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Patented July 11, 1899.

A. L. CONVERSE & J. T. UNDERWOOD.
BRICK SANDING AND FORMING MACHINE.

(Application filed Nov. 25, 1895.)

(No Model.)

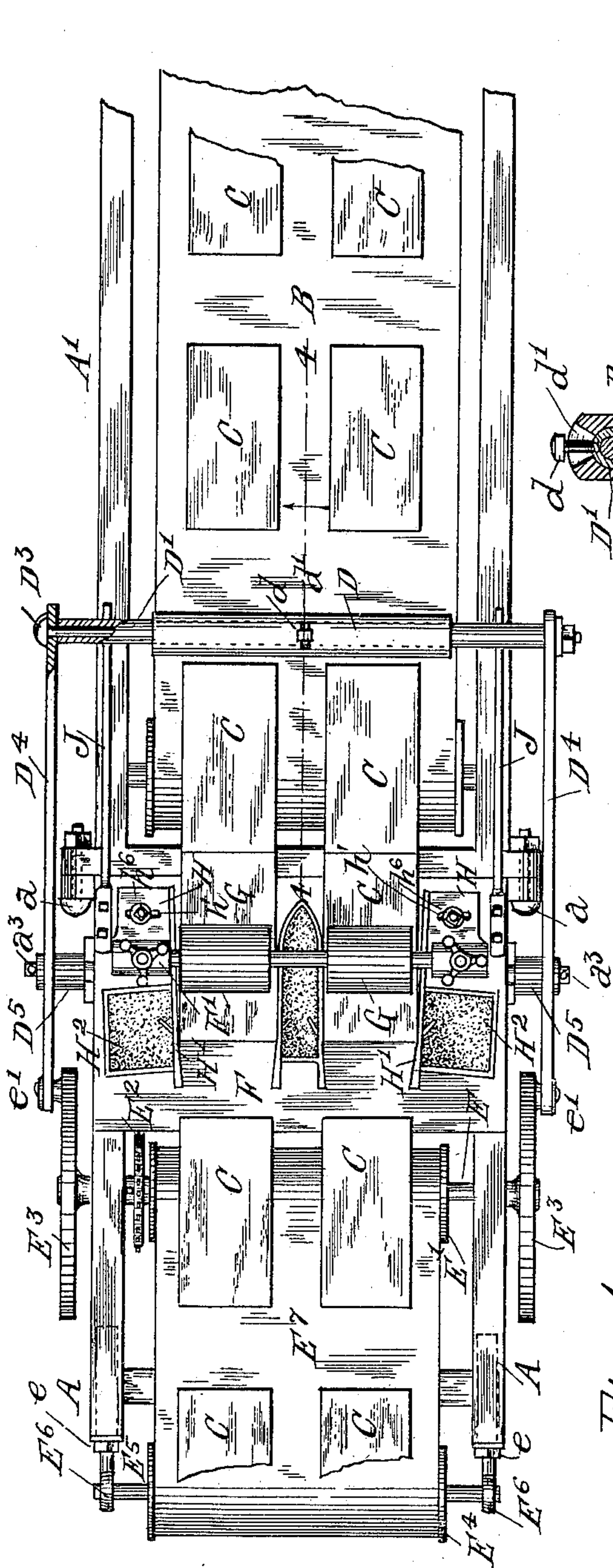


Fig. 1.

Fig. 4.

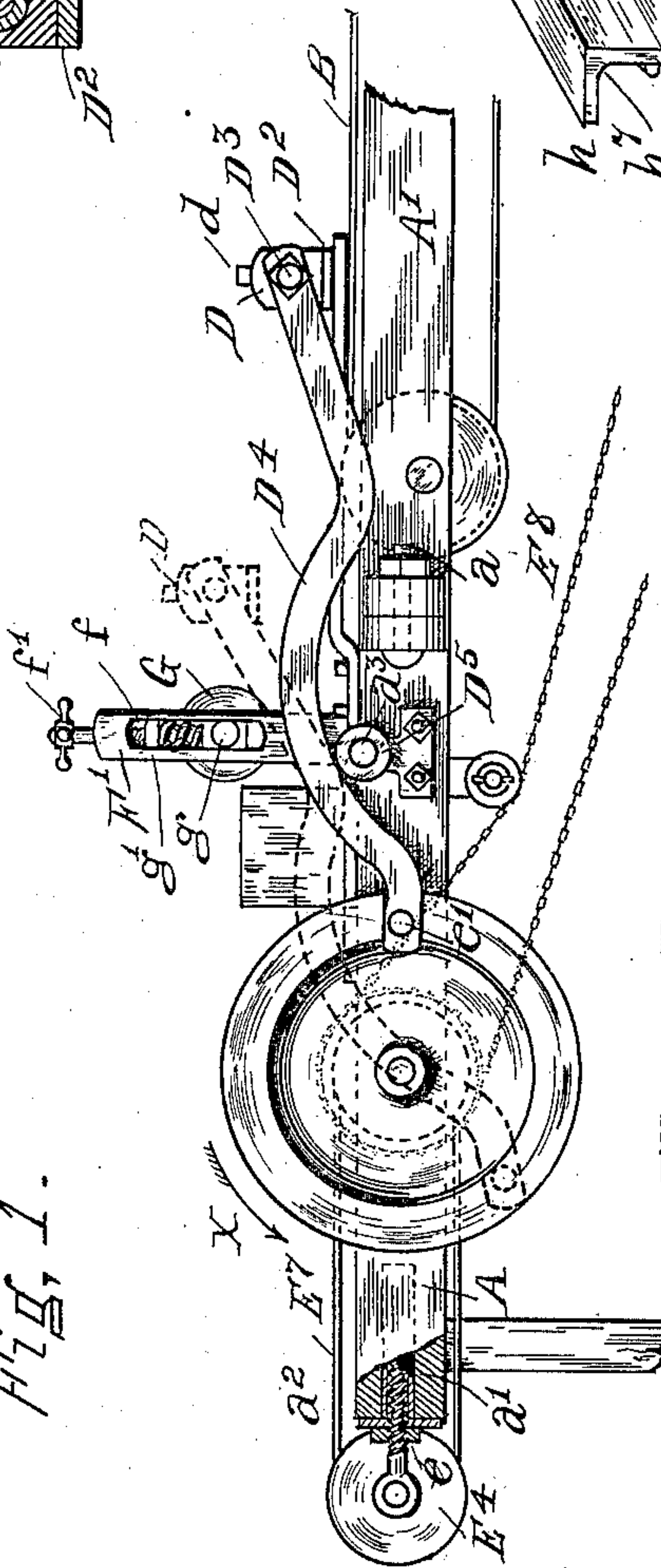


Fig. 2.

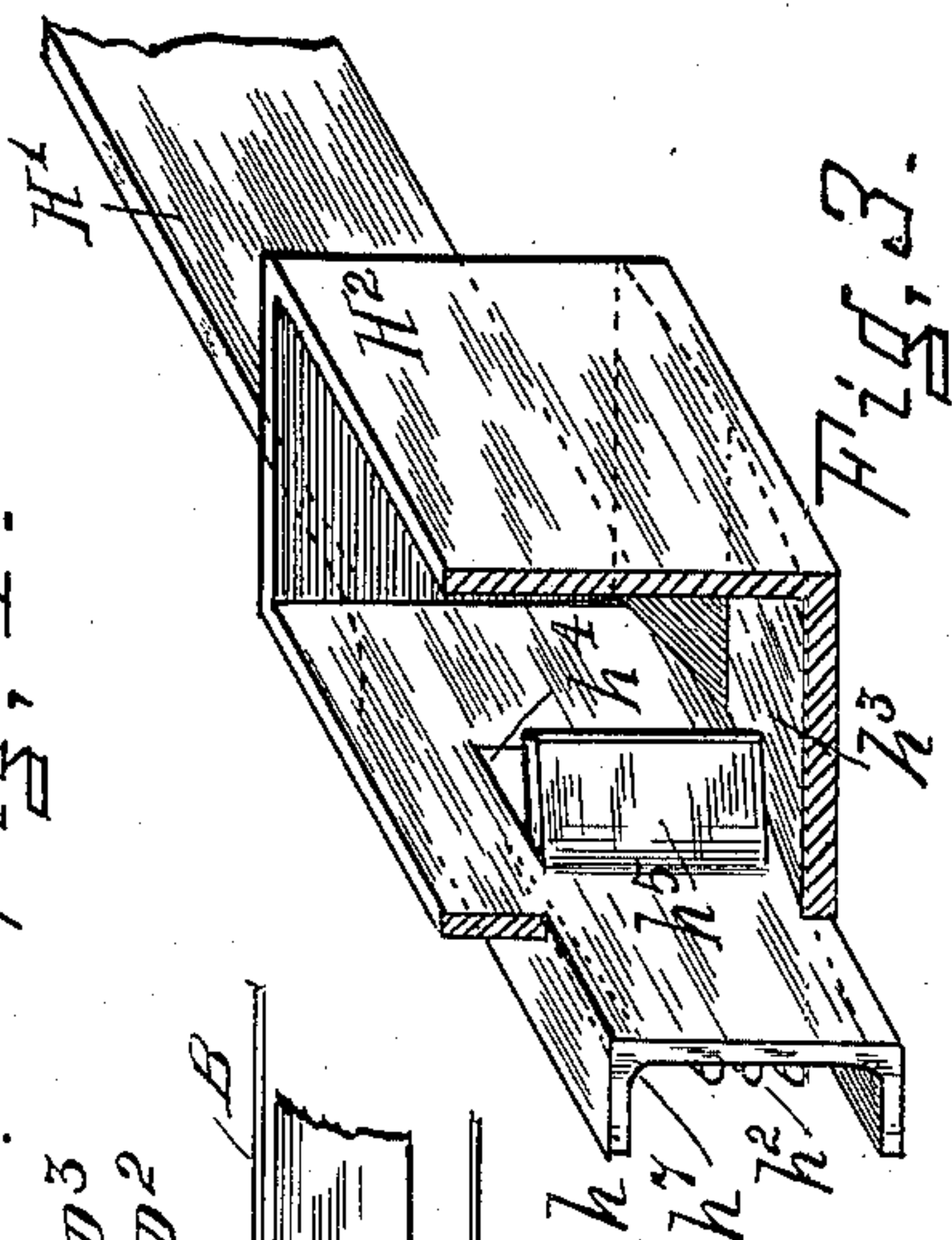


Fig. 3.

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UNITED STATES PATENT OFFICE.

ALBERT L. CONVERSE AND JOHN T. UNDERWOOD, OF SPRINGFIELD,
ILLINOIS.

BRICK SANDING AND FORMING MACHINE.

SPECIFICATION forming part of Letters Patent No. 628,903, dated July 11, 1899.

Application filed November 25, 1895. Serial No. 570,042. (No model.)

To all whom it may concern:

Be it known that we, ALBERT L. CONVERSE and JOHN T. UNDERWOOD, citizens of the United States, residing at Springfield, in the county of Sangamon and State of Illinois, have invented a certain new and useful Brick Sanding and Forming Machine, of which the following is such a full, clear, and exact description as will enable those skilled in the art to which it appertains to make and use our said invention.

The general purpose of our invention is to provide a machine adapted to apply dry sand to the surface of newly-made or unburned bricks, also adapted to impart desirable forms or configurations to the edges or surfaces of said bricks before they are dried and stacked in the kiln for burning in order to prevent the fusing and sticking together of the bricks during the process of burning.

Hitherto the common practice in the manufacture of brick has been to take the brick from the molding-machines and after sufficient preparatory seasoning or drying stack them on their edges in kilns for burning, sand being sprinkled by hand on the upper edges of each layer of bricks as it is placed in the kiln. This method of applying the sand is wasteful of sand and is also objectionable because the sand cannot be evenly distributed by hand on the surface of the bricks and also because the greater part of the sand, instead of falling on the edges of the bricks, where alone it can be serviceable, falls down into the kiln and obstructs the kiln to such an extent as to necessitate the frequent cleaning out of the kiln.

With the foregoing general purpose in view the special purposes of our invention are to provide means adapted to apply sand to two opposite surfaces only of bricks in such manner that when the bricks are stacked in the kiln for burning there will be sand on those surfaces of the bricks which are in contact with each other, but not on the other surfaces of the bricks; to provide sand-boxes of novel and improved form adapted to supply constant streams of sand falling by gravity into contact with the surfaces of bricks passing through the machine; to provide means whereby said sand-boxes may be adjusted laterally

relative to bricks passing through the machine; to provide resilient connections between the sand-boxes and the main frame of the machine adapted to yield under undue pressure and react when said pressure is removed; to provide means whereby the edges of the bricks may be rounded, chamfered, or otherwise molded or shaped and whereby also other useful or ornamental forms or configurations may be impressed or molded on the surfaces of the bricks as they pass through the machine; to provide vertically-adjustable rollers adapted to prevent displacement of bricks passing through the machine; to provide a push-bar adapted to push separate bricks while in a moist and plastic condition forward between the sand-boxes; to provide means adapted to actuate said push-bar in such a manner that as it moves forward it will engage with the ends of bricks supplied to the machine and push them forward between the sand-boxes and as it moves backward will rise sufficiently to pass over the bricks coming next in succession into the machine and will then fall into position to engage with the ends of said last-mentioned bricks and push them forward between the sand-boxes, and so on continually; to provide means adapting said push-bar to gravitate so that its front face will maintain a perpendicular position parallel to the ends of bricks passing through the machine in order that the push-bar may engage with the bricks uniformly along the flat surface of the ends of the bricks, thereby avoiding injury to the bricks; to provide means for conveying the bricks into position to be engaged by the push-bar, and to provide means for conveying the sanded bricks into position to be conveniently removed from the machine.

With these ends in view our invention consists in certain novel features of construction and combinations of mechanism shown in the annexed drawings and hereinafter particularly described and specifically claimed.

In the drawings, to which reference is barely made, Figure 1 is a top plan of the complete mechanism. Fig. 2 is a side elevation of same. Fig. 3 is an enlarged perspective view of one of the sand-boxes and a part of the resilient plate with which it is con-

needed, one end of the sand-box being shown as broken away, so as to show the inwardly-projecting wing on the sand-box. Fig. 4 is an enlarged vertical section through the push-bar on the line 4 of Fig. 1.

Similar letters of reference designate like parts in all of the views.

In the drawings the sanding device is illustrated as connected with the forward end of the conveyer-frame of a repressing-machine, the conveyer of the repressing-machine serving to convey the bricks into position to be engaged by the push-bar; but it is obvious that our machine may be provided with suitable means for conveying the bricks into position to be engaged by the push-bar or that the bricks may be placed by hand in proper position and that our sanding device may be used in connection with or entirely detached from a brick-machine or a repressing-machine without departing from the spirit or sacrificing any of the essential features of our invention. It is obvious also that our machine is adapted to sand and form either the sides, edges, or ends of bricks and is adapted to operate on either molded, side-cut, or end-cut bricks.

The main frame A of the sanding-machine is preferably detachably connected with the conveyer-frame A' of a brick-machine or repressing-machine by bolts a.

A suitably-actuated conveyer B conveys the bricks C into position to be acted upon by the push-bar D.

A roller E', a sprocket-wheel E², and crank-wheels E³ are secured to and turn with the shaft E, which turns in suitable bearings in the main frame and is driven in the direction indicated by the arrow X by a chain E⁸, actuated by any suitable motive power, preferably by a sprocket-wheel on a revolving shaft of a brick-machine or a repressing-machine. A roller E⁴ is secured to the shaft E⁵, and the shaft turns in the eyes of eyebolts E⁶. In the ends of the side rails of the main frame A holes a' are bored, and short pipes a² fit in said holes. The eyebolts E⁶, which are threaded and provided with nuts e, fit loosely in the pipes a². An endless conveyer-belt E⁷ runs on the rollers E' and E⁴.

The tension of the conveyer-belt E⁷ is regulated by turning the nuts e so as to force the eyebolt, outward or permit them to move inward, as may be necessary for the proper adjustment of the conveyer-belt.

In order that the bricks may be properly sanded, they must be in such a moist and plastic condition that the sand will adhere to them. While the bricks are in that condition they will not stand excessive pressure, and we have found in practice that it is impracticable to push more than two bricks at a time forward through each sanding device without injury to the bricks. It will be seen, therefore, that there is great practical advantage in employing in connection with the sanding devices a reciprocating pushing device adapt-

ed to push the bricks successively forward in sets of twos. There is also great practical advantage in employing a reciprocating pushing device adapted to cooperate with an intermittently-acting repressing-machine, so as to present the bricks to the sanding device as fast as they come from the repressing-machine. We will now describe the means which we preferably employ to accomplish these results.

A gas-pipe D' passes transversely through the push-bar D, which is preferably of wood, and the bar turns freely on the pipe within an arc limited by the bolt d passing through the transverse slot d' in the bar and screwing into the gas-pipe. On the under side of the bar D is a metal plate D², which adds weight to that part of the bar, thereby causing the bar to gravitate, so as to normally maintain the sides of the bar in a vertical position, which is most favorable to the engagement of the bar with the ends of the bricks. A bolt D³ passes longitudinally through the pipe D' and connects one end of each of the pitman-rods D⁴ with the pipe. The opposite ends of the pitman-rods are connected with the crank-pins e' on the wheels E³. Guide-rollers D⁵ turn on spindles a³, suitably supported on the main frame, and the pitman-rods D⁴ move in contact with said rollers. The pitman-rods D⁴ are curved in such manner that when they are at the extreme rearward limit of their forward throw or at the extreme forward limit of their forward throw or at any stage of their forward throw between said limits the pitman-rods will move the push-bar D horizontally, so that the front face of the bar will engage squarely with the ends of the bricks C. During the first part (approximately one-quarter) of the return stroke the under sides of the pitman-rods engage with the rollers D⁵, so as to cause the projecting ends of the pitman-rods to be raised by the continued rotation of the crank-wheels turning the pitman-rods on the rollers D as fulcrums in such manner that as the return stroke is continued the push-bar will be raised, so that the next succeeding bricks may pass thereunder and come into such position that when the return stroke of the pitman-rods is completed the push-bar will be in position to engage with the ends of and push forward said last-named bricks. The position of the pitman-rods and push-bar during the first part of the return stroke is clearly indicated by dotted lines in Fig. 2.

A table F, Fig. 1, is secured on top of the main frame, and vertical standards F' are suitably secured to the table. Rollers G are journaled in boxes g, which slide in longitudinal slots f in the standards F'. Followers g' also slide in the slots f and are operated by screws f'. Springs g², interposed between the boxes g and the followers g', may be compressed or relaxed by tightening or loosening the screws f', so as to regulate the pressure of the rolls on the bricks passing under them.

Blocks H are adjustably connected with the table by bolts h^6 , passing through the table and through slots h^7 in the blocks. The plates H' are secured to the blocks H in any suitable manner. These plates are preferably made of spring-steel; but other suitable springy material may be used. The plates H' are placed on the table F approximately parallel and slightly inclined toward each other, so as to form between them a sanding-chamber, through which the bricks pass during the operation of sanding. The plates H' are of such rigidity that they will normally bear against the bricks with sufficient pressure to press sand into the surface of new-made and undried bricks and will exert pressure sufficient to produce the necessary rounding or molding of the edges of the bricks or to impress on the bricks the desired ornamental forms or configurations. They are also sufficiently elastic to yield under such undue pressure as would be likely to injure the bricks, thereby avoiding injury to bricks passing through the sanding-chamber. The free ends of the plates H' are provided with lateral extensions h , which serve to guide and steady the bricks while in contact with the plate H' . Tapering fillets h^7 of suitable contour, placed at the junction of the extensions h with the plates H' , serve to round or mold the edges of the bricks sliding along between and in contact with the plates.

Ribs h^2 or corrugations or other suitable means for impressing or forming on the bricks corrugations, ribs, or other desirable ornamentations or configurations may be used on the plates H' , or smooth plates without extensions, ribs, or other adjuncts may be used, without departing from the spirit of our invention.

The sand-boxes H^2 are rectangular in form and preferably have sloping bottoms h^3 , as shown in Fig. 3.

In the preferable form of construction the plate H' forms one side of the box H^2 , and a part of the metal of the plate H' is punched and bent inward, so as to form an opening h^4 , and also to form a wing h^5 , projecting into the sand-box. The wings h^5 serve to deflect the sand and guide it through the openings h^4 into contact with the surfaces of the bricks.

By loosening the nuts on the bolts h^6 the blocks H and the connected plates H' and the boxes H^2 may be moved so as to adjust the plates and boxes laterally relative to the bricks passing through the machine, and the nuts may then be tightened to clamp the blocks in the desired position. In the drawings we have illustrated a machine having one stationary central sand-box and two movable sand-boxes, one on each side of the central box, the distances between the boxes being equal to the width of a brick, the machine in this form being adapted to simultaneously sand and form two bricks. We do not, however, confine ourselves to the precise form, number, or relative arrangement of sand-

boxes shown, since boxes of different form and a greater or less number of boxes differently arranged relative to each other may be used.

Rods J, which are secured to the table F, project under the pipe D' and serve to prevent the push-bar D from dragging on the conveyer B or on the table F.

We are aware that sanding devices adapted to apply sand to all of the four sides of a moving slab of clay have heretofore been used; but we are not aware of the use of any device prior to our invention adapted to apply sand to two opposite surfaces only of separate bricks in such manner that when the bricks are piled in the kiln for burning there will be sand on those surfaces only of the bricks which are in contact with each other.

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

1. In a brick sanding and forming machine the combination of a table; resilient plates on said table laterally adjustable relative to each other; sand-boxes carried on said plates and adapted to apply sand to two opposite surfaces only of bricks contacting with said plates and rollers above and between said plates and adjustable vertically relative to bricks passing between said plates, as set forth.

2. In a brick sanding and forming machine the combination of a table, resilient plates on said table laterally adjustable relative to each other, sand-boxes carried on said plates and adapted to apply sand to two opposite surfaces only of bricks contacting with said plates; rollers above and between said plates adjustable vertically relative to bricks passing between said plates; and means adapted to intermittently propel bricks successively forward between said plates, as set forth.

3. In a brick sanding and forming machine, the plates H' having extensions h , fillets h^7 , openings h^4 and wings h^5 , in combination with; a table with which said plates are connected, and sand-boxes connected with said plates and adapted to discharge sand through the openings therein and apply same to the surfaces of bricks passing between said plates; as set forth.

4. In a brick-sanding machine the combination of a main frame, a conveyer-frame connected with said main frame; a continuously-moving conveyer on said conveyer-frame; a table secured to the main frame; a continuously-moving conveyer on said main frame; resilient plates on said table between and in line with said conveyers; sand-boxes carried on said plates and adapted to apply sand to opposite faces of separate bricks passing successively between said plates; and a reciprocating push-bar adapted to intermittently propel bricks forward between said plates; as set forth.

5. In a brick-sanding machine the combination of a main frame, a reciprocating propelling device having a gravitating push-bar,

rollers on the main frame guiding said propelling device, resilient plates supported in line with said propelling device and sand-boxes connected with said plates and adapted to apply sand to bricks passing between said plates, as set forth.

6. In a brick-sanding machine the combination of a table and sanding devices supported thereon parallel to each other and having discharge-openings adapted to discharge sand in a direction transverse to the line of travel of bricks passing between said sanding devices, as set forth.

7. In a brick-sanding machine the combination of a table, sanding devices supported parallel to each other on said table and having transverse discharge-openings and means adapted to automatically propel bricks between said sanding devices, as set forth.

8. In a brick-sanding machine the combination of a table, a central sanding device having transverse discharge-openings and lateral sanding devices parallel to said central sanding device and each having a discharge-opening in that side thereof which is adjacent to the central sanding device, as set forth.

9. In a brick-sanding machine the combination of a table, a central sanding device supported thereon and lateral sanding devices parallel to said central sanding device and having yielding plates as set forth.

10. The combination in a brick-sanding machine, of a central sanding device, lateral sand-

ing devices parallel to said central sanding device and a reciprocating push-bar adapted to propel bricks between said sanding devices, as set forth.

11. In a brick-sanding machine, in combination with devices for intermittently moving separate bricks, a sanding-chamber provided with vibrating and springy side walls, means for supplying sand to said chamber, and forming devices at the discharge end of said chamber, substantially as and for the purpose specified.

12. In a brick-sanding machine, the combination of a table, springy plates connected with said table and sand-boxes connected with said plates and adapted to apply sand to bricks passing between said plates, as set forth.

13. In a brick-sanding machine, in combination with devices for intermittently moving separate bricks, a sanding-chamber provided with vibrating and springy side walls, and means for supplying sand to said chamber substantially as and for the purpose specified.

In witness whereof we have hereunto subscribed our names, at Springfield, Illinois, this 19th day of November, 1895.

ALBERT L. CONVERSE.
JOHN T. UNDERWOOD.

Witnesses:

S. D. SCHOLES,
J. L. MASON.