(No Model.) 2 Sheets—Sheet 1.

T., W. & J. BIRCH.

CLAY PULVERIZING MACHINE.

No. 313,572. Patented Mar. 10, 1885.

Fig. 1.

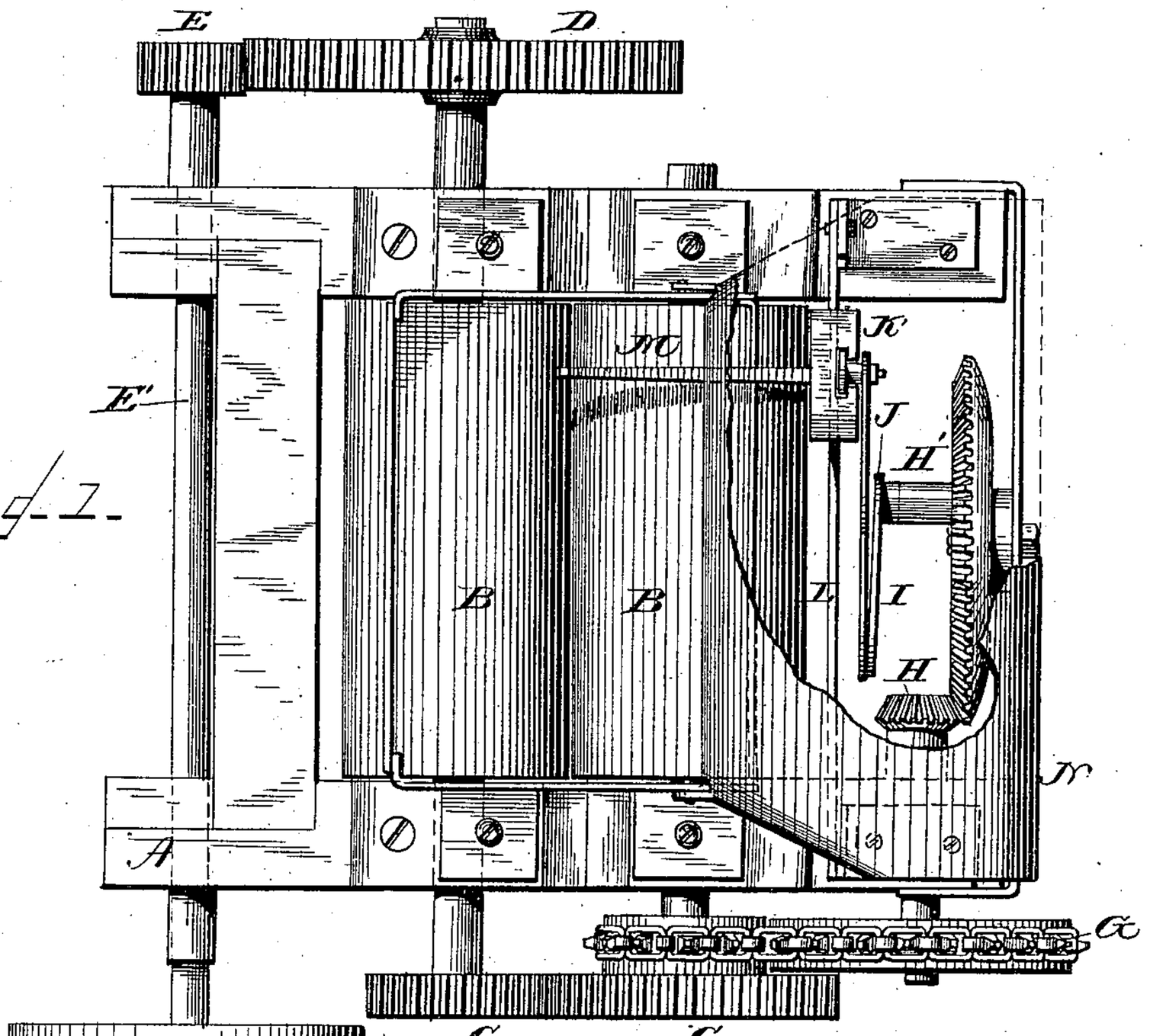
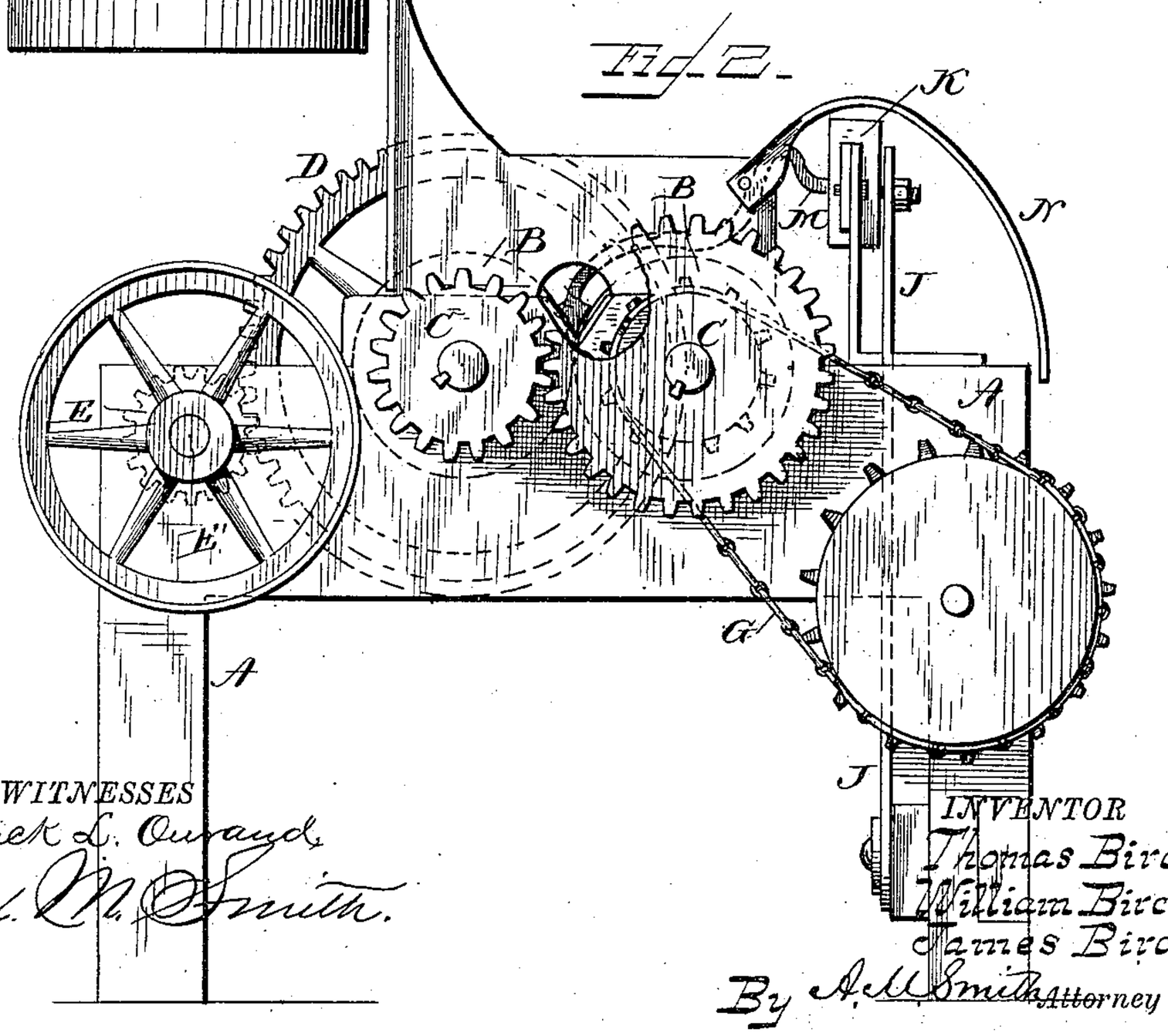


Fig. 2.



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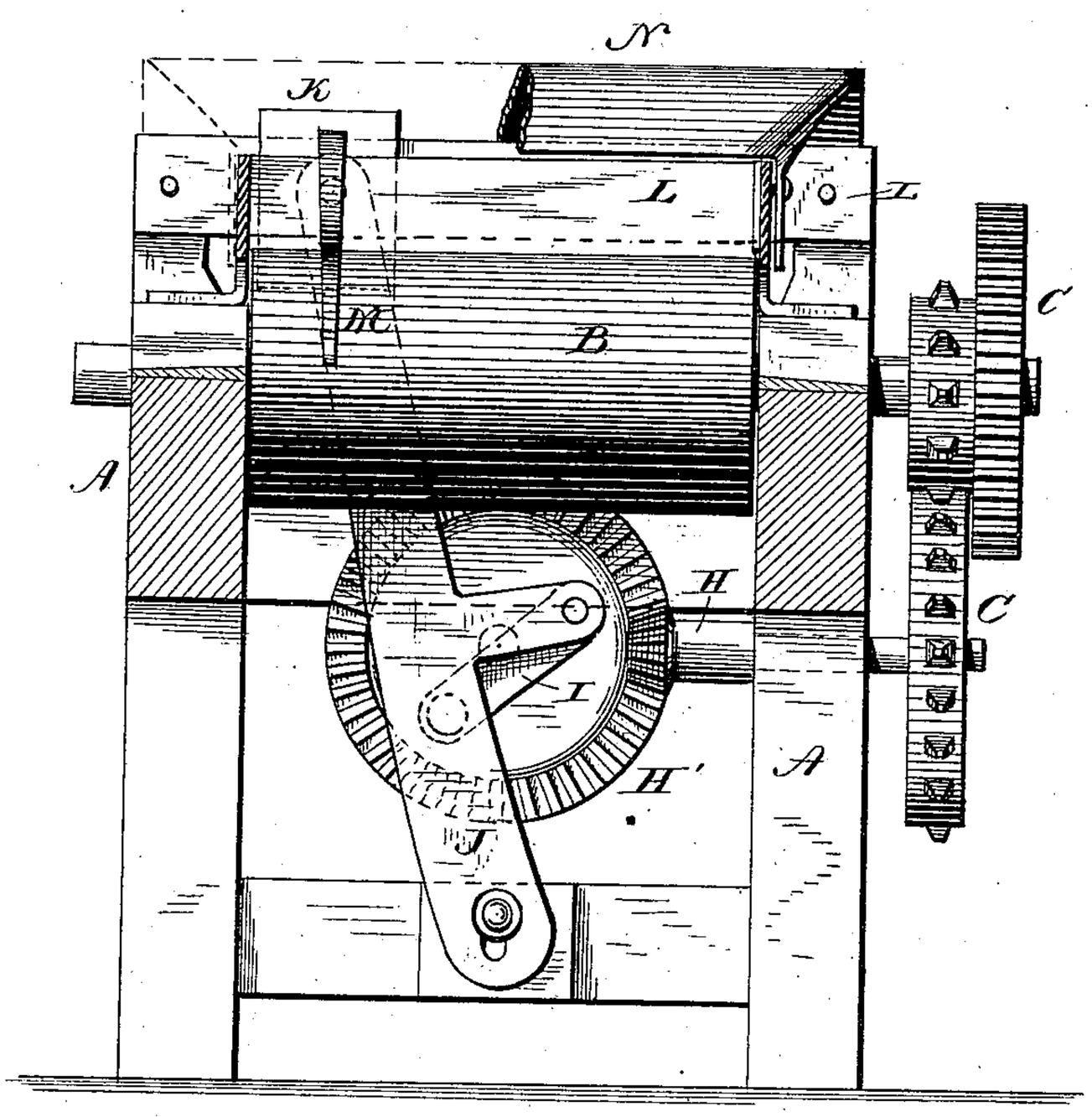

Fig. 3.

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UNITED STATES PATENT OFFICE.

THOMAS BIRCH, WILLIAM BIRCH, AND JAMES BIRCH, OF CRAWFORDSVILLE, INDIANA.

CLAY-PULVERIZING MACHINE.

SPECIFICATION forming part of Letters Patent No. 313,572, dated March 10, 1885.

Application filed September 3, 1884. (No model.)

To all whom it may concern:

Be it known that we, THOMAS BIRCH, WILLIAM BIRCH, and JAMES BIRCH, of Crawfordsville, county of Montgomery, and State of Indiana, have invented a new and useful Improvement in Clay-Pulverizing Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

Our invention relates to an improvement in pulverizers or machines for crushing and grinding clay, for the purpose of reducing the same to a condition which will adapt it for use in the manufacture of bricks, tiles, or other earthenware articles.

It consists in the combination, with a suitable frame, of pulverizing-rollers adapted by suitable mechanism to revolve at different rates of speed, for a purpose hereinafter set forth, a laterally-vibrating stone-separating arm for removing the gravel, stones, and other foreign substances from the clay or material operated upon, and means for actuating said arm, hereinafter fully described.

In the accompanying drawings, Figure 1 represents a plan view of our improved clay-pulverizer; Fig. 2, a side elevation of the same, and Fig. 3 an end elevation.

Like letters denote like parts in the different figures of the drawings.

A represents the frame of the machine, upon which the crushing-rollers, gearing, &c., are mounted. B B are the crushing and pulverizing rollers, mounted in suitable bearings upon the side frame-timbers of the machine. Said rollers B B are provided at their ends, outside of the frame-timbers, with gear-wheels C C, of different diameters, for the purpose of causing them to rotate at different rates of speed when motion is imparted to them. Motion is imparted to the rollers B B by means of gears D and E, the former mounted upon the shaft of one of the pulverizing-rollers B, and the latter upon a supplemental shaft, E′, upon which is also mounted a driving-pulley, through which motion is imparted to the gears D and E, and thence to the crushing-rollers B B.

It will be obvious that as the two rollers, by means of the gearing described, are caused to rotate at different rates of speed the surface velocity of one roller will be greater than the surface velocity of the other. It will also be obvious that where the two rollers have the same surface velocity they will simply crush and pack the clay, discharging it in flakes, whereas when the peripheries of the two rollers travel at unequal speeds a grinding action is produced, which pulverizes the clay and puts it in better condition to absorb the moisture in the process of tempering, which makes it more plastic and uniform in texture.

Rollers of different diameters may be employed for giving an increased surface velocity of one of the rollers over the other without departing from the present invention; but the arrangement above described is the one preferred.

Stone-separating attachments to clay-crushers have heretofore been devised, but have been unsatisfactory (more or less) on account of imperfect construction and mode of operation, in some instances failing to do what was claimed for them, and in others on account of liability to derangement from complication and number of the parts of the mechanism.

In our stone-separating attachment we have endeavored to obtain a positive movement for removing the stone with as few parts and the least complication possible to obtain the result.

Its mode of operation is as follows: By means of a sprocket chain and wheel, G, which is driven by another wheel at the back of cog-gear C, motion is communicated to a pair of bevel-gears, H H′, which in turn, by means of the crank-wrist on the bevel-wheel H′ and the connecting-rod I, impart a reciprocating motion to the lever J, the upper end of which is connected by means of a wrist-pin to the sliding head K on the slide-bar L. The sliding head K carries a projecting arm or finger, M, which is so shaped as to come very nearly in contact, or it may be in close contact, with the two rollers at or near their point of engagement. By the continuous rotary motion of the bevel-gears above mentioned the arm M, by means of the connections described, is caused to move alternately from end to end of the rollers, thereby engaging and pushing out

stones, gravel, or any other hard substances which may be in the clay (such as will not pass through the rollers and be crushed) through openings in the ends of the hopper for that purpose, at the same time allowing the clay to pass between the rollers and be crushed by their continuous rotary motion. N is a shield to keep dirt off the slide-bar and out of the gearing.

We do not wish to limit ourselves to the means described for giving a reciprocating motion to the arm or finger M, as it may be done by means of a rack and pinion, or by a screw engaging a nut in a sliding head so arranged as to have alternate motion, or by any other suitable device for obtaining a like result. Neither do we limit ourselves to the use of one arm or finger, as two or more might be used and so arranged as to travel from each end to the center of the length of the rollers and return; but by preference we use one arm traveling alternately from end to end of the rollers.

Having now described our invention, we claim as new—

1. The pulverizing-rollers of equal diameters rotating at different rates of speed, in combination with the reciprocating arm M, carried by the sliding head K, and means for actuating said head automatically, substantially as described.

2. The combination, in a clay-crushing machine, of an automatically-reciprocating arm or arms, with crushing-rollers having unequal surface velocities, as and for the purpose set forth.

3. The combination, with the hopper provided with the outlet-passages in its side walls, of the reciprocating arm or arms, and means for automatically actuating said arm or arms, substantially as and for the purpose described.

In testimony whereof we have hereunto set our hands this 29th day of August, A. D. 1884.

THOMAS BIRCH.
WILLIAM BIRCH.
JAMES BIRCH.

Witnesses:
JOHN H. SOUGER,
R. HEATH.