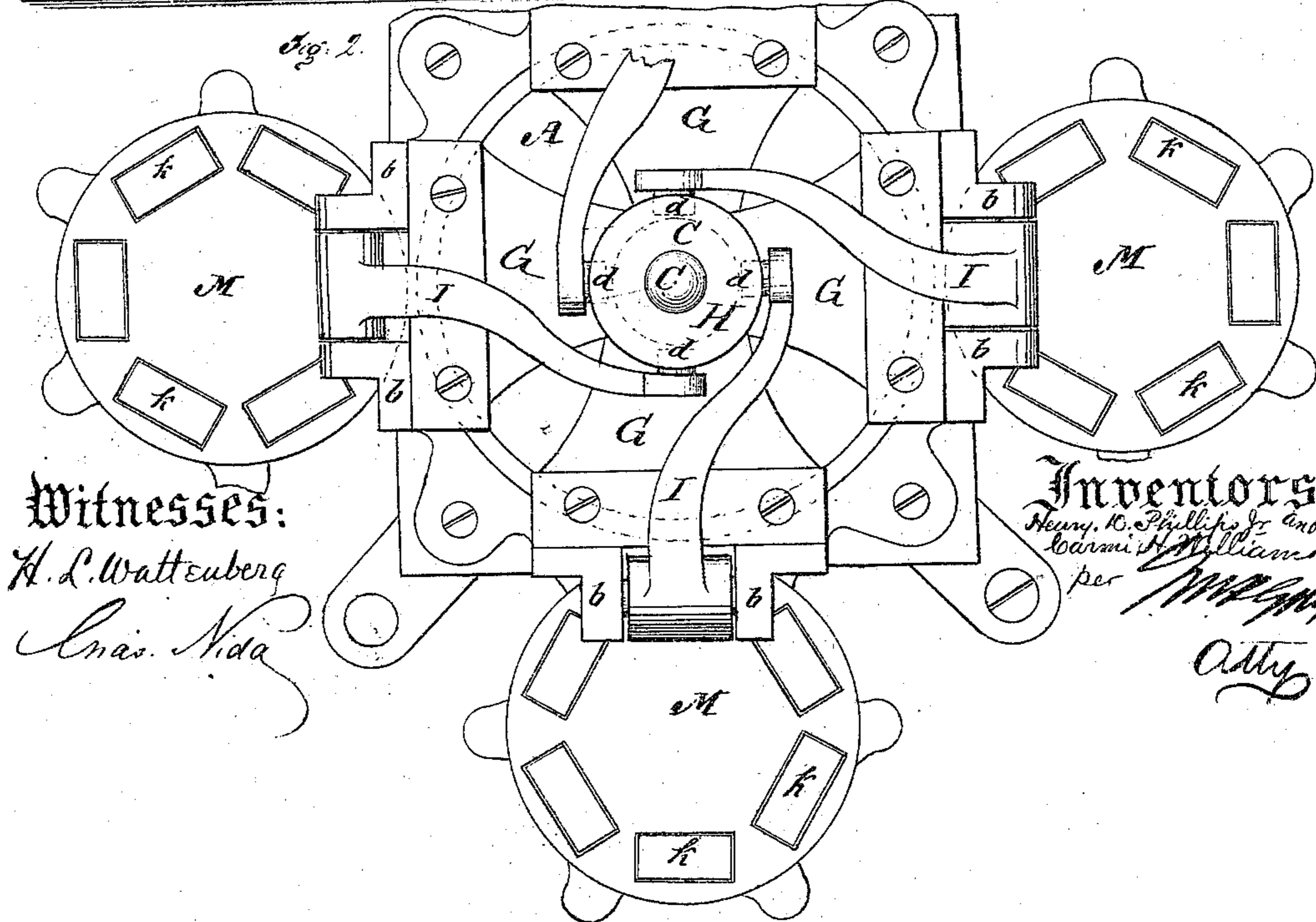
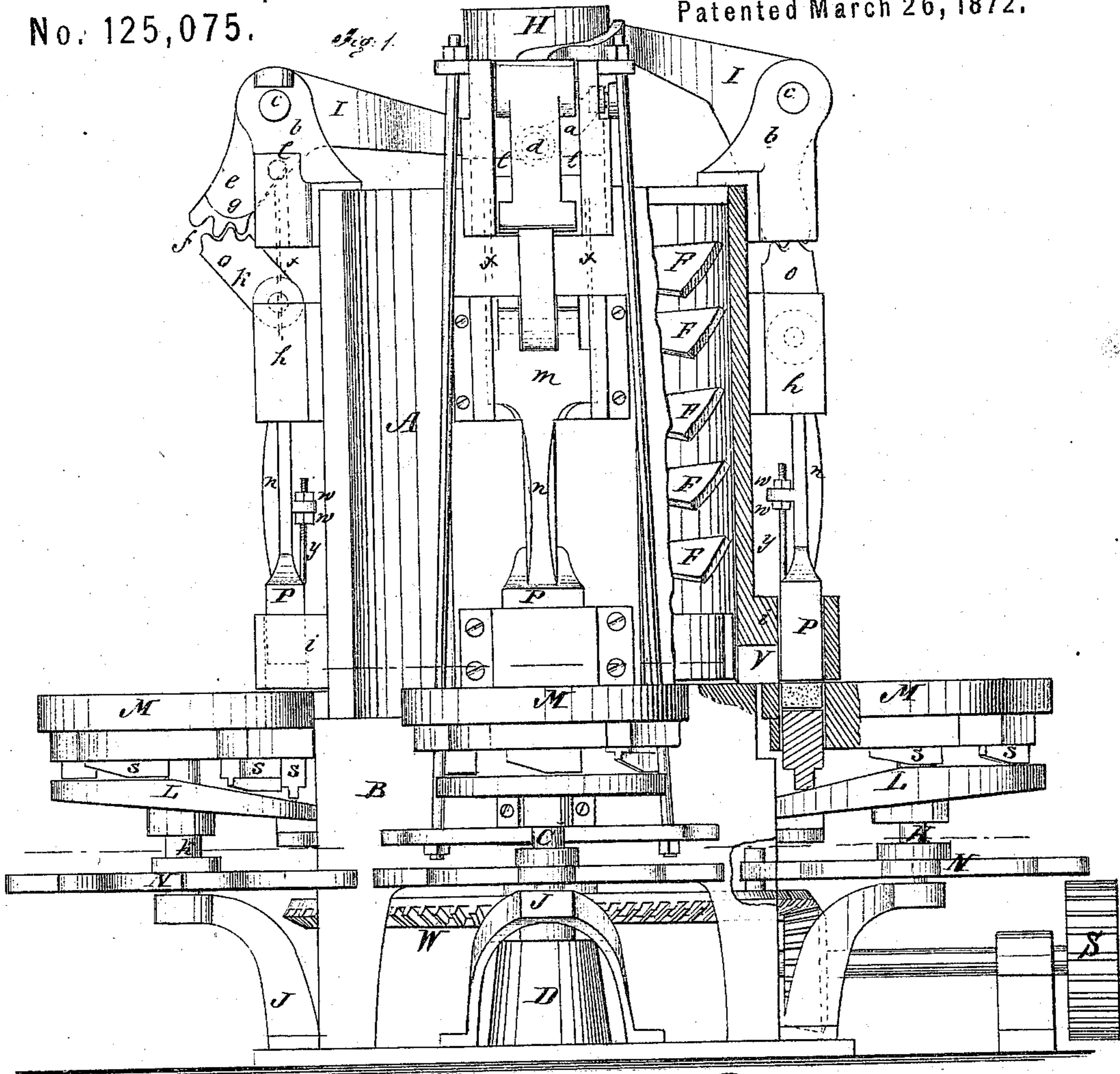


H. D. PHILLIPS, Jr., & C. H. WILLIAMS.

Improvement in Brick Machines.

No. 125,075.

Patented March 26, 1872.



Witnesses:
H. L. Wattenberg
Chas. Nida

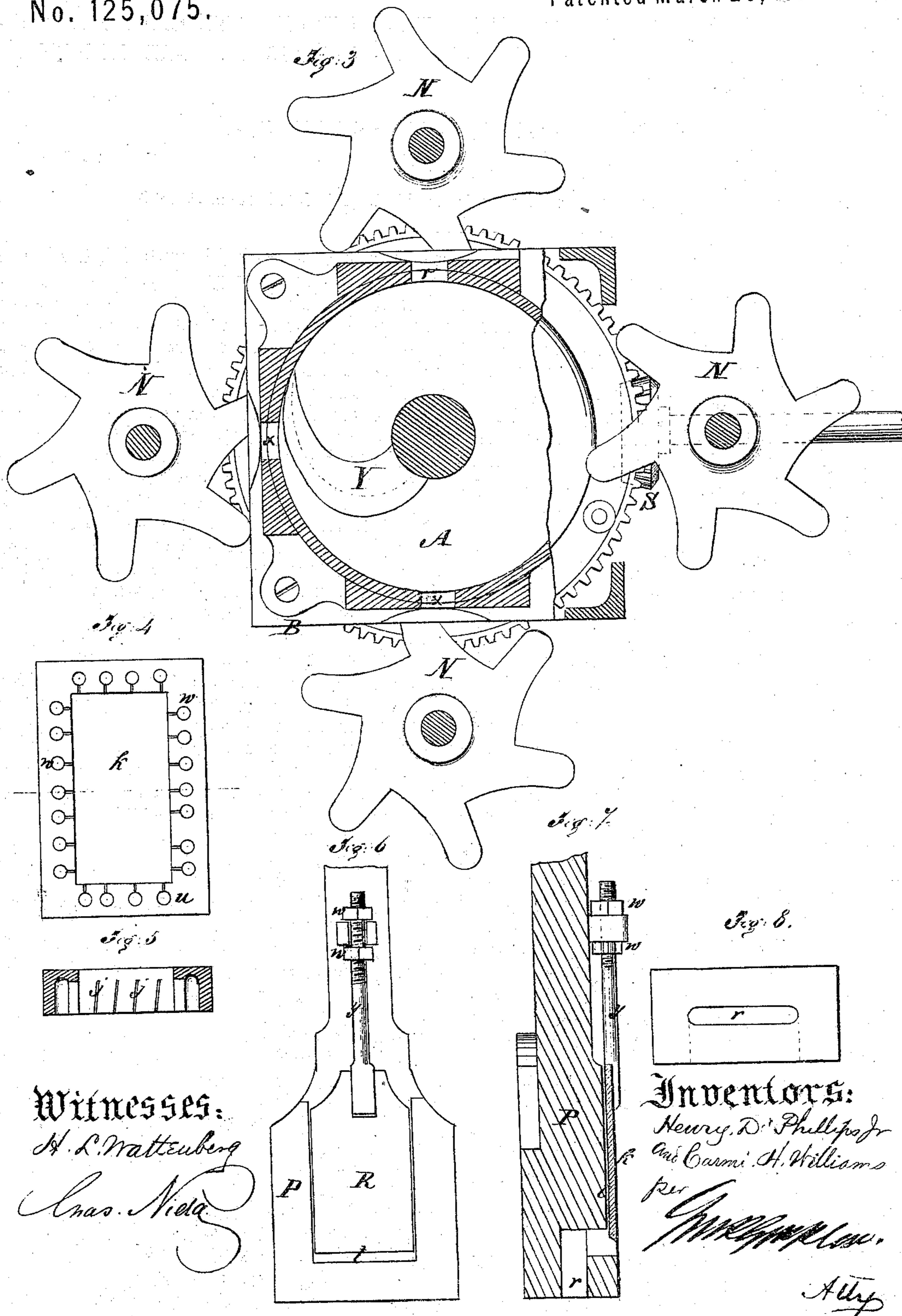
Inventors:
Henry D. Phillips, Jr. and
Charles H. Williams
per *[Signature]*
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UNITED STATES PATENT OFFICE.

HENRY D. PHILLIPS, JR., OF TRENTON, NEW JERSEY, AND CARMI H. WILLIAMS, OF MATTEAWAN, NEW YORK, ASSIGNORS TO SAID HENRY D. PHILLIPS, JR.

IMPROVEMENT IN BRICK-MACHINES.

Specification forming part of Letters Patent No. 125,075, dated March 26, 1872.

To all whom it may concern:

Be it known that we, HENRY D. PHILLIPS, Jr., of Trenton, in the county of Mercer and State of New Jersey, and CARMI H. WILLIAMS, of Matteawan, in the county of Dutchess and State of New York, have invented a new and Improved Brick-Machine; and that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing and to the letters of reference marked thereon making a part of this specification.

The subject of this invention is an improved machine for making bricks; and the invention consists in the combination of a hollow plunger and adjustable gate, and in a peculiar construction of the molds, whereby the surplus water is permitted to escape from the mold while the brick is being pressed, together with the general construction, arrangement, and combination of parts, as herein fully described.

In most, if not all, of the brick-machines heretofore constructed no adequate provision has been made to allow the surplus clay and water to escape while the clay is being subjected to pressure, the result being, in some instances, the breaking or disarrangement of the machinery and leaving the bricks so charged with water after they leave the molds as to require an unusual time to dry them, besides rendering them liable to shrinkage in a great degree; and in most, if not all the machines for making bricks before made, expensive and cumbrous machinery, full of vulnerable parts, has been thought necessary to accomplish the object sought. It is believed that the machine and the parts thereof which are the subject-matter of the invention herein described, obviate in a great measure, if not entirely, the many objections that have been raised against brick-making machines.

In the accompanying sheets of drawing, Figure 1 represents a side elevation of our invention; Fig. 2, a plan or top view; Fig. 3, plan of under side; Fig. 4, plan view of mold; Fig. 5, cross-section of same; Fig. 6, front elevation of plunger; Fig. 7, edge view; and Fig. 8, plan view of under side of same.

Similar letters of reference indicate like parts in the several figures.

A represents an upright cylinder, made from

cast-iron or other suitable material, the lower part of which is securely bolted to the base B. Within, and in a line with the central axis of this cylinder, is fitted a shaft, C, the lower end of said shaft passing through the cylinder A and base B into the step D. That part of the shaft that is within the cylinder A has secured to it the radial wings F, set at a slight pitch or angle to said shaft. (See Fig. 1.) That part of the shaft which projects above the cylinder, after passing through the guides G, has keyed to it a cam, H, with a spiral slot, *a*, formed therein. Cast or otherwise secured to the cylinder A are lugs *b*, and between the jaws of said lugs are fitted levers I by a pivotal bolt, *c*, in such manner as will allow said levers to turn freely between said jaws. The inner ends of said levers are provided with studs *d*, which move in the spiral slot *a* of the cam H, and the outer ends *e* of said levers are bent at an angle somewhat less than a right angle, and there are formed on the ends thereof spurs or corrugations *f*. On the sides of the outer part *e* of each lever I is cast a curved track or cam, *g*. Onto the cylinder A, and below the lug *b*, are cast or bolted slides or guides *h*, and below said guides are cast or bolted boxes *i*. Springing from the foot of the base B are brackets J, which form supports for the shafts K, which pass upward and through angular plates L, and to the upper end of said shafts are firmly secured the mold-wheels M, and secured to said shafts, immediately above the brackets J, are star-wheels N. Each mold-wheel M is provided with a series of rectilinear openings or molds, *k*, of the exact size it is desired the bricks shall be. Snugly fitting into and passing through each box *i* is a plunger or compress, P, which is connected with a cross-head, *m*, by the stem or connecting-rod *n*. This cross-head is provided with jaws, which receive the lower end of a lever, *o*, which is bolted so as to turn freely between them, and the cross-head is confined in position by and slides freely on the guides *h*. The upper end of the lever *o* is provided with spurs or corrugations corresponding to the spurs or corrugations *f* in the end *e* of the lever I. Accurately fitting into the molds *k* are mold-blocks *s*, the lower edge of said mold-blocks having

angular faces. The lower end of the plunger or compressor P has a slot, *r*, formed therein, communicating or opening into a slide-way, *t*, formed in the front surface of the punch or compressor. This slide-way is provided with a gate, R, which may close entirely, or to some extent, said slide-way, the opening and closing being regulated by the set-nuts *w w*, working on screw-threads formed on the upper end of the gate-stem *y*.

Having now described the construction of the several parts of our machine, its operation is as follows: Power being applied to the lower end of the shaft C by means of the gear-wheels S S, or in any other desirable manner, the wheel W, keyed to the shaft C, is made to revolve, which in turn causes said shaft to revolve. A charge of clay, of the proper consistency, is put into the cylinder A, where, by the revolving action of the wings F and the set or pitch which they have, (before referred to,) the clay is worked down to the base of the cylinder, finding exit through the opening *v* into the box *i*, the punch or compressor P having in the mean time been raised sufficiently to uncover said opening by the action of the studs *d* in the spiral slot *a* of the cam H. These studs being attached to the end of the lever I, as before stated, necessarily raise and lower said lever as the shaft revolves. This causes rods *x* (attached to the cross-head *m*) to be raised by reason of its upper end being provided with a stud, *l*, which travels on the inclined surface of the cam *g*. The lower end of said rod being secured to the cross-head, as aforesaid, draws the punch or compressor from the box *i*. The moment the clay is forced into the box *i* the action of the studs *d* in the spiral slots *a* causes the end of the lever I to be forced up, throwing in the end *e* thereof, the spurs of which are meshed into the spurs in the end of the lever *o*, producing a powerful application of leverage power, which forces the punch or plunger P into the box *i* and mold *k* and the clay contained therein, compressing the clay in said molds into a state of great density; said plunger being immediately thereafter withdrawn to allow the air in said compressed clay to expand and also to clear the mold-wheel in time for its next revolution. As the clay is forced into the molds the mold-blocks *s* are forced down until they rest on the slabbed or angular face of the plate L. By the action of a stud, *p*, on the upper surface of the wheel W, which comes in contact with the radial arms of the star-wheel N, said star-wheel is forced around a distance equal to the distance between two of the molds *k* in the wheel M. Of course, as the star-wheel is forced around, the said mold-wheel is likewise forced around, both being keyed to the same shaft K, so that, as soon as one mold has been charged, as before mentioned, another mold is presented to the action of the compressor P, and the mold already charged passes away, forcing the angular face of the mold-

blocks *s* up the inclined face of the plate L until said mold-blocks are by this action again forced into the molds, driving the newly-formed brick out of the molds, ready to be removed on an endless belt or by any desirable means.

We should have stated that as the clay in the cylinder is forced into the box *i*, a wiper, Y, keyed to the lower part of the shaft C, severs the clay in the cylinder from the clay in the box.

One of the chief merits of our invention lies in the construction and arrangement of the compressor P, which, as before stated, has a slot, *r*, formed in its lower edge. The object of this slot is to allow any dry surplus clay to escape from the box *i* or mold through said slot and out of the slide-way when the compressor descends, by this means allowing the full force of the compress to be exerted on the brick without hindrance, and preventing any serious shock and disarrangement of the machinery from the choking of the mold.

To adjust the slide-way to about the exact amount of surplus clay the box or mold is likely to contain, the gate R is provided and arranged with set-screw *w w*, by means of which the area of the outlet may be increased or diminished.

Another important feature in our invention is providing the molds *k* with a series of small channels, *j*, opening from the inside of the molds into apertures *u u*, through which the surplus water in the clay may be forced and allowed to escape as the punch or compressor descends, in this way not only making the brick more solid, but at the outset getting rid of a large amount of moisture that otherwise would have required long exposure to sun and air to expel.

We have herein shown and described a series of mold-wheels, compressors, and their several necessary parts attached around one cylinder, having sufficient capacity to supply the several molds; and the several sets of machinery above named being attached to and operated by the same shaft and cam, great compactness, and economy of space, and cost of construction are attained. Of course, if desired, the machine may comprise but a single set of mechanism and still be on the same principle and possess equal or the same advantages, except as to capacity.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a brick-machine, the molds constructed with channels and apertures, as and for the purpose described.

2. The combination, in a brick-machine, of the hollow plunger with the toggle-levers *o e*, lever I, and cam-wheel H, as and for the purpose described.

3. In a brick-machine, the combination of the mold and the pressing plunger with the rods *x*, stud *l*, and cam *g*, in the manner, and for the purpose described.

4. In a brick-press, the combination of the hollow plunger with the adjustable gate, substantially as shown and described.

5. In a brick-machine, the toggle-levers *o e*, in combination with the hollow plunger and the adjustable gate R, as and for the purpose described.

6. The combination of the cogged or spurred levers *o e* with the hollow plunger and adjustable gate R of a brick-machine, as and for the purposes described.

7. The combination of a pug-mill with the cam, levers, punch, mold-wheel, mold-blocks, angular-faced plate, and star-wheel, in the manner and for the purpose hereinbefore described.

HENRY D. PHILLIPS, JR.
CARMI H. WILLIAMS.

Witnesses:

H. L. WATTENBERG,
G. M. PLYMPTON.