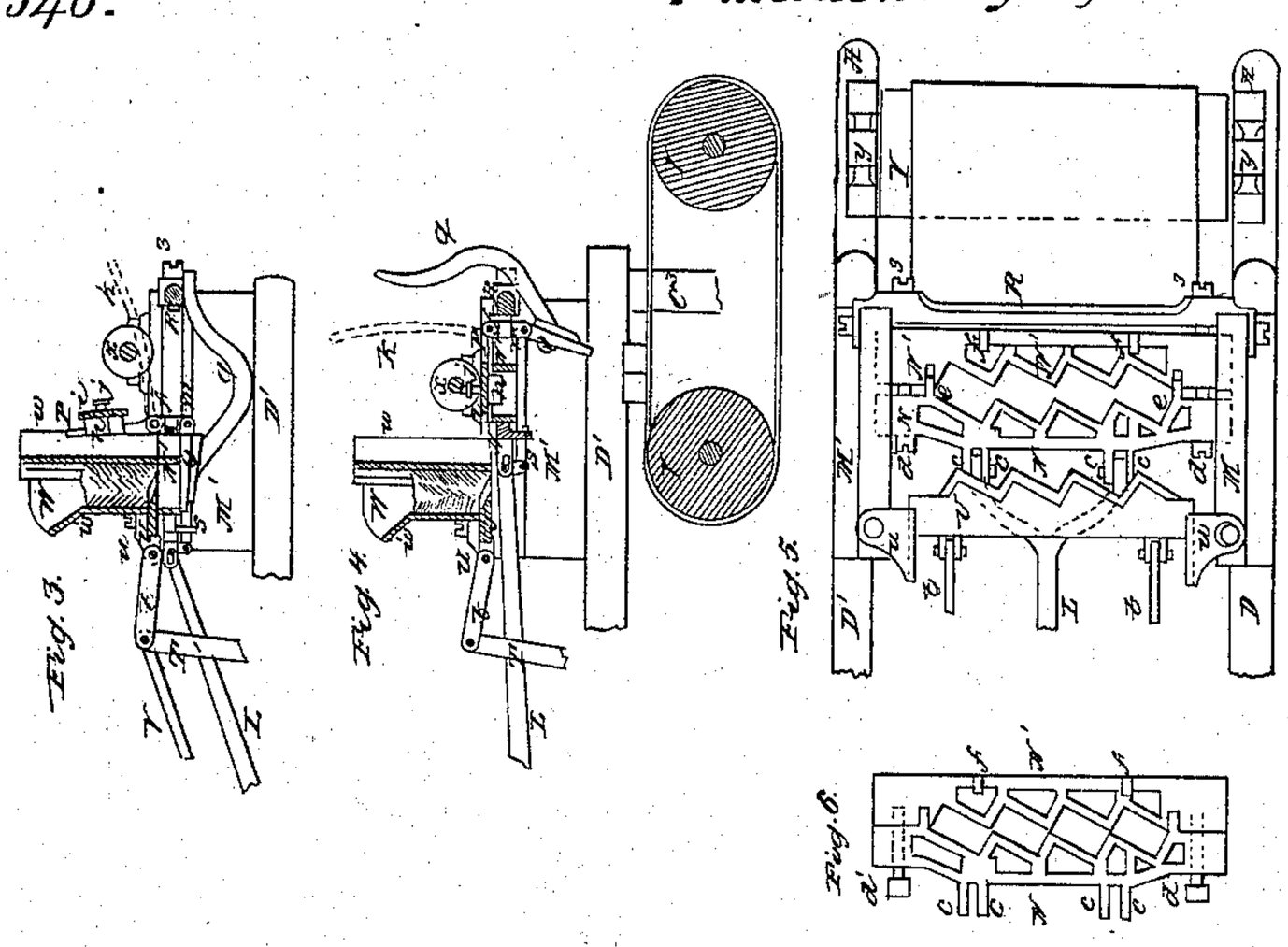
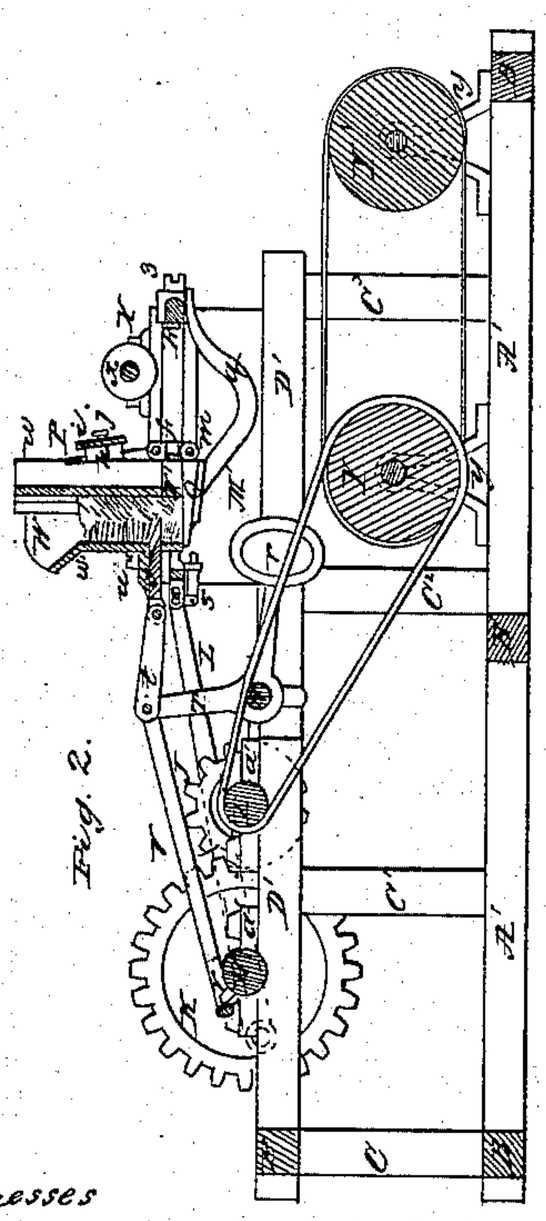
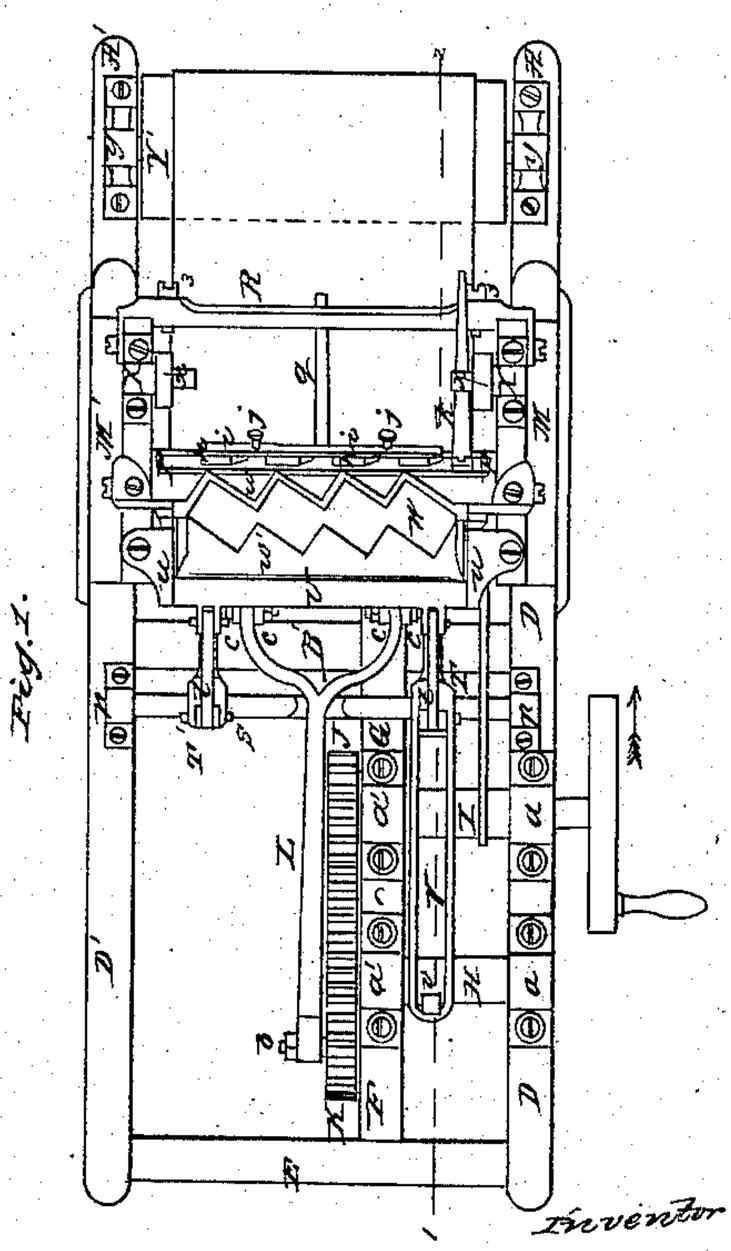
I. Harman,

Brick Machine.

No. 15,546. Patented Aug. 12, 1856.







Witnesses
Henry Howson
William Elbaltus

Inventor
Isaac Harman

UNITED STATES PATENT OFFICE.

ISAAC HARMON, OF TAMAQUA, PENNSYLVANIA, ASSIGNOR TO ISAAC HARMON AND WM. BICKEL, OF TAMAQUA, PENNSYLVANIA.

BRICK-MACHINE.

Specification of Letters Patent No. 15,546, dated August 12, 1856.

To all whom it may concern:

Be it known that I, ISAAC HARMON, of Tamaqua, Schuylkill county, State of Pennsylvania, have invented certain new and useful Improvements in Machinery for Making Bricks; and I do hereby declare 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.

My invention consists in the employment for making bricks, of sliding molds constructed in two halves, each half having any convenient number of angular recesses and projections.

A horizontal reciprocating motion is imparted by means of a crank motion to the molds which are arranged to slide in suitable guides. In addition to the reciprocating motion, the two halves of the guides are caused by means fully described hereafter, during certain points in the movements of the machine, to separate from and come in contact with each other, the points of the angular projections of the two molds always coinciding, so that the angular recesses of the halves together form oblong spaces of the form and size of the bricks to be manufactured. A knife is used in connection with the molds and so operated by means of rods and levers, fully described hereafter, that the moment the molds are supplied with tempered clay all communication between them and the reservoir above is cut off. To the underside of one half of the molds is hinged a radial plate so arranged in connection with levers and latches as to open and close during the movements of the machine, when closed forming the bottom of the molds, and when open allowing the bricks formed in the molds to escape therefrom; and to the upper side of one half of the molds is hinged a radial lid having a plate with projections corresponding in shape to the spaces formed by the angular recesses of the molds. This lid is alternately raised and lowered during the movements of the machine, raised when clay has to be admitted, and lowered so that in conjunction with the above mentioned radial plate the clay may be confined to the molds at the time the two halves of the latter are brought together. The whole is arranged and constructed for the purpose of manufacturing bricks of a superior quality, and that at a rapid rate.

In order to enable others skilled in the art to make and use my invention I will now proceed to describe its construction and operation.

On reference to the drawing which forms a part of this specification, Figure 1 is a ground plan showing my improvements in machinery for making bricks. Fig. 2, a sectional elevation on the line 1—2, Fig. 1. Figs. 3 and 4 elevations also in section of a portion of the machine with the moving parts in different positions. Figs. 5 and 6 sectional plans of portions of the machine in different positions.

The same letters of reference allude to similar parts throughout the several views.

The framework of the machine is composed of the lower longitudinal beams A and A′ connected together by the lower cross pieces B, B′, and B², of the upright pieces C, C′, C², C³ framed into the longitudinal beam A′, similar upright pieces framed into the longitudinal beam A, the upper longitudinal pieces D and D′ secured to the top of the uprights, upper cross piece E and intermediate piece F which is framed into E and which is supported at the opposite end on an upright piece resting on an intermediate piece G below, the latter being secured between the two lower cross pieces B and B′.

To the top the longitudinal beam D and that of the intermediate piece F are secured the boxes *a a* and *a′*, *a′*, which serve as bearings for the journals of the shafts H and I. On one end of the latter and outside the frame is secured a pulley or any other convenient driving apparatus, and on the opposite end is keyed a pinion J gearing into a cog wheel K on the end of the shaft H. To the face of the wheel K and a suitable distance from the center is attached a pin *b* embraced by the end of the connecting rod L the opposite forked end of which is jointed to lugs *c c* on the front half N of the sliding molds, the ends of the latter moving in guides M and M′ secured to the opposite longitudinal pieces D and D′ of the frame work (see Fig. 5). The holes in the lugs *c c* through which pass the pins for connecting the forked end of the rod L to the said lugs, are oblong so that the rod may have

a slight longitudinal play independent of the sliding molds N and N′ allowing the latter to have a temporary hesitation or dwell at each extreme end of its movement, the object of which will be apparent hereafter. The half N of the sliding mold is connected to the other half N′ at each end by means of the bolts *d* and *d′* which are so arranged that during the movements of the machine the projecting points of the two halves of the molds may at one time be in contact with and at another time removed from each other a limited distance as seen in Figs. 5 and 6. In order that these projecting points may always coincide laterally with each other, and thus allow the intervening spaces to form accurate recesses for receiving the clay, projections *e e* on one half of the molds slide into corresponding recesses in the other half.

On N′ are lugs *f f* to which is jointed the radial lid P. This has a series of openings corresponding in shape and position to the openings formed by the sliding mold when the two halves N and N′ of the latter are in contact with each other. Into these openings fit accurately but so as to move freely the projections *h* on the cover *i*, these projections also corresponding in shape and position to the openings formed by the two halves of the sliding mold. The distance of the outward movement of the projections *h* is regulated by the heads of the pins *j j* which are permanently secured to the radial lid P and which pass through holes in the cover *i*. To the latter is also secured a bent arm *k* (see Fig. 1 and in dotted lines Figs. 3 and 4). This will be referred to hereafter.

Underneath the half N′ of the sliding mold are lugs *m m* corresponding to the lugs *f f* above, and to these lugs *m m* is jointed a radial plate Q, having its upper surface flat and so arranged that at certain periods during the movement of the machine it shall entirely cover the openings in the sliding mold, as seen in Fig. 3, the points of two latches *s s* jointed to projections underneath the forked ends of the connecting rod L, serving to maintain the radial plate in the latter position as long as may be required. To the plate Q is secured a bent arm *q* so arranged as to come in contact at the required time with the cross-bar R which connects the opposite guides M and M′ together.

S is a shaft having its bearings in boxes *p*, *p*, secured to the opposite beams D and D′ of the framework, and to this shaft are secured the two bell crank levers T, T′, the horizontal arms of which are furnished with counterbalance weights *r r*, the vertical arms being jointed by means of the links *t t* to the cutter U (Fig. 5,) which slides in guides *u u* attached to the main guides M and M′, and which has angular projections formed to coincide with the angular recesses in the half N′ of the sliding molds. To the top of the vertical arm of the bell crank lever T and to the same pin which connects the latter to one of the links *t* is jointed the rod V, the opposite end of which rests on the top of the shaft H and is so acted upon by a projection *v* on the latter in conjunction with the weights *r*, *r*, as to draw the cutter U backward and forward at the required time. To the guides M and M′ is secured the reservoir W for receiving the clay to be formed into bricks. This reservoir is formed of two plates *w* and *w′* jointed together, and each plate has angular projections and recesses corresponding to those of the two halves N and N′ of the sliding molds, the projections and recesses of the front plate *w* coinciding with those of the front half N of the sliding molds, and the projections and recesses of the back plate *w′* coinciding with those of the back half N′ of the same, when the latter is brought forward to the position shown in Fig. 2, and when the two halves of the mold are separated to their utmost limit. The bottom edge of the plate *w* fits just so close to the top of the half N of the molds that the latter may move freely, but the bottom edge of the plate *w′* is so far distant from the top of the front half N of the sliding molds as to allow the knife V to pass easily. On the top of the guides M and M′ are brackets X having projecting pins on which run loose the rollers *x* which when the sliding molds are in the position shown in Fig. 4, bear one on each side of the plate P. Two drums Y and Y′ run loose on brackets *y*, *y*, secured to the beams A and A′, around these drums passes an endless band, and the whole is set in motion by a strap or cord passing around the shaft I and around one end of the drum.

The properly tempered clay being admitted to the reservoir W the machine is set in motion by turning the shaft I in the direction of the arrow, supposing the moving parts of the machine to be in the position shown in Figs. 1 and 2, that is with the connecting rod L nearly at its outward stroke and the two halves N and N′ of the sliding molds consequently drawn forward and separated from each other to their utmost limits so that their angular projections and recesses may coincide with those in the reservoir at the same time the radial plate Q has through the contact of its arm *q* with the cross bar R closed the underside of the sliding molds, and the lid P with the plate *i* and its projections *h* has been raised by the arm *k* coming in contact with the pin projecting from the bracket X, at the same time the projection *v* on the shaft H has caught the end of the rod V and has with-

drawn the knife U from the reservoir. The tempered clay now passes from the reservoir into the space between the two halves N and N′ of the sliding molds. On the further movement of the shaft H in the direction of the arrow, the rod V becomes released from the projection and the counter balance weights *r r* will act on the levers T T′ and links *t t* so as to project the knife U forward until its angular projections coincide with the angular recesses in the half N′ of the sliding molds, thus effectually separating the clay in the reservoir W from that in the said sliding molds.

At the time the releasing of U and consequent movement of the knife takes place the connecting rod L has arrived at its utmost outward stroke and on the further movement of the machine commences its reverse stroke, it does not immediately commence to move the sliding mold however on account of the oblong holes in the lugs *c c* already alluded to. When the pins which serve to connect the forked ends of the rod L to these lugs have arrived at the end of the oblong holes the point of the latches S, S have caught underneath the radial plate Q rendering the latter a permanent base for the clay in the sliding molds to rest upon. (See Fig. 3.) These sliding molds with the clay contained therein are now carried forward until the ends of the elevated radial lid P come in contact with the rollers *x*, *x*, at the same time the bent lever *k* being released from the pin on which one of these rollers is hung the radial lid P now falls down, and the projections *h h* on the plate *i* rest on the clay contained in the molds, the projections coinciding on one side with the angular projections and recesses in the half N′ of the sliding molds. The whole sliding mold is then carried forward still farther until the half M′ strikes the points of the set screws 3, 3, in the bar R when the further progress of this half of the mold is retarded. The connecting rod however has not yet reached its utmost stroke and does not do so until the half N of the mold has been pushed so close up to the other half, that the angular projections of one touch and coincide with the angular projections of the other and the recesses of both combined form a series of oblong spaces or recesses of the same size as the bricks to be manufactured. (See Fig. 6.)

It will be observed that as the clay which was first admitted to the molds when the latter were separated or expanded, is, in the present position of the machine, confined above by the radial lid P plate I, and projections *h*, and below by the locked plate Q so that the moving together or contracting of the two halves of the molds must necessarily condense the clay and cause it to assume compact masses of the desired form. The connecting rod has now reached its extreme movement, and the bricks have been formed in the molds. It now remains to release them from the same and drop them on the endless band below. As the machine continues its movements the connecting rod reverses, in the first instance the latches *s*, *s*, are removed from under the plate Q, which drops down and assumes the position shown in Fig. 4. As soon as the pins which connect the forked end of the rod to the lugs *c c* arrive at the end of the oblong openings in the latter then the half N of the molds is again removed a limited distance from the other half N′, releasing the bricks which being now acted upon by the weight of the projections *h* on the loose plate *i* fall on the endless band and are carried to the distance required. (See Fig. 4.) As the sliding molds now move back toward the position shown in Figs. 1 and 2, the ends of the radial lid P become released from contact with the rollers *x x*, and at the same time the bent arm *k* striking the pin on which one of these rollers is hung elevates the radial lid, with its loose plate *i* and projections *h* to the position shown in Fig. 2. During the same movement the bent arm *q* has come in contact with the bar R and again closed the plate Q preparatory to being afterward caught by the latches *s*, *s*. The projection *v* on the shaft H catches the end of the bent rod V and withdraws the end of the knife U, and thus the moving parts of the machine assume the position shown in Figs. 1 and 2 when a repetition of the above described movements takes place.

It will be understood that the principal feature in this machine is the arrangement of the molds which expands when the clay is first admitted and afterward contract so as to condense the clay confined in the molds above and below into a compact mass making pressed bricks of a superior quality, and at a rate of speed hitherto unknown.

What I claim and desire to secure by Letters Patent is—

The molds, composed of two halves N and N′ having any convenient number of angular projections and recesses, the points of the angular projections of one half coinciding with those of the other half the said molds being caused to expand and contract, and being constructed and operated substantially in the manner and for the purpose herein set forth.

ISAAC HARMON.

Witnesses:

HENRY HOWSON,

WILLIAM E. WALTON.