J. N. SMITH.

BRICK PRESS.

No. 103,381. Patented May 24, 1870.

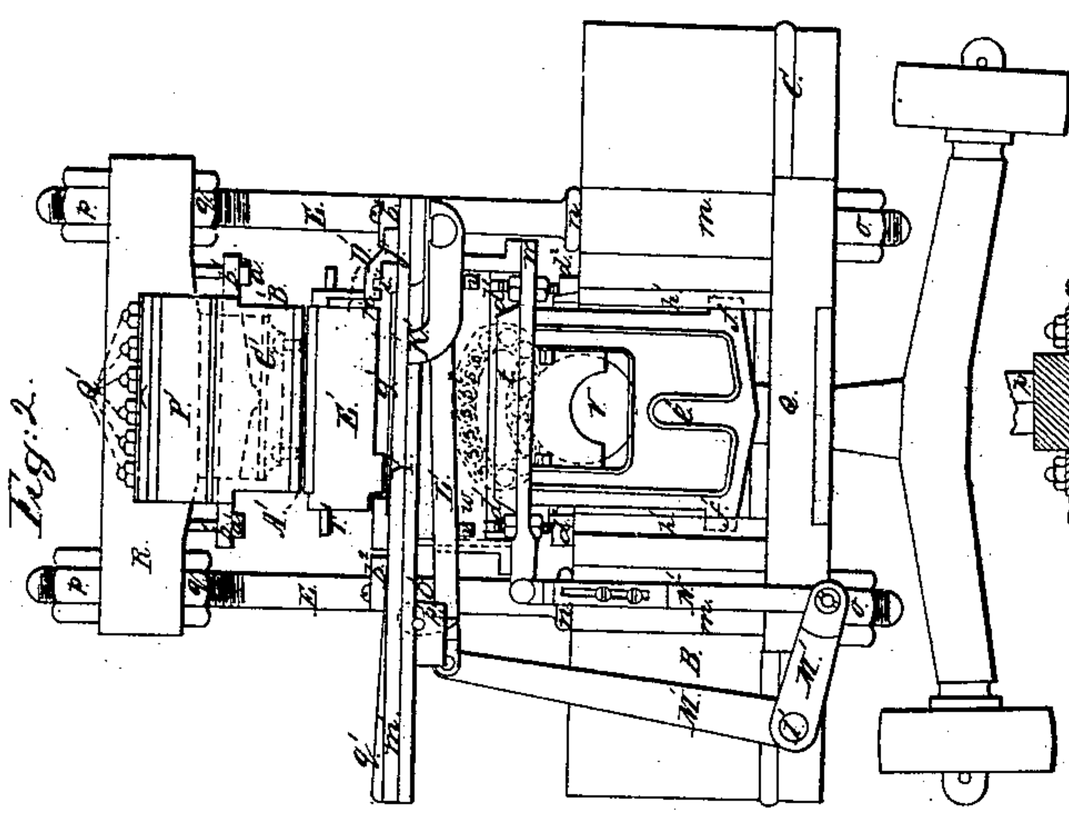

Fig: 2.

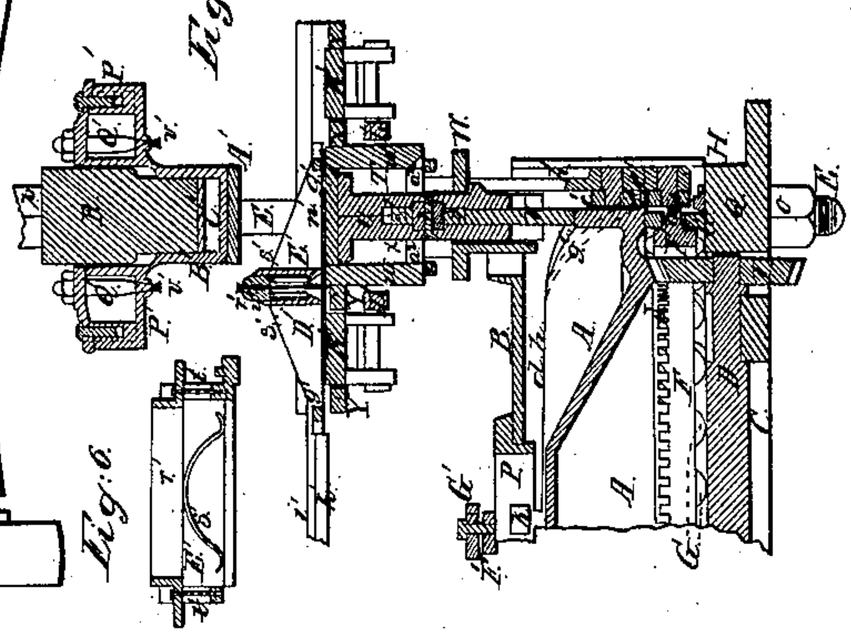

Fig: 4.

Fig: 6.

Fig: 1.

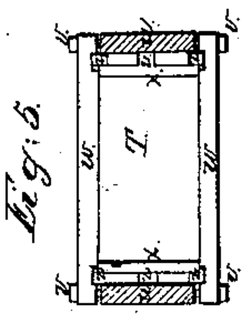

Fig: 5.

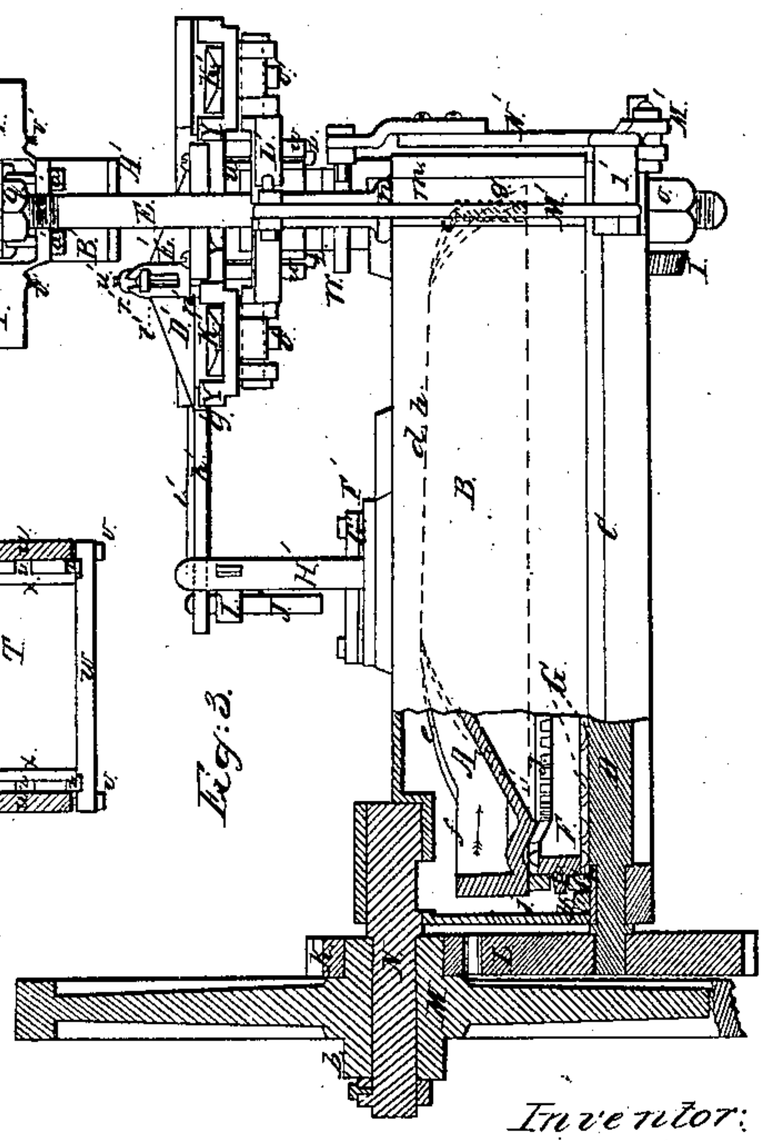

Fig: 3.

Witnesses:

P. H. Weston

Ada Weston

Inventor:

J. Nottingham Smith

By H. James Weston,

atty.

United States Patent Office.

J. NOTTINGHAM SMITH, OF JERSEY CITY, NEW JERSEY.

Letters Patent No. 103,381, *dated May* 24, 1870.

IMPROVED BRICK-PRESS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, J. NOTTINGHAM SMITH, of Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in a Brick-Press; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings and to the figures and letters of reference marked thereon.

My invention relates exclusively to machines for re-pressing bricks after they have been molded and partially dried or seasoned, so that the water contained in them has become in some degree separated from the clay, occupying small cells or interstices between the particles or shrunken portions of the clay, from which it may in a considerable degree be pressed out. My machine is designed to produce bricks somewhat similar to those known as the "Philadelphia pressed or front brick," though they are much more uniform in density than the latter, and are of more even thickness.

The object of my invention is to perfect and improve a certain brick-machine for which Letters Patent of the United States were granted to me on or about the 12th day of March, 1867. The main mechanical features of the said patented invention—consisting of the annular wedge, driven by a pinion on a horizontal shaft which meshes into teeth on the under side of the said annular wedge; the lower die-plate, supported on a post or plunger which bears upon the inclined upper surface of the said annular wedge; the mold or surrounding die, which is raised and lowered in conjunction with the said lower die by projecting shoulders or flanges on the outer surface of the main part of the annular wedge, which shoulders or flanges constitute, with the under surface of the main wedge, a second wedge or circuit of wedges; a stationary upper die, and a suitable frame—are all retained. The carrier which carries the said mold or surrounding die is also extended laterally at the top, to form a table on which the bricks are fed to and received from the machine.

My present invention consists—

First, in the combination with the said series of rollers, on which the said annular wedge rests, of a hoop placed concentrically with the track on which they are to travel, and furnished with projecting pins or spindles, on which said rollers are hung, whereby the said rollers are kept in place.

Second, in supporting the plunger or die-post which carries the lower die of the said press upon a compound friction-roller bearing, consisting of a series of rollers traveling an endless circuit in a channel formed in the body of the said die-post, against which rollers the wheel or roller in the foot of the said die-post bears.

Third, in the combination with the said dies of a carriage or stripper for delivering the bricks to and removing them from the said dies, the said stripper being operated by the annular wedge by or through suitable devices connecting the said stripper to a roller or pin attached to and projecting from the annular wedge.

Fourth, in the combination with the said stripper and dies of auxiliary carriers, which are operated through suitable devices by a bell-crank or bent lever, which is put in motion by the rise and fall of the surrounding die, the said auxiliary carriers serving to remove the pressed brick from the stripper, and also to insure the accurate delivery of the unpressed brick thereto.

Fifth, in the combination with the said dies of an oiler or frame containing one or more oiling-wicks, and attached to the said stripper, the said oiler being carried between the upper and lower dies, with its wick or wicks in contact with the said dies at each lateral movement of the stripper.

Sixth, in the combination with the said oiler, stripper, and dies of oil-tanks or reservoirs attached to the frame of the machine, in such a position that the wicks of the said oiler shall be put in contact with the supply wicks inserted through the bottoms of said tanks, at each upward motion of the lower die and surrounding die, whereby the wicks in the oiler are kept fully supplied with oil.

Seventh, in the combination with the said tanks of a series of independent feed openings, through which the oil is fed to the wicks, the said openings being closed with adjustable stoppers, whereby the amount of oil fed to any part of the said wicks is fully under control.

Eighth, in combination with the upper die and girt R of the spring bearing C', which yields only when undue pressure is brought to bear upon it, thus saving the machine from breakage.

Ninth, in the combination with the surrounding die, the lower die and its die-post, and the frame or guide on which the surrounding die rests, of bolts which, by means of adjusting nuts thereon, determine the height to which the surrounding die shall rise, thereby regulating the size of the opening through which the surplus material escapes.

In the accompanying drawings—

Figure 1 is a plan of a brick-press which embodies my invention.

Figure 2 is a front elevation of the same.

Figure 3 is a side elevation of the same, the left-hand portion being shown in section on a vertical plane passing through the center.

Figure 4 is a vertical central section of the right-hand portion of the said machine, taken on the line *y y*, fig. 1.

Figure 5 is a top view, in detail, of the mold or surrounding die which is used in the said machine.

Figure 6 is a central longitudinal section of the oiler and frame used in the said machine.

The annular wedge A is inclosed in a light hoop or box, B.

In the bottom C of the hoop B the bearings for the shaft D are formed. This bottom piece C is annular in form, flat on its upper surface, and is secured to the hoop B by the bolts E E at one side, and by small bolts passing through suitable lugs formed on the said hoop and bottom, at the other side.

Upon the flat upper surface of this bottom ring is placed a series of rollers, G, which are kept in place by a ring, F.

From the ring F pins or spindles *a* project, passing loosely through holes in the rollers, keeping them at the proper distance apart, and preventing their running too much toward the center.

The rollers are kept from running off from the said pins by a flange or ring, H, which encircles the track on which the said rollers are to run, and is secured in place by any suitable means, as by being fitted snugly against the inner surface of the hoop B.

Upon the series of rollers G the annular wedge A rests and revolves, motion being imparted to it by the driving-shaft D, on which is a beveled pinion, I, which meshes into corresponding teeth J on the under surface of the annular wedge A. The weight of the annular wedge A and its downward pressure, occasioned by the resistance of the brick to compression, are all borne by the series of rollers G, and thus the friction is much reduced.

The driving-shaft is driven by the pinion K, which meshes into the wheel L on the said shaft.

The pinion K is keyed to the hub of a fly-wheel, M, which turns on a spindle, N. The spindle is fastened to the hoop B.

Any suitable device for imparting motion to the fly-wheel M and pinion K may be attached to the hub of the fly-wheel at *b*.

A pawl, O, secured to the hoop B, takes into the teeth K, and prevents the shaft of the machine D from being turned backward.

The annular wedge A has the necessary abrupt lifting inclines *c c*, gradual upward inclines *d d*, abruptly descending inclines *e e*, and level portions *f f*, for operating the lower die; and the abrupt lifting inclines *g g*, gradual upward inclines *h h*, abruptly descending inclines *i i*, and dead spaces *j j*, for operating the mold or surrounding die, twice at each revolution of the said wedge A. The relative positions and lengths of these various portions in the length of the wedge is clearly indicated in dotted lines in fig. 1, and is also shown in figs. 3 and 4.

It will be observed that the gradual upward inclines *h* and *d* lie in the same plane, and form one continuous inclined surface.

The hoop B has a circular central opening in its top, in which is fitted a true circular facing, P, against which the centering rollers *k* and dog *l*, secured to the top of the wedge A, bear, and thus keep the wedge A properly centered while it revolves.

The bolts E pass through the bottom ring C at the front of the machine, the said ring C being enlarged at that point to form the resisting or supporting sill Q, which receives and sustains the downward thrust occasioned by the pressing of the bricks. The bolts E also pass through a recess or enlarged portion, *m*, of the hoop B, holding the ring C and hoop B together between the flanges or beads *n* and nuts *o*, and at the top pass through and sustain the upper resisting girt R, by means of the nuts *p p* and *q q*. Between these bolts E, and guided by bearings b^2, which partly embrace and slide up and down on the said bolts, are the lower die S and the surrounding die or mold T. The lower die is secured to the top of the die-post U, which is made in two parts and bolted together. In the inner faces of these two parts a channel, *r*, is formed for a series of rollers, *s*, which travel an endless circuit therein.

Bearing against these rollers, and supporting the weight and pressure of the said lower die, is a large roller, V, which stands or rolls upon the surface *c d e f* of the wedge A.

A curved bearing, *t*, is let into the sides of the post U, to furnish a bearing or track for the rollers *s* and receive and resist their pressure.

By this arrangement of parts it will be seen that the friction is very much reduced. The die-post U is held in an upright position and prevented from turning by the rectangular form of the die S fitting in the surrounding die T, and by the guide-piece W, which is itself guided by the table Y, in which the surrounding die T is set, or to which it is attached.

The table Y is guided by the guide-pieces b^2, which slide up and down on the bolts E.

The surrounding die T is attached to the under side of the table Y, by means of the end pieces *u*, which are cast in one piece with the said table, and extend downward at right angles with the under side thereof.

To these end pieces *u*, strong, thick side pieces, *w*, are secured by bolts *v*. The inner faces of these sides *w* are planed or ground to a true plane, and serve as the side faces of the surrounding die.

The end faces are formed of two thinner plates, *x*, which have their inner faces planed or ground to a true plane, and their ends finished parallel and perpendicular to their faces. The length of these end plates is equal to the width of a brick, and, being placed between the side pieces *w*, as seen in fig. 5, and the bolts *v*, tightened, they hold the side pieces at the proper distance apart, and are themselves partly held in place by the said side pieces.

Wedges *z* are driven in between the end pieces *u* and the plates *x* to hold them in place, and prevent their spreading apart.

It is plain that the die-faces thus formed may be taken apart, and their inner surfaces or faces only ground, when worn, and then be restored to their original and proper form and position with very little trouble and expense, and without enlarging the die.

The inner lower corners of the face-plates *w* and *x* are cut away, at an angle as seen at a^2, in fig. 4, whereby a narrow opening is left between the lower die and the surrounding die, through which any surplus of water or other material contained in the brick may escape while the brick is being pressed, and the bricks may thus be brought to a uniform thickness. As the surrounding die passes downward, after the brick is pressed, it cuts off any feather or projection left on the brick by reason of this opening, and thus leaves the corners of the brick sharp and true.

The table Y, with the die T and the other devices attached to it, is raised and lowered by the wedge formed by the flanges *h*, *g*, and *i*, operating on the rollers *c'*, which are attached to the descending portion *e'* of the guide W.

The portion *e'* of the guide W has wings *f'* upon it, which slide in grooves *h'* in the casing B, to guide the guide W.

The rollers *c'* raise and lower the guide W, and with it the table Y, through or by means of the bolts d^1, which are fastened in the end pieces *n*, and are also secured to the guide W by nuts.

These nuts on the bolts d^1 furnish a means for regulating the height to which the die T shall rise, thus controlling the size of the opening at a^2, while the lower ends of the bolts d^1, striking the blocks d^2, stop the die T in its descent, so that, when at their lowest points, the upper surfaces of the dies S and T are

always at the same height, and the bricks may be stripped off without injury.

The upper die A′ is fastened to a box B′, which is secured to the upper girt R by bolts a^1, passing loosely through wings or lugs b' on said box, and entering the girt R.

A spring, C′, is interposed between the said box and the girt R, which allows the said box and the die A′ to yield when under pressure, is applied thereto, and thus prevent the breaking of the machine.

D′ is the stripper or carriage which delivers the unpressed brick to the dies, and removes the brick which has been pressed.

It slides across the top of the table every time the dies descend to their lowest point, and, by means of its arms g' g', and the central part E′, which acts as a third arm, carries the bricks with it.

It is guided by a flange or rib, i', which works in a slot in a guide piece, j', bolted to the table Y.

The said carriage or stripper is operated or moved by a dog, l, on the upper surface of the wedge A, which projects upward through the facing P, sufficiently high to come in contact with and move the swing pieces F′, as the said wedge A revolves.

The pieces F′ are linked together by the connecting-bar G′, and thus always move together.

From one of these pieces F′ a post or stud, H′, projects upward, and carries a spring-arm, I′, which clasps a pin, J′, inserted in the under side of a projecting portion, k', of the carriage or stripper D′. The stripper is thus moved once to the right and once to the left at each revolution of the wedge A, and, consequently, removes and feeds in the bricks as fast as they can be operated upon by the dies.

The unpressed bricks are fed to the stripper D′ by hand, and the pressed bricks are removed from the stripper by the auxiliary carriers K′.

These carriers are operated by the rise and fall of the table, through or by means of the yoke L′, and a bent lever or bell-crank, M′, pivoted at l', and actuated by the rod N′, which is secured to the guide W, and thus rises and falls with it.

It will be seen that, by the upward motion of the dies, the carriers K′ are moved so as to carry the pressed brick, which has been delivered to one of them by the stripper D′, out to the end m' of the table, and, by the downward motion of the dies, the said carriers are moved back, carrying with them, and pressing snugly up against the flange n' of the stripper, the unpressed brick, which has been left by the attendant within the arms of the stripper.

As the carriers K′ move out, they strike a cam, o', which is hung loosely on a pin, p', in the table Y, its upper surface projecting slightly above the table.

This cam o' is so formed that it will revolve sufficiently to quickly lift the carrier, as it advances, a little higher than the inclined ways q', when the projection on the cam strikes the under side of the table, and prevents the further turning of the cam, while the carrier continues on to the end of its motion. On the return of the carrier, the cam runs back and quickly lowers it, thus leaving the brick on the ways q'.

The middle arm E′ of the stripper D′ is formed into a box or frame, open at the top and bottom, in which a clamp or wick-holder, r', is placed, and supported on springs s'.

The height of this wick-holder may be adjusted within certain limits, by means of the bolts t', which pass through its ends, and are screwed into the frame E′.

A flat wick, u', is fitted into the wick-holder, its upper and lower edges projecting sufficiently to sweep across the faces of the dies S and A′, as the stripper D′ passes between the said dies.

The upper corners of the wick-holder r' are rounded off, in order that it may yield downward, and pass the die A′ without breaking, if it should come in contact with the corner of the said die.

Oil, for lubricating the said dies, is supplied to the wick u' from boxes or tanks P′, which are cast with or secured to the box B′.

In the bottoms of each of the tanks P′ a line of holes is made, and wicks v' placed therein.

The amount of oil which is fed out to the wick v' is regulated by adjustable plugs Q′, which pass through the covers of the tanks, and are raised and lowered by nuts on their upper ends, bearing against the tops of the said covers. These holes are so placed that the wick u' comes in contact with one line of the wicks v' each time it rises, and thus receives a supply of oil. As each of the plugs Q′ is independent of all the others, the amount of oil fed to any part of the dies may be regulated by raising or lowering the proper plugs.

The operation of the machine is as follows:

The machine being in motion, and the table Y descending, a brick is placed by the attendant near the flange n', and between the middle arm E′ of the stripper and the arm g', which is farthest from the dies. As the table Y approaches its lowest point, one of the carriers K′ carries the brick snugly against the flange n', thus bringing it exactly in line with the dies. The stripper then moves across the table, carrying the brick with it, and depositing it exactly over the lower die S. The dies S and T are now raised, the former by the incline c, on the annular wedge A, and the latter by the incline g, and the brick brought up to the die A′. At this point the upper corner of the die S is a little below the upper corner of the bevel a^2, leaving a slight opening. The inclines d and h next raise the dies S and T together, and at the same speed, pressing the brick against the die A′, the surplus material escaping at a^2, and the spring C′ yielding, if the pressure is too great. At the same time the wick u' comes in contact with the wick v', and receives a supply of oil. The brick having thus been pressed, the inclines e and i cause the dies S and T to descend to their lowest positions. The dog l now comes in contact with the swing piece F′, and moves the stripper D′ to the other side of the table, carrying the pressed brick with it, and depositing it upon one of the carriers K′, while at the same time an unpressed brick, which has been placed in the other side of the stripper D′, is brought to the dies. As the stripper moves across the table, the wick u' oils the faces of the dies S and T. The table Y and dies S and T again rising, the pressed brick is carried by the carrier K′, and deposited on the ways q', from which it is removed by an attendant.

The operation, as thus described, is repeated in the pressing of each brick, the machine being designed to press one brick each time the table rises, or two bricks by each revolution of the annular wedge A.

Having thus fully described my invention,

I claim—

1. The ring F, having pins or spindles a attached to and projecting from it, the rollers G, and wedge A, combined and arranged substantially as set forth.

2. The combination, with the die-post U and annular wedge A, of the roller V and rollers s, forming a compound friction-roller bearing, substantially as specified.

3. The stripper D′, constructed and operated as described, in combination with the dies and the annular wedge A, substantially as set forth.

4. The combination, with the dies and the said stripper D′, of the auxiliary carriers K′, constructed and operated substantially as specified.

5. The oiler E′, combined with the stripper D′ and dies, substantially as hereinabove specified.

6. The tanks P′, combined with the oiler E′, strip-

per D′, and dies, substantially as hereinabove set forth.

7. The independent feed-openings, combined with the tanks P′, plugs Q′, and wicks *v′*, substantially as hereinabove specified.

8. The spring C′, combined with the die A′ and girt R, in such a manner that the said spring receives and sustains the whole pressure applied to the die A′, yielding only to prevent the breaking of the machine, substantially as set forth.

9. The combination, with the die T, die-post U, and guide W, of the bolts *d′*, and the adjusting-nuts thereon, whereby the size of the opening a^2 is increased or diminished, substantially as hereinabove set forth.

J. NOTTINGHAM SMITH.

Witnesses:
HENRY B. GEER,
H. JAMES WESTON.