floor to hold them securely and firmly in position.

The part M, Figs. 1 and 2, represents a bearing-block, the top of which is hollowed out and fitted with a brass lining, *x*, as shown in Figs. 2 and 3, to form a bearing for the end of the spindle D to turn in. The block M has a hole bored in its lower part, into which the stationary stud N is inserted, as shown in Fig. 2. Said stud is held securely in place in the block M by means of the collar O on said stud and the nut *b* on one end of said stud, which pre-

vent it also from turning in the block. The lower part of the block M is tapered down, and rests for support upon the head of the screw P. The thread of the screw turns in a nut, Q, fitted into the frame K, as fully shown in Figs. 1 and 2 of the drawings. Upon the upper part of the screw P is keyed a beveled gear, R, which meshes with the smaller beveled gear, S, which is keyed onto the hub or cast on the hub of the large gear-wheel T, which in turn meshes with the small gear-wheel I, keyed onto the shaft G, as before described. The gear-wheel T is cast with a hub, *c*, Fig. 2, extending out on one side of said gear. This hub *c* turns upon the stationary stud N, extending out from the block M, and is prevented from sliding off of said stud by the nut *d* at the end of the stud N. As before stated, the beveled gear S is keyed to or cast on the hub *c* of the gear T and turns with said gear.

On the other side of the tub A from that shown in the drawings, as has been before stated, there is a supporting-frame for supporting the bearing of the other end, L, of the spindle D, (shown in Fig. 4,) and the mechanism for raising and lowering that end of the spindle D. Said frame and the mechanism thereon being the same as that already described, it will not be necessary to describe the same.

The operation of my improved engine-roll is as follows: The roll C is made to revolve in the usual way, by means of a belt and pulley, and the material in the tub, by the current formed by the revolutions of the roll, is drawn in between the bed-plate in the tub A, under the roll and the knife-blades F, in the usual way in engine-rolls. As the material in the tub becomes finer, being ground and beaten up into a pulp by the action of the knife-blades F upon said material, the knife-blades fail to act upon the material in the tub, and it is necessary to gradually lower the roll C, with the knife-blades thereon, so that they will continue to act on the material in the tub in connection with the bed-plate in the tub before mentioned. By my invention this is done in a very easy, simple, and perfect manner, and in such a way that both ends of the spindle D, which supports the roll C and the knife-blades F thereon in position, will be lowered at the same time, and by one operation, so that the edges of the knife-blades F will always be in a position parallel to the top of the bed-plate in the tub A, and the full length of said knife-blades will thus always act evenly upon the material in the tub A in connection with the bed-plate in said tub. As has been before stated, the shaft G is held always in the same position relatively to the hollow spindle D and bearing-block M by the arms or supports *x*. The roll C is raised or lowered by turning the hand-wheel H, keyed to the shaft G. The small gear-wheel I, also keyed to said shaft, meshes with and turns the large gear-wheel T. It also turns the small beveled gear S on the hub *c* of the gear T. Said beveled gear S meshes with and turns the beveled gear R, which, being keyed upon the head of the screw P, causes said screw to turn in its supporting-nut Q, said screw P being raised or lowered by means of the system of gears above described, according as the hand-wheel H is turned in one direction or the other. The base of the supporting and bearing block M, resting upon the head of the screw P, is raised or lowered with said screw, and the end of the spindle D of the roll C resting upon said block M is also raised or lowered together with the roll C at the same time.

With mechanism upon the other side of the tub for supporting the other end, L, of the spindle D, the same as that shown in Figs. 1 and 2 of the drawings, and operating in the same manner, it will be readily seen that a person standing on one side of the tub A, by turning the hand-wheel H on one end of the shaft G, can raise or lower both ends of the spindle D with the roll C at the same time and by one operation, the roll C being raised or lowered evenly and uniformly, and this can be done while the roll C is revolving and without stopping the operation of the machine.

Having described my improvements in engine-rolls, what I claim therein as new and of my invention, and desire to secure by Letters Patent, is—

1. An engine-roll having the spindle thereof hollow for the purpose of containing a shaft to raise or lower said roll, substantially as shown and described, and for the purposes set forth.

2. In an engine-roll, the combination, with the hollow spindle D, of the shaft G, constructed and arranged substantially as shown and described.

3. In an engine-roll, the combination of the roll C and shaft G, with mechanism to raise or lower said roll, constructed and arranged to operate substantially as shown and described.

CHARLES S. BARTON.

Witnesses:
JOHN C. DEWEY,
CHAS. D. GAY.