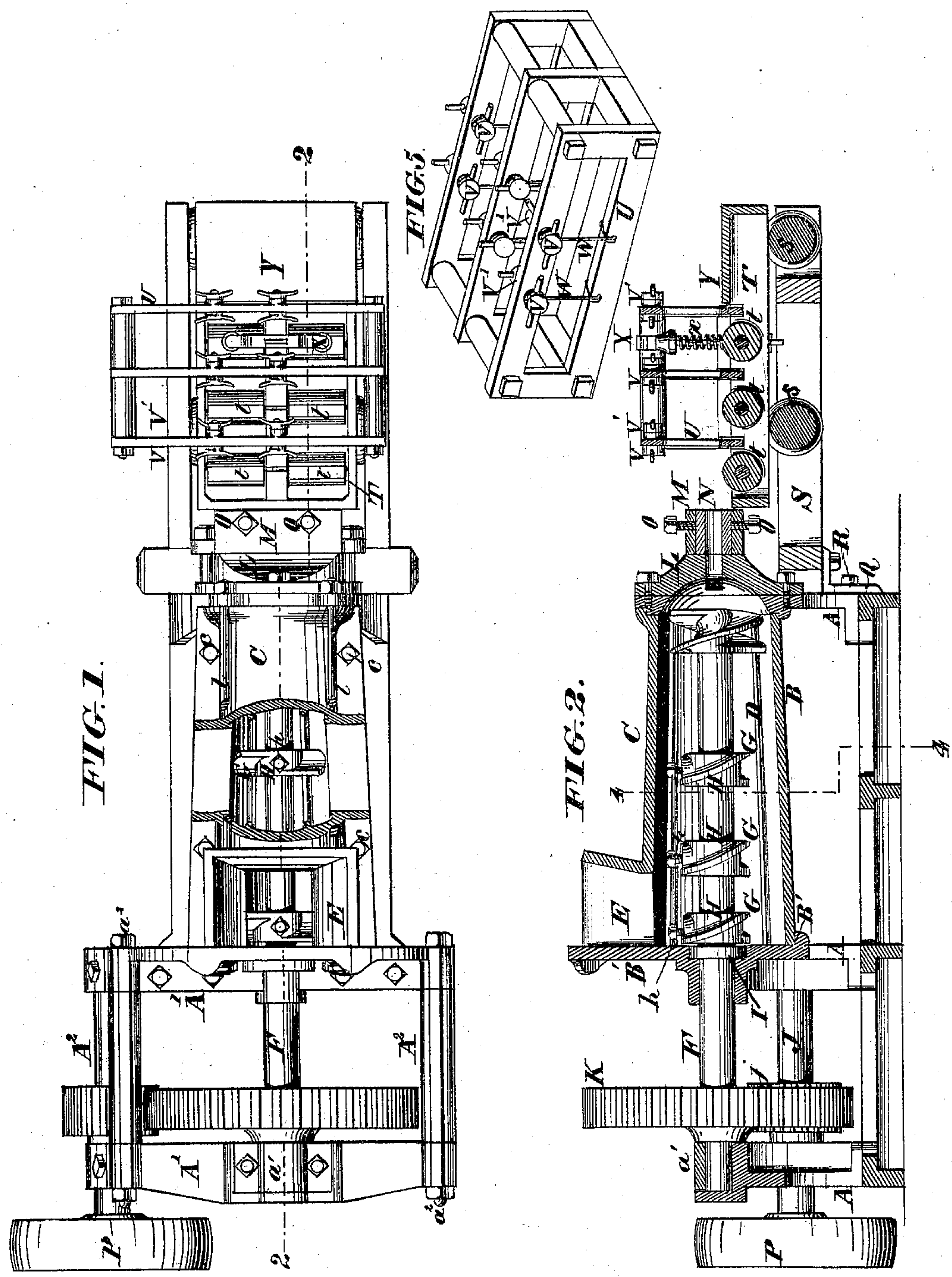


P. H. KELLS.  
BRICK AND TILE MACHINE.

No. 177,851.

Patented May 23, 1876.



WITNESSES.  
*Chas J Gooch*  
*Le Blond, Burdett*

INVENTOR.  
*Philip H. Kells*  
By *Knights & Co* Attorney

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FIG. 3.

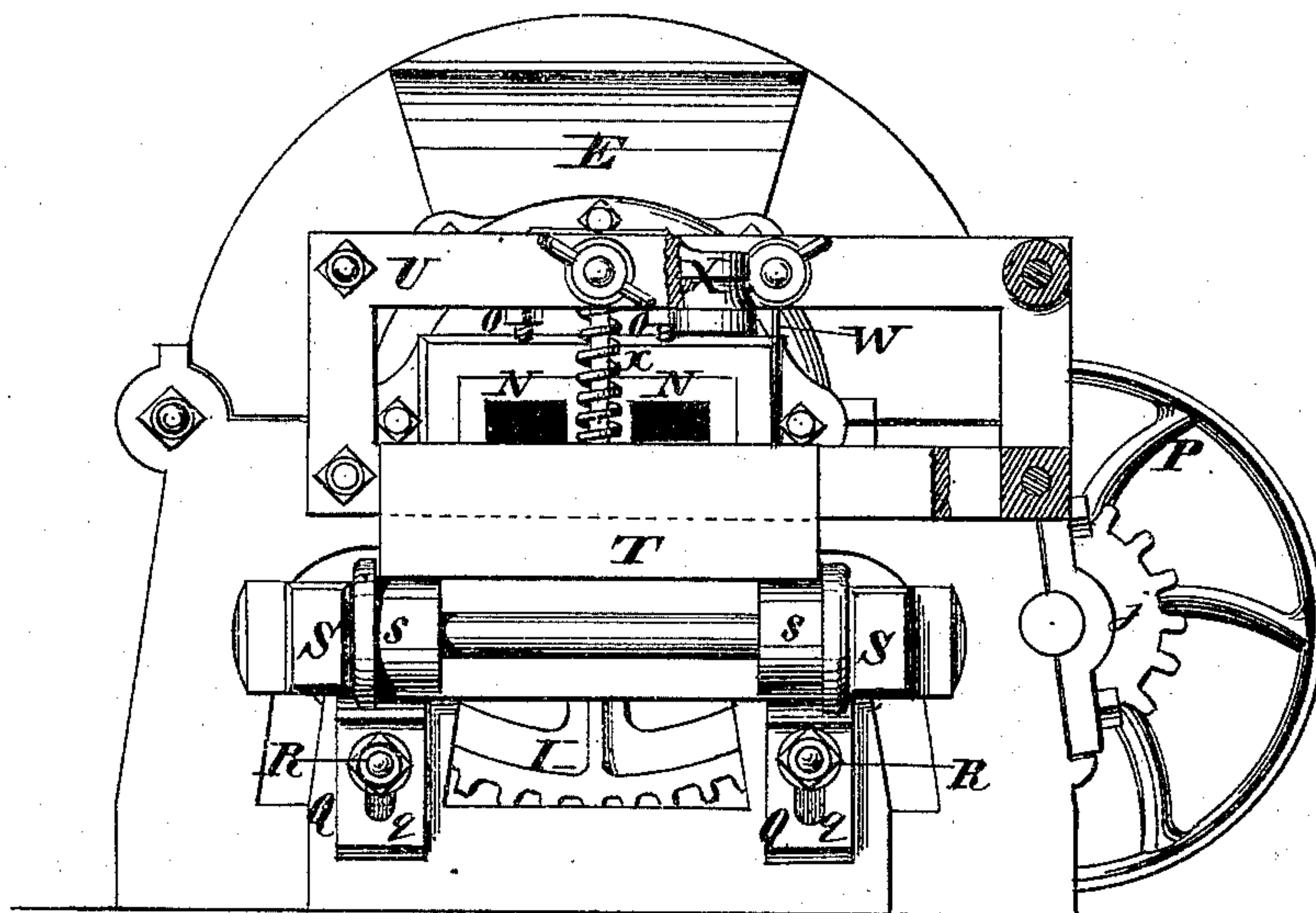
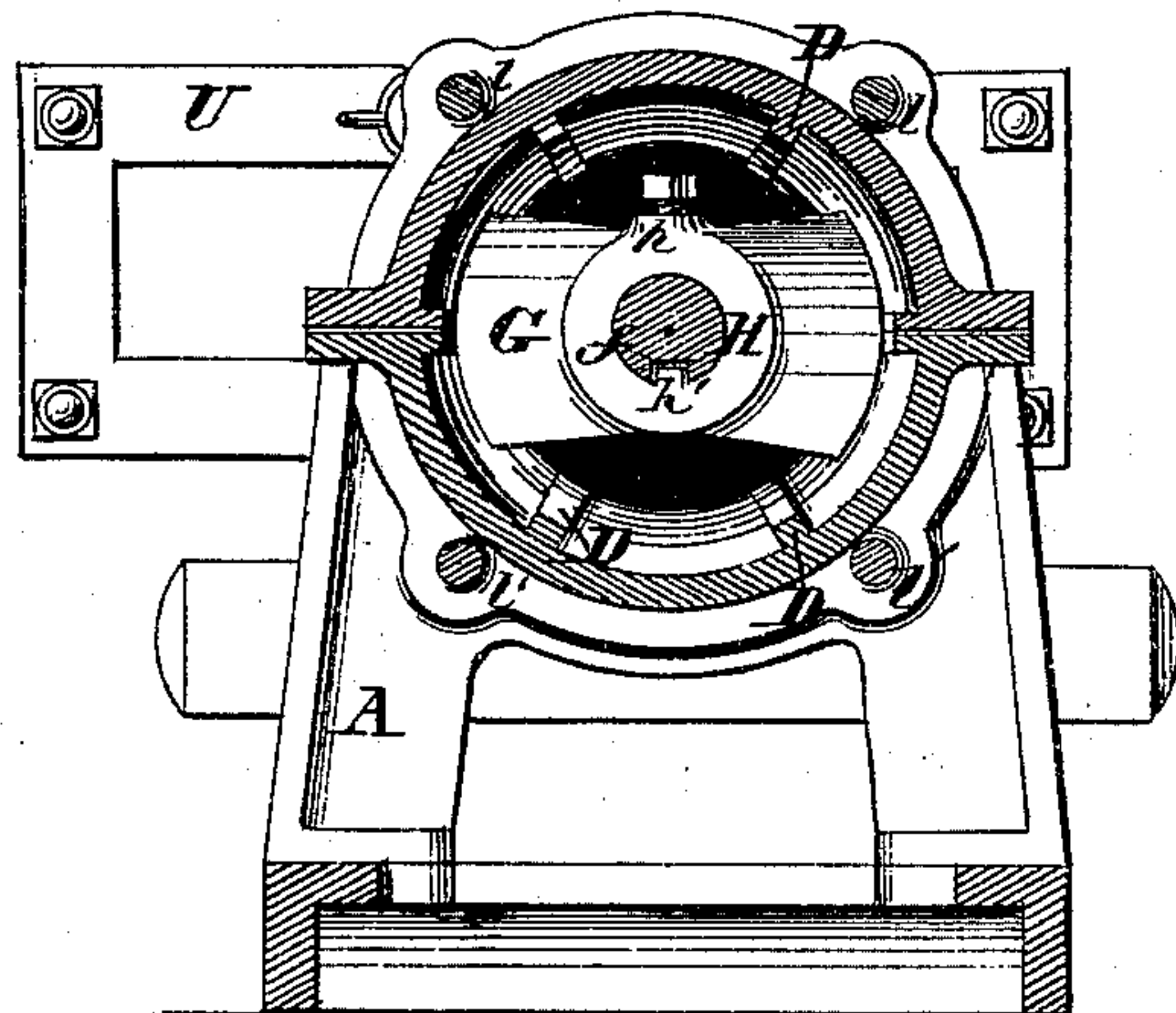


FIG. 4.



WITNESSES

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# UNITED STATES PATENT OFFICE.

PHILIP H. KELLS, OF ADRIAN, MICHIGAN.

## IMPROVEMENT IN BRICK AND TILE MACHINES.

Specification forming part of Letters Patent No. 177,851, dated May 23, 1876; application filed March 9, 1876.

*To all whom it may concern:*

Be it known that I, PHILIP H. KELLS, of Adrian, in the county of Lenawee and State of Michigan, have invented a certain new and useful Improvement in Brick and Tile Machines, of which the following is a specification:

My machine is constructed with a horizontal grinding-shaft, grooved longitudinally for the reception of spiral blades fixed adjustably thereon. The casing is constructed in parts, divided horizontally, the lower part being attached permanently to the frame, and the upper separable, to permit the removal of the shaft. The boxes and upper portion of the frame are also removable for the same purpose, so that the shaft may be rolled out of its bed horizontally without the labor of elevating the heavy master-wheel attached thereto. The end thrust of the shaft is sustained by a collar working in a chamber made in part in the base and in part in the top of the middle plate. The interior of the casing is ribbed longitudinally, to prevent the clay partaking of the rotary movement of the shaft. The clay is delivered in continuous lengths, through movable dies, which are changed to correspond with the section of the bricks desired, and is received on a roller-frame capable of a reciprocating longitudinal motion, adjustable in height to correspond with the dies. The columns of clay are held by a clamp, while the bricks are separated by wires carried by a transversely-moving frame. The delivery-dies are elastic, and are capable of being pressed inward in the center by set-screws, so as to form bricks with prominent corners and concave center parts.

In the accompanying drawings, Figure 1 is a plan of the machine, partly in section. Fig. 2 is a vertical longitudinal section on the line 2 2, Fig. 1. Fig. 3 is a rear elevation. Fig. 4 is a transverse section on the line 4 4, Fig. 2. Fig. 5 is a perspective view of the transversely-moving cutting-frame.

A A represent various parts of the stationary base, and B the bed or lower portion of the casing, which is permanently fixed thereto. C is a removable cap, forming the upper portion of the casing, being fixed to the lower part by bolts c. On the interior of the casing

are any necessary number of longitudinal ribs, D. The casing tapers, as represented, from front to back, and is provided on top, at its receiving end, with a hopper, E, through which the clay is introduced.

F is the main shaft, carrying spiral blades G, which are attached to heads or collars H, secured adjustably on the shaft by set-screws h. A longitudinal groove, f, in the shaft F receives lugs h', projecting inward from the heads or collars H, so as to cause the collars and blades to rotate with the shaft. The end thrust of the shaft is sustained by a fixed collar, I, thereon, occupying a recess prepared for it in the middle plate B'. The shaft is driven, by any suitable motor, by means of a pulley, P, or other connection, on a shaft, J, carrying a pinion, j, which gears with the master-wheel K on the main shaft F. The shaft has its bearings in transverse beams A<sup>1</sup> A<sup>1</sup> of the main frame, and is confined by a cap-plate, a<sup>1</sup>. The longitudinal girts A<sup>2</sup> A<sup>2</sup> of the frame are removable, to admit of the master-wheel and shaft being unshipped horizontally without lifting them bodily over the frame when the casing-cap and the bearing-caps of the shaft are taken off. To this end the said girts are made hollow, and secured in the frame by screw-bolts a<sup>2</sup> a<sup>2</sup>.

The delivery end of the casing is constructed with a throat plate or cap, L, screwed or bolted to the rear plate B, which is connected to the middle plate B' by bolts l l. The upper bolts l l are removed when the casing is to be opened.

M is a delivery-nozzle or nose-plate, within which are dies N, arranged side by side, formed and adapted to cause the delivery of the clay in two columns corresponding in section to the bricks to be produced. The dies N are changeable, so as to produce bricks of any size, and are held in position by set-screws O, which, bearing on the center part of the die, press it inward, so as to produce concavities at the centers of the bricks, and leave the corners permanent.

Q Q are brackets secured to the rear end of the frame by set-screws or clamps R, occupying slots q in the said brackets, so that the latter are adjustable in height. The brackets Q support a horizontal frame, S, in which are flanged rollers s for the support of the roller-



frame T, which is free to move longitudinally, so that it may partake of the movement of the clay, while the latter is clamped upon it for the cutting of the bricks, as hereinafter described. The rollers  $t$ , in this reciprocating frame are, at their upper parts, on a level with the bottoms of the apertures in the dies N. The vertical adjustability of the frame S, by means of the slotted brackets Q, admits of setting it up or down to cause the rollers to correspond in position with the particular dies in use.

U represents a transversely-reciprocating frame, constructed with three (more or less) sets of horizontal bars, between which are stretched vertical wires W. The upper end of each wire is wound on a key, V, to provide for the tightening of the wire, the key being securely held by a clamp-nut, V', fitted on the screw-shaft of the key.

X is a clamp, which is held up by a spring,  $x$ , and is employed, when pressed down on the two columns of clay, to hold them against lateral motion while being cut.

The severed bricks are received on a table, Y, from which they are conveyed by hand, or in any preferred manner.

By the use of two sets of receiving-rollers,  $t$ , one for each column of clay, each column is allowed to progress independently of the other, so that when, as it generally happens, one column advances faster than the other, the surface of the pressed clay and the straightness and symmetry of the column are not marred by friction against the rollers. The clamp X is of great utility to hold the columns of clay against lateral movement when the bricks are severed. Without this the clay is liable to be pressed over sidewise, and thus will not be cut straight across.

My construction of thumb-keys for tightening the wires and jam-nuts or clamps for locking them is greatly superior to the common tightening-screws, which require the use of a wrench. By my device I am enabled to tighten the wires at any time when the machine is running.

The set-screws O, acting on the centers of the dies N, not only enable the operator to make the surfaces of the column concave, but are useful for the purpose of preventing the center part of the column from running out too fast.

The machine is well adapted for manufacturing tiles, either open or tubular, a suitable core-die being employed to form the cavity

or the bore, as the case may be, in customary manner.

The machine tempers the clay for itself, and operates with perfect success on clay introduced in its crude state as taken from the bank, sand being added, if desired.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. The removable girts  $A^2$ , bolts  $a^2$ , journal-caps  $a^1$ , and casing-cap C, constructed and applied, substantially as described, to facilitate the removal of the shaft and master-wheel.

2. The two-part back-plate B', in combination with the shaft F and collar I, the latter fitting within a chamber in the said back-plate, as explained.

3. The combination of the frame S, supported adjustably by means of brackets Q, with rollers to carry the columns of clay, and dies N, removable and changeable, to produce bricks or tiles of different sizes or sections, as explained.

4. The combination of the supporting-frame S, having rollers  $s$   $s$ , and the longitudinally-sliding roller-frame T, as and for the purposes set forth.

5. The combination of the nose-piece M, dual dies N N, and the roller-frame T, provided with two parallel independent sets of cylindrical carrying-rollers  $t$   $t$ , all constructed and operating as and for the purposes set forth.

6. The combination of the longitudinal carrying-frame T, the transverse cutting-frame U, and the clamp X, for holding the bricks while being cut, as explained.

7. The combination, in the cutting-frame U, of the vertical wires W, horizontal keys V, and jam-nuts V', as and for the purposes set forth.

8. The combination of the elastic forming-dies N, and the set-screws O O, bearing on the upper and under sides of said dies to compress and contract their central parts, as explained.

9. The combination of the tapering horizontal casing B C, longitudinally-grooved shaft F, oblique knives G G, heads H, legs  $h$ , and screws  $h'$ , nose-piece M, and double delivery-dies N N, all constructed and arranged to operate as and for the purposes set forth.

PHILIP H. KELLS.

Witnesses:

WILLARD STEARNS,  
JOHN M. MUELLER.

17 50