(No Model.) 3 Sheets—Sheet 1.

A. L. BREWER & H. HEESEN.

BRICK AND TILE MACHINE.

No. 318,347. Patented May 19, 1885.

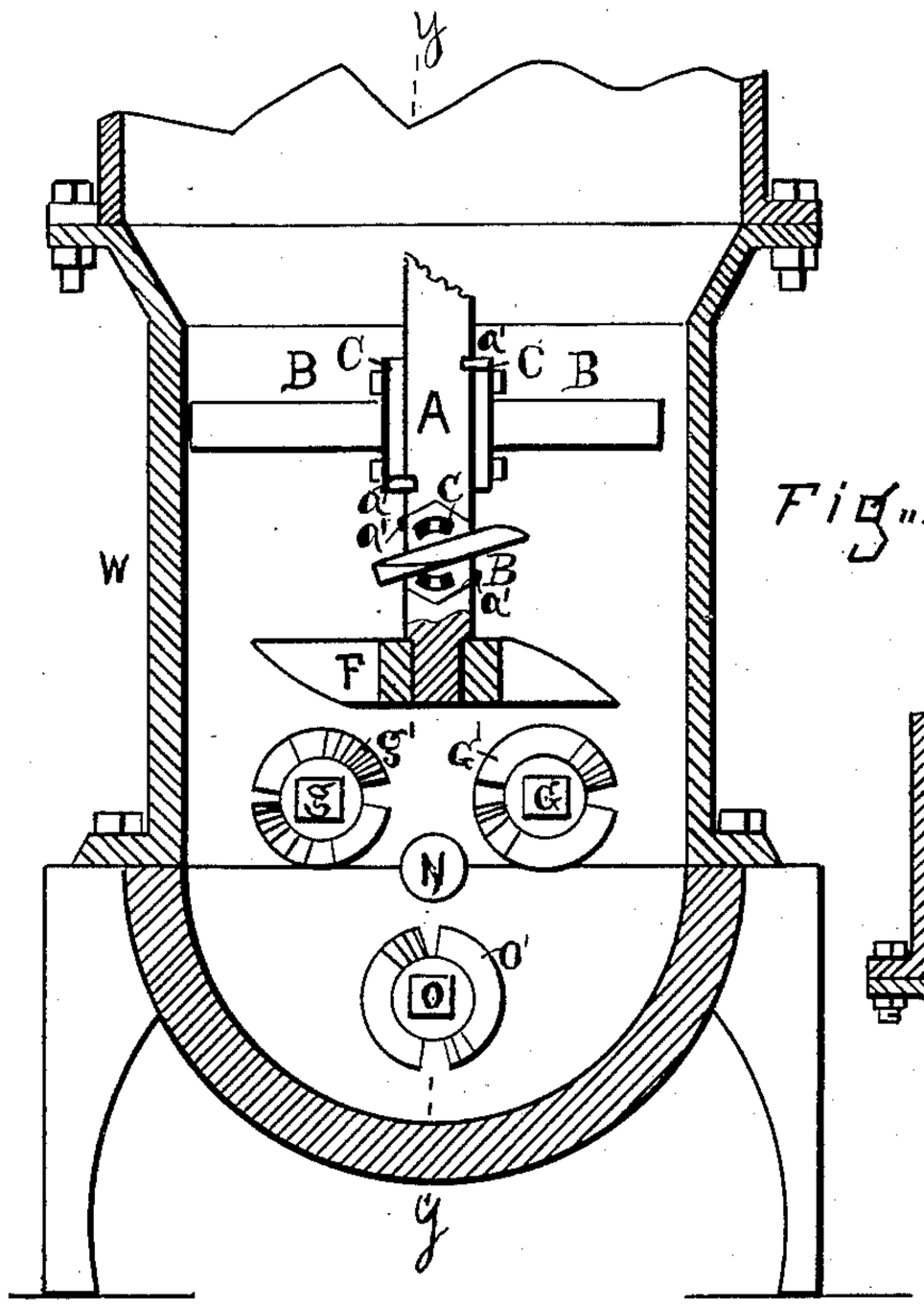

Fig. 1

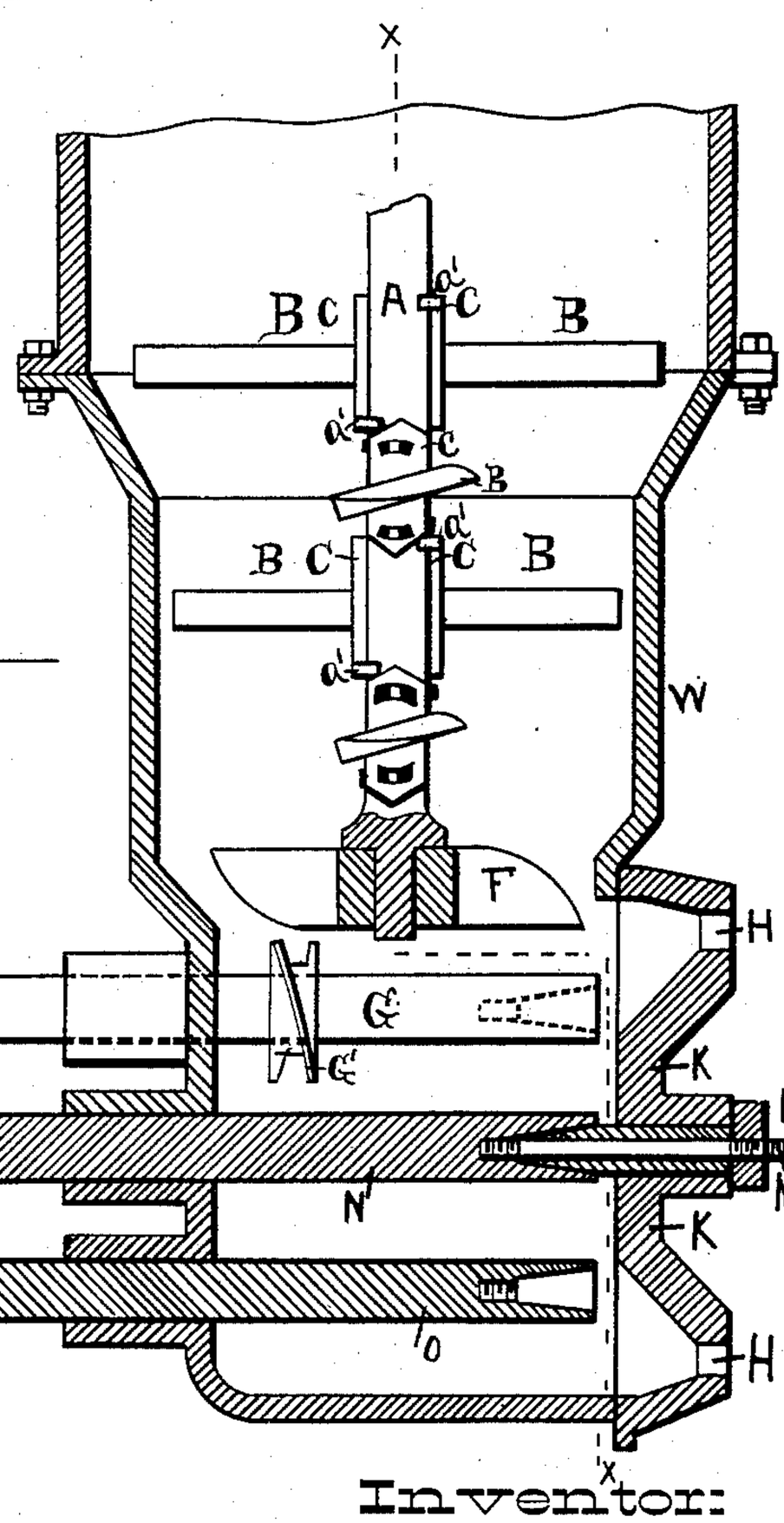

Fig. 2

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(No Model.) 3 Sheets—Sheet 2.

A. L. BREWER & H. HEESEN.

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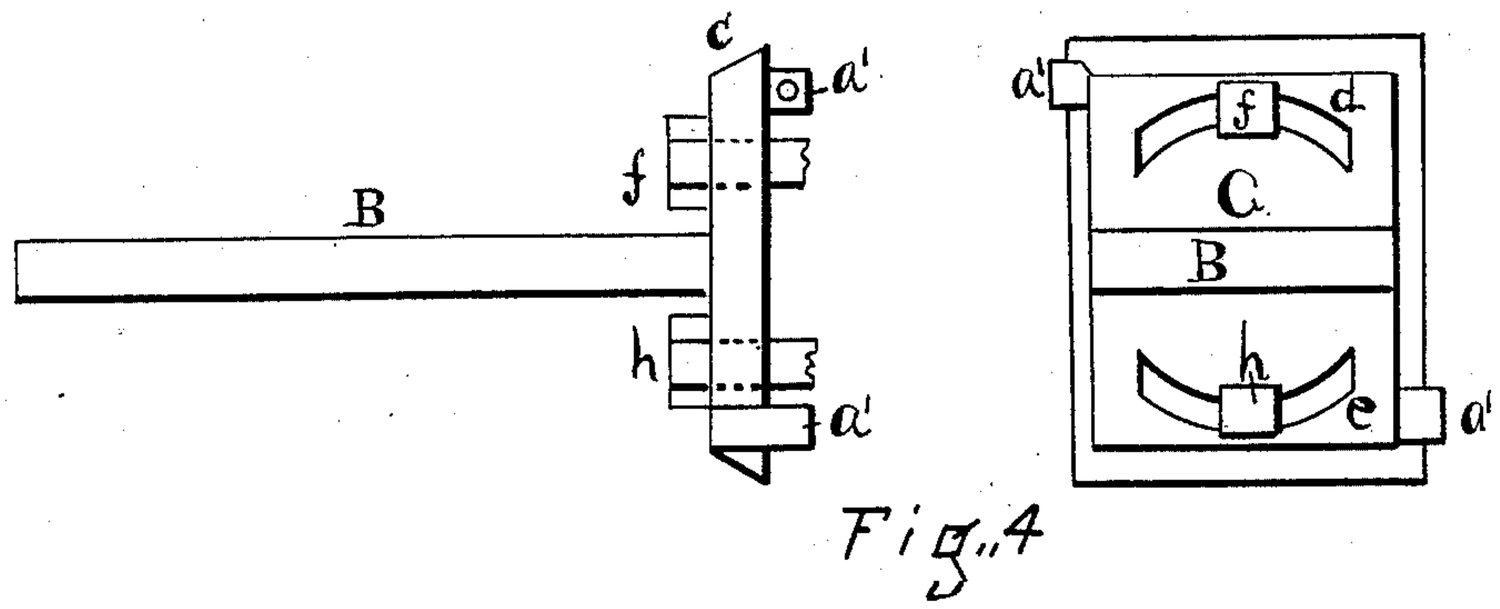

Fig. 4

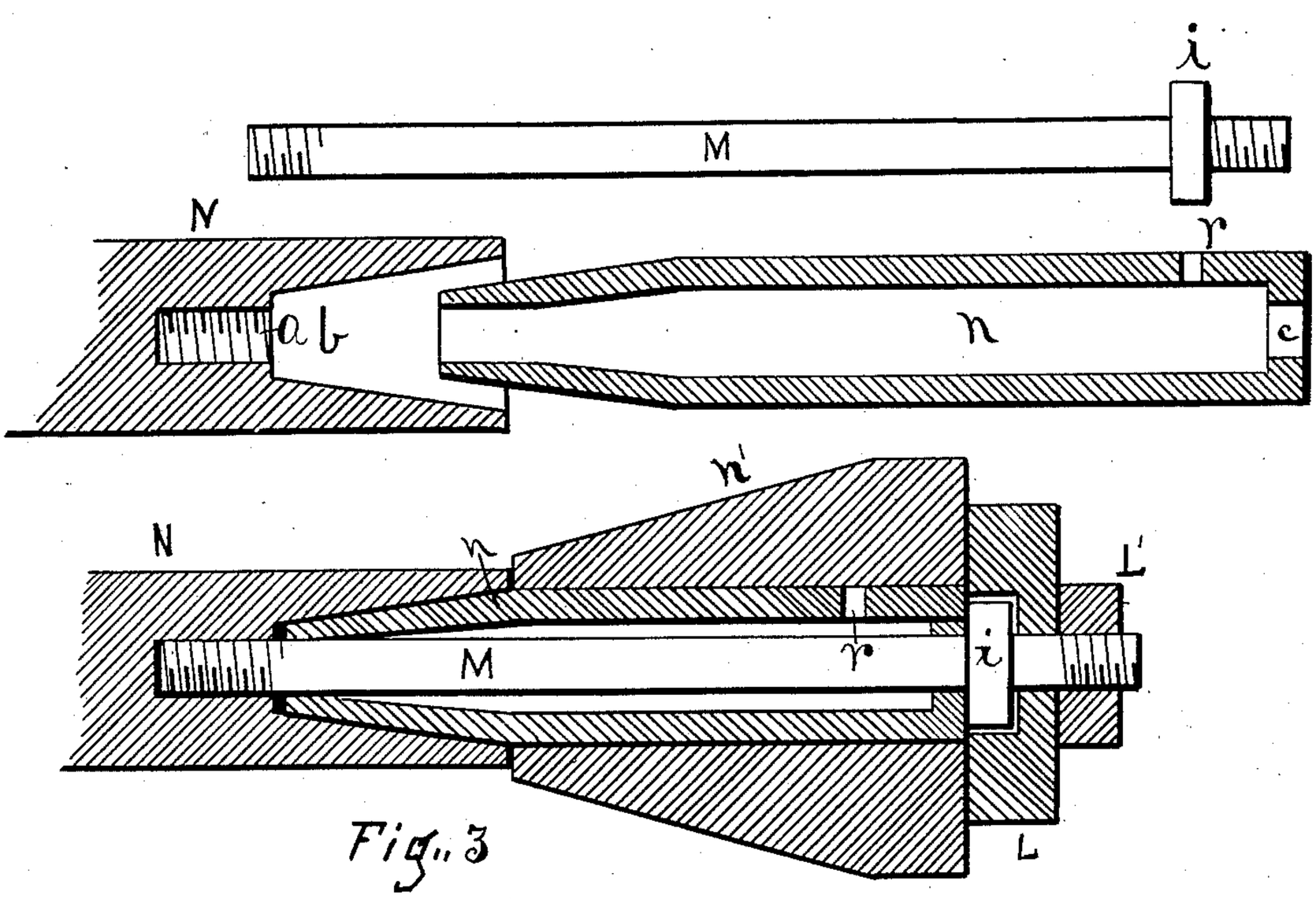

Fig. 3

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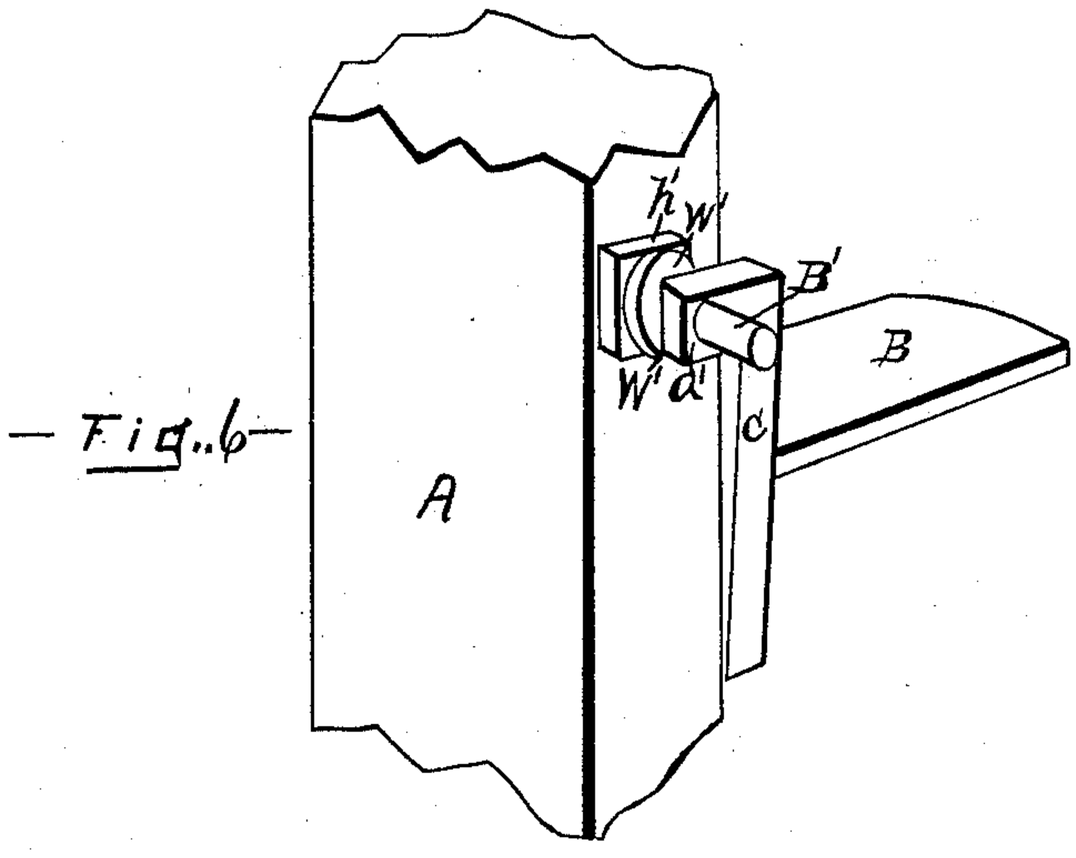
(No Model.) 3 Sheets—Sheet 3.

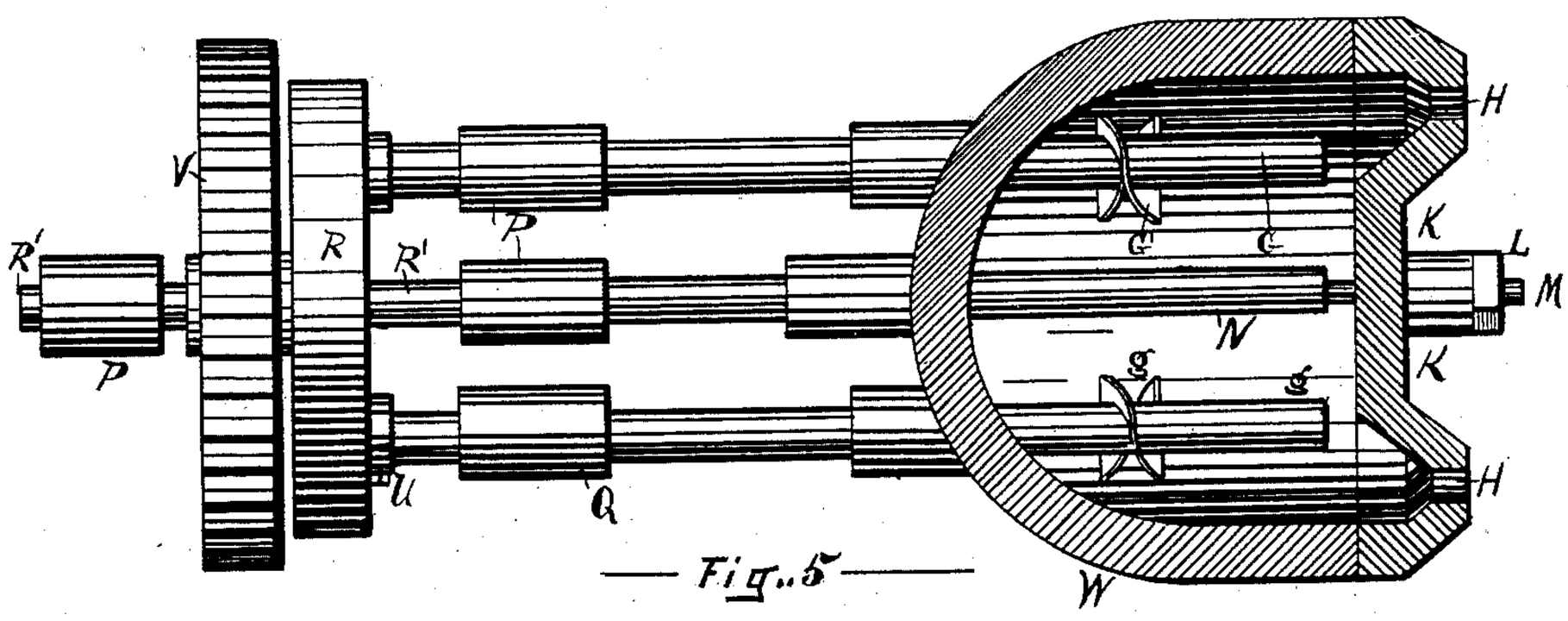
A. L. BREWER & H. HEESEN.

BRICK AND TILE MACHINE.

No. 318,347. Patented May 19, 1885.



— Fig. 6 —



— Fig. 5 —

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UNITED STATES PATENT OFFICE.

ALBERT L. BREWER AND HENDRICK HEESEN, OF TECUMSEH, MICHIGAN, ASSIGNORS TO THEMSELVES, HUDSON W. CONKLIN, CHARLES J. BREWER, AND HERBERT STOUT, ALL OF SAME PLACE.

BRICK AND TILE MACHINE.

SPECIFICATION forming part of Letters Patent No. 318,347, dated May 19, 1885.

Application filed February 25, 1885. (No model.)

To all whom it may concern:

Be it known that we, ALBERT L. BREWER and HENDRICK HEESEN, of Tecumseh, in the county of Lenawee and State of Michigan, have invented a new and useful Improvement in Brick and Tile Machines, of which the following is a specification.

Our invention consists in certain improvements in brick and tile machines, hereinafter fully pointed out in the claims.

Figures 1 and 2 are vertical sections taken at right angles to each other on the lines *x x* and *y y*. Fig. 3 is a section of the end of one of the shafts, showing the core-pin and retaining-bolt both in position and detached. Fig. 4 is a side and end elevation of one of the pugging-knives and fastening-bolts. Fig. 5 is a horizontal section through the lower part of the machine, and Fig. 6 is a perspective of part of the grinding-shaft and one of the pugging-knives.

W represents a cylindrical tub, the upper part of which is used as a pugging-mill, while in the bottom part the clay is forced out by auger-shafts through brick or tile dies. The construction of this tub and the manner of using brick and tile dies are well known.

A represents the pugging and grinding shaft, set vertically in the upper part of the tub, and supported, when no clay is in the machine, by collars which rest upon the bridge-trees in which the upper end of the shaft is journaled. It is driven by a gear-wheel in the usual manner.

B B represent grinding-knives, each of which is cast on a plate, C, in which are two curved slots, *d e*, through which and the shaft pass bolts *f h*, provided at one end with a head, and screw-threaded at the other end to receive a nut. We place two knives B opposite each other on the shaft, and secure them in place by the bolts *f h*, so that the two knives balance each other, and the upward thrust of the clay on the knives is largely thrown on the lower bolt in the form of a tensile strain, instead of upon the shaft. The curved slots *d e* permit the pitch of the knives to be adjusted, and the knives are held in position as to pitch by two lugs, *a' a'*, projecting from diagonally-opposite corners of plate C, and extending on the side of the shaft A. In one of these lugs a hole is made to receive the shank of a bolt, B', having a head, *h'*, which holds the lug away from the shaft, and the distance of the lug from the shaft can be further increased by slipping over the bolt, between the head and the lug, one or more washers, W'. When the shaft is made tapering, it may not be necessary to use either the bolt or washer; but it is always desirable to give the upper knives a greater pitch than the lower knives, and the bolt and washer enable this to be done, whatever the form of the shaft. This construction relieves the bolts *f h* from the duty of holding the knives in pitch. The reason for giving the knives a pitch is that in machines of this class the pugging-knives also act as augers to force the clay down on the auger-shafts which expel it.

F represents an auger or turtle on the lower end of shaft A, to force the pugged clay down on the auger-shafts.

In the lower part of the tub it is customary to put two auger-shafts in a horizontal line and opposite the center of the dies when the machine is used for making small tile, and these shafts carry cores which form the bores of the tile. To make large tile the two auger-shafts are removed and a central auger-shaft substituted carrying a single core. This is objectionable, because it requires time to make the change, and because in making large tile the parts which carry the core heat and are subjected to excessive wear and strain, as the shaft revolves much faster than does the core. We therefore put in the machine a shaft, N, which is simply a core-shaft and does not carry any augers. This shaft may be stationary; or it may be revolved quite slowly—at about the rate of speed at which the core would revolve if placed upon the auger-shaft. We place this shaft between and in line with the two auger-shafts, as shown in Fig. 5, for ordinary clays, and for stiffer clays we place three auger-shafts, G O *g*, in a circle in the lower part of the machine, and place the shaft N in the center of

this circle. Each of these shafts carries augers G′ O′ *g*′, made in sections, only one section being shown in the drawings.

V represents a large gear-wheel, which is clamped onto the hub of a large gear-wheel, R, having internal gear, and hung on a shaft, R′, journaled in suitable bearings, P. The auger-shafts G O *g* run in suitable bearings at the rear side of the tub, and in other bearings, two of them being represented by P′ Q, formed on the frame of the machine. Each auger-shaft carries at its rear end a pinion, which meshes with wheel R, S and T representing the pinions for shafts G and O. As shaft *g* does not appear in Fig. 2, its pinion is not shown. Pinion T is fastened to shaft O by a slot and feather, so that it can slide on said shaft, and is held in place by a set-screw, U, in its hub, so that said pinion can be slid out of gear with wheel R when it is not desired to run shaft O. In the end of each shaft is bored a tapering hole, *b*, and at the bottom of this hole is bored a smaller hole, *a*, which is screw-threaded.

n represents a core-pin having one end beveled at the same angle as hole *b* and made hollow.

c represents a hole through the core-pin.

M represents a retaining-bolt screw-threaded at both ends, and having a shoulder, *i*, near one end, octagonal or of other proper form to afford hold for a wrench by which said bolt can be screwed into the hole *a*.

L′ represents a nut which screws on one end of the bolt M, and L represents a washer having a recess cut therein to clear shoulder *i*, which slips over bolt M and presses against the end of the core-pin *n* and core *n*′, thereby holding them in place when the nut L′ is screwed into place.

r represents a small hole through the wall of the core-pin, to permit oil placed in the core-pin to pass out and lubricate the outer surface thereof, and can be used or not, as desired.

To secure the core-pin to the end of the shaft the beveled end thereof is inserted into the tapered hole *b*, and the bolt M passed through the core-pin and screwed into the hole *a*, when the core-pin will be drawn into line with the shaft, whether the hole *a* and bolt M are perfectly in line with the shaft or not, the hollow through the core-pin being somewhat larger than the bolt, and the adjustment being effected by the exact meeting of the two bevels. This construction therefore obviates the difficulty of tapping the retaining-bolt into the shaft in perfect line.

When we desire to make small tile, under six inches, we fasten a double die to the machine opposite the auger-shafts G *g*, and secure to the ends of each of said shafts a core, as shown in Fig. 3, when the machine is ready to make two streams of tile. If the third auger-shaft, O, is in the machine, its pinion is thrown out of gear with wheel R, as above described. To make large tile, from six to fifteen inches, the cores are taken off from the auger-shafts, and a large core, K, is fastened to shaft N, a die of suitable size being secured to the machine opposite said shaft. If three auger-shafts are used in the machine, they are all set in operation and the clay forced through the die around the core carried on shaft N. Where the clay to be worked requires only two auger-shafts, and the machine is so made, we place the said auger-shafts and the shaft N in line, as shown in Fig. 5. The combined effect of the two or three auger-shafts distributes the clay evenly all around the die and makes a firm, solid tile, while as the core-shaft N revolves either not at all or only with the same speed as the core, there is no friction between the core-pin and core and no strain on and heating of those parts or of the nut which holds the core and core-pin in place.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. In a brick-machine, the combination of a core-shaft to support a cone in position and two or more auger-shafts arranged relatively to the core-shaft to act upon the core carried thereby, substantially as described.

2. In a brick and tile machine, the combination, with a core-supporting shaft, of three auger-shafts arranged around said core-shaft in a circle, substantially as shown and described.

3. In a brick and tile machine, the combination of a shaft having a beveled hole in its end, and a screw-threaded hole tapped therein at the bottom of said beveled hole, with a removable hollow core-pin having one end beveled on the same angle as the hole in the end of said shaft, and a retaining-bolt adapted to pass through said hollow core-pin and screw into the threaded hole in said shaft, substantially as shown and described.

4. The combination of the auger-shaft G, having therein the beveled hole *b* and the threaded hole *a*, with the removable holl w core-pin *n*, having the hole *r* through the wall thereof, and the bolt M, screw-threaded at both ends, and having thereon the wrench-shoulder *i*, substantially as shown and described.

5. In combination with the grinding or pugging shaft of a brick and tile machine, pugging-knives each cast on a plate having therein two curved slots, and bolts adapted to pass through the slots in said plates and through said shaft, substantially as and for the purposes set forth.

6. In a brick and tile machine, the combination of the shaft A with the knives B, each cast on a plate, C, having therein the two curved slots *d e*, and also having thereon the lugs *a*′, substantially as shown and described.

7. The combination of the shaft A, knives B, each cast on a plate, C, having thereon the

lugs a', and the bolt B', substantially as shown and described.

8. In combination with the gear-wheel R, the three auger-shafts G O g, each carrying a pinion adapted to gear with said wheel R, the pinion on said shaft O being movable, as shown, whereby said pinion may be thrown out of gear with said wheel R, substantially as shown and described.

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