

R. McKNIGHT.

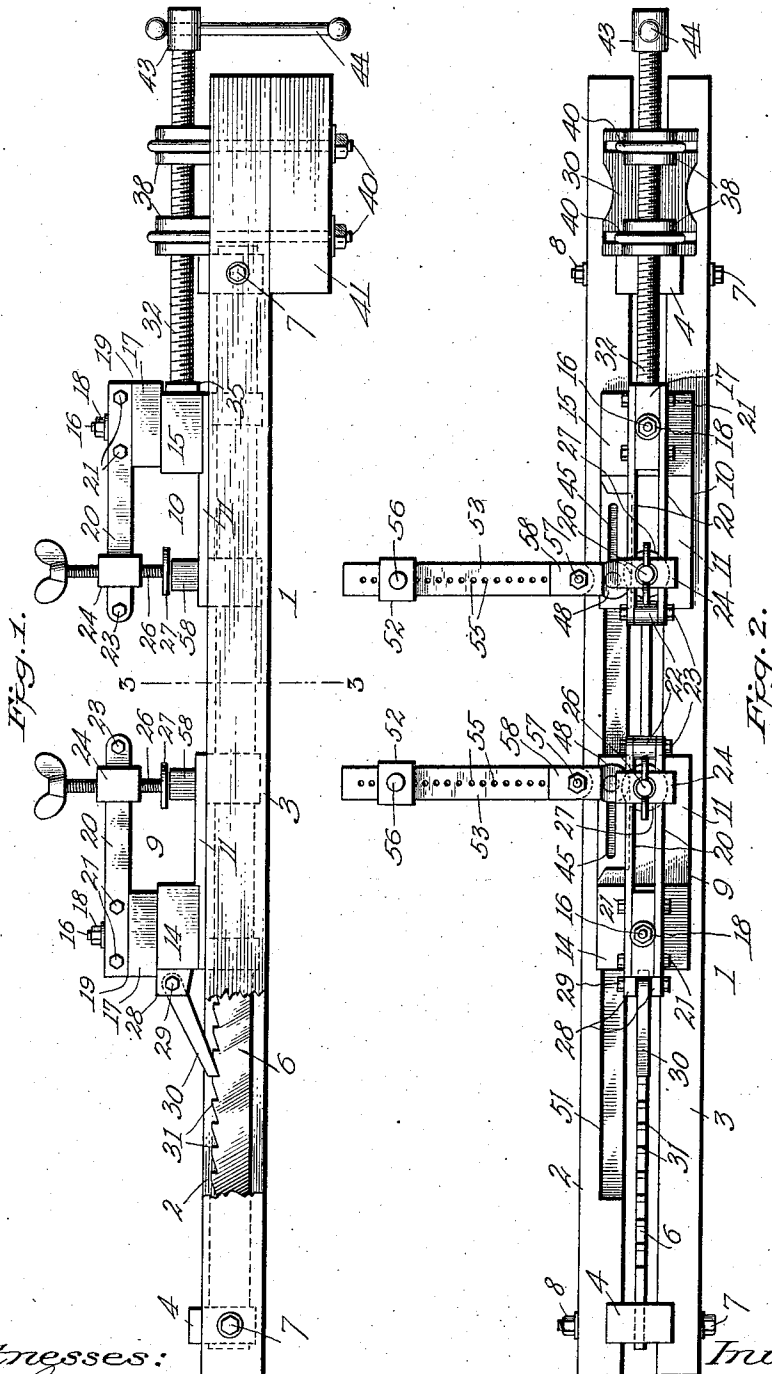
CLAMP FOR USE IN THE PRODUCTION OF SCREEN AND WINDOW FRAMES, DOORS, &c.

APPLICATION FILED OCT. 9, 1911.

1,028,584.

Patented June 4, 1912.

2 SHEETS-SHEET 1.



Witnesses:

G. Sargent Elliott
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By

H. S. Bailey.

Inventor:

Richard M. Knight

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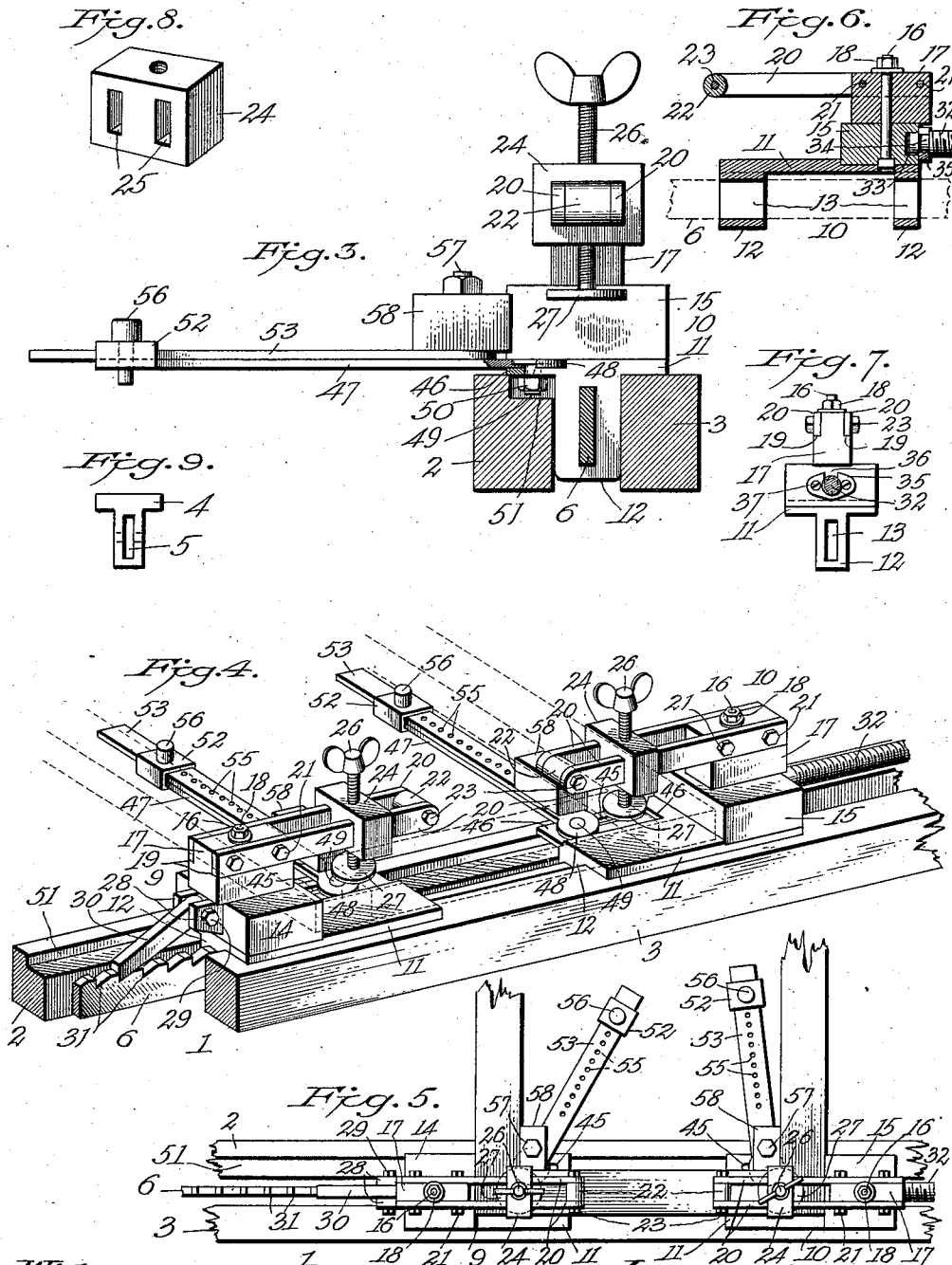
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UNITED STATES PATENT OFFICE.

RICHARD McKNIGHT, OF DENVER, COLORADO.

CLAMP FOR USE IN THE PRODUCTION OF SCREEN AND WINDOW FRAMES, DOORS, &c.

1,028,584.

Specification of Letters Patent.

Patented June 4, 1912.

Application filed October 9, 1911. Serial No. 653,549.

To all whom it may concern:

Be it known that I, RICHARD McKNIGHT, a citizen of the United States of America, residing in the city and county of Denver and State of Colorado, have invented a new and useful Clamp for Use in the Production of Screen and Window Frames, Doors, &c., of which the following is a specification.

This invention relates to improvements in clamps for use in the production of screen and window frames, doors, etc., and particularly to frame work of this character, where the parts are connected by metallic dowel plates.

The object of the invention is to provide a clamp comprising a support upon which are mounted cooperating, independently movable carriages, having rigid lateral pressure clamp blocks, adjustable vertical pressure clamp plates, and adjustable abutments, whereby two side pieces of a frame may be clamped against an end piece by the lateral clamps, and held against upward movement by the vertical clamps, the abutments defining the position of the end piece. Further, to provide carriages having clamps and abutments as above described, said carriages being slidably mounted on a bar or track, one of said carriages having a pawl adapted to engage teeth upon said track thereby to define the position of the carriage, while the other carriage is screw-propelled. These objects are accomplished by the mechanism illustrated in the accompanying drawings, in which:

Figure 1, is a side view of the improved clamp, the support of which is partly broken away for clearer illustration. Fig. 2, is a plan view of the same. Fig. 3, is a transverse, sectional view enlarged on the line 3—3 of Fig. 1. Fig. 4, is a perspective view of the clamp, a portion only of the support or base being shown. Fig. 5, is a plan view of the clamp with a frame held therein, the end portion of the support being omitted. Fig. 6, is a vertical longitudinal sectional view of one of the carriages. Fig. 7, is an end view of the same. Fig. 8, is a perspective view of one of the slide blocks which supports one of the vertical pressure clamp plates. And Fig. 9, is a front view of one of the supports or hangers for the carriage rail.

Similar letters of reference refer to similar parts throughout the several views.

Referring to the accompanying drawings,

1 indicates the clamp support or base proper, which comprises parallel longitudinally disposed bars 2 and 3 respectively, which are spaced by T-shaped blocks 4 (see Fig. 9), the stems of which lie between the bars, while their heads rest upon the bars, as will be understood by reference to Figs. 1 and 2. These blocks are located near the ends of the bars and their stems or depending members are provided with oblong apertures 5, in which is supported a rail or track 6. The bars 2 and 3 are clamped against the T-blocks by bolts 7, which pass through the said bars, blocks and track, nuts 8 being screwed upon the outer ends of the bolts, against the adjacent bar. Slidably mounted upon the bars 2 and 3, and track 6, are carriages 9 and 10, each of which comprises a base plate 11, which rests upon the bars 2 and 3, and which is provided with depending lugs 12, having oblong apertures 13, through which the track 6 passes. By this connection with the track, the carriages are limited to a back and forth sliding movement, and the track fits the lug apertures snugly enough to prevent either lateral or vertical play of the said carriages.

Upon the outer end of the base plates 11 are secured in any suitable way, metal blocks 14 and 15 respectively, which constitute lateral pressure clamps. These clamps are of a suitable thickness and extend the full width of the base plates. A bolt 16 extends up through each clamp block and upon these bolts are pivotally mounted blocks 17, which rest upon the said clamp blocks, and are held against upward movement by nuts 18, which are screwed upon the ends of the bolts 16. The inner ends of the blocks 17 lie slightly back of the inner ends of the clamp blocks 14 and 15, as shown, in order that when the said blocks 17, are turned upon their pivot bolts, they will not extend over the inner ends of the said clamp blocks and thereby interfere with material clamped between the said clamp blocks. Steps 19 are formed on opposite sides of the blocks 17, and upon the steps of each block rest parallel bars 20, which are secured to the blocks by bolts 21. These pairs of bars extend toward each other and above the base plates of their respective carriages, and spacing sleeves 22 are supported between their inner ends upon bolts 23, which pass through the bars and sleeve, and these sleeves maintain the bars in parallel relation. Each pair of bars 20 consti-

tutes a support upon which is slidably mounted a block 24, having parallel rectangular apertures 25 through which the said bars pass. Centrally through each block is
 5 threaded a vertically disposed thumb screw 26, upon the lower end of which is secured a disk or plate 27, which with the thumb screw constitutes a clamp. Thus the supports 20 may be swung in the arc of a circle upon the
 10 pivot bolts 16, and the slide blocks may be adjusted upon the said supports in order to properly position the screw clamps, for a purpose to be fully set forth hereinafter.

Upon the outer end of the block 14, of the carriage 9, are formed ears 28, through which is passed a bolt 29 upon which and between the said ears is pivotally mounted a gravity pawl 30, the free end of which is adapted to engage notches or teeth 31, in
 20 the upper edge of the track 6, in order to hold the carriage at a desired point of adjustment, against outward movement.

To the outer end of the block 15, of the carriage 10, is pivotally attached the inner end of a screw 32, by which the carriage is moved back and forth. The block 15 has a circular recess 33, into which the end of the screw extends, and adjacent to this end the screw is formed with an annular groove
 30 34. A plate 35, having a U-shaped recess 36, of the same width as the diameter of the said groove, straddles the grooved portion of the screw, and is secured to the end of the block 15 by bolts or screws 37. The
 35 shoulders formed by the groove 34 engage the marginal edge of the recess 36, and thereby connect the screw to the block 15, but so as to permit of the free rotation of the screw. The screw passes through threaded
 40 apertures in blocks 38, which form an integral part of a plate 39, which rests upon the adjacent ends of the bars 2 and 3, and is preferably embedded in them. This plate is rigidly secured to the said bars by U-
 45 shaped bolts 40, which straddle the blocks 38, and extend down through the plate 39, and through holes in the bars 2 and 3, and blocks 41, upon the under sides of the bars, their ends receiving nuts which are screwed
 50 against the blocks, thereby holding the plate and its blocks 38, against movement in any direction. The blocks 38 are preferably formed with grooves to receive the U-bolts. The outer end of the screw is provided with
 55 an enlarged portion or head 43, having a transverse hole, in which is slidably supported a handle 44, as is usual in screws of this character. Thus, when the screw is turned, it feeds through the blocks 38 and
 60 either pushes or pulls on the carriage 10, which is thereby moved forward or backward upon the track 6.

The carriage plates 11 are provided with slots 45, adjacent to their rear edges, which
 65 extend parallel with the track 6, and the

plates at this point are reduced in thickness from their rear edges to points a suitable distance beyond the slots, as is indicated by the numeral 46 in Figs. 3 and 4. Upon these reduced portions of the plates are
 70 slidably and pivotally mounted arms 47, having apertured head portions 48, through which are passed flat headed bolts 49, which extend down through the slots 45, and receive
 75 nuts 50, which are screwed against the under sides of the plates 11, as clearly shown in Fig. 3, the bar 2 being cut away or recessed for a portion of its length, as shown at 51, to accommodate the said nuts and thus permit the carriage to move freely back
 80 and forth. The arms 47 lie flush with the surfaces of the thicker portions of the plates 11, and the flat heads of the bolts 49 lie in counter sinks in the arms 47, and are flush with the surfaces of the said arms, as clearly
 85 shown in Fig. 3. The outer ends of the arms 47 are provided with guides 52, through which are passed the rear ends of arms 53, which lie flat upon the arms 47. The arms 53 are adjustable in the guides 52, and are
 90 provided with a series of apertures 55. An aperture is formed through each guide and through each arm 47, those in each arm and guide being in alinement so as to receive a
 95 pin 56, which also passes through one of the apertures 55 in the arm 53, so as to hold the arm at the desired point of adjustment. The forward ends of these arms are provided with upright bolts 57, upon which are
 100 pivotally mounted abutment blocks 58, against which is laid one of the side or end members of the frame. The arms 53 may be moved back or forth through the guide 52, to the desired points of adjustment, and secured at these points by passing the pins
 105 56 through the apertures in the arms and guide as previously explained. The arms 47 with the arms 53, may be swung either toward each other or away from each other, so as to be out of the way of the side pieces
 110 of the frame, and the abutments 58, being pivotally mounted upon the arms 53, will adjust themselves to the straight edge of the end piece of the frame, when it is laid against them, as will be understood by reference to Fig. 5. The carriages are easily
 115 adjustable to frames of varying widths, and the abutments are also easily adjusted to accommodate end pieces of different widths.

In operation, the carriages are moved
 120 apart the required distance, and an end piece of a frame is laid upon the two carriages, against the abutments 58, which have previously been adjusted to suit the width of the material of which the frame is made, or
 125 in other words, to bring the end piece directly beneath the clamps 27. The side pieces are then laid against the opposite ends of the end piece, as shown in Fig. 5, and the clamp screws adjusted, by swinging the sup-
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ports 20, when necessary, and sliding the blocks 24 until the clamp plates 27 stand centrally above the meeting edges of the end and side pieces. The carriage 9, having been previously locked at the desired point by dropping the pawl 30 into engagement with one of the rail teeth 31, the carriage 10 is moved toward the carriage 9, and the side pieces of the frame are engaged by the abutments 14 and 15, and pressed as tightly as necessary against the ends of the end piece, and the clamps 27 are screwed down upon the abutting ends of the frame with sufficient force to hold the frame tightly upon the carriage plates 11. The lateral and vertical pressures securely hold the parts of the frame in proper relative positions, and prevent their movement, while they are connected by suitable metal dowel plates, which are driven into the frame at the abutting points of the side and end pieces.

The dowel plate is not illustrated, as it forms no part of the present invention.

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

1. In a clamp as specified, the combination with a support, of carriages slidably mounted thereon, rigid lateral pressure clamp blocks on the outer ends of said carriages, adjustably mounted vertical pressure screw clamps on said carriages; means for locking one of said carriages against outward movement; and means for moving the other carriage toward the locked carriage, and at the same time holding it against reverse movement.

2. In a clamp as specified, the combination with a support, of carriages slidably mounted thereon having rigid abutments on their outer ends, supports pivotally mounted on the abutments, vertical pressure screw clamps adjustable horizontally on said supports, a screw for moving one of said carriages back and forth, and means for locking the other clamp against outward movement beyond a desired position.

3. In a clamp as specified, the combination with a support, of carriages slidably mounted thereon, having rigid abutments upon their outer ends; supports pivotally mounted on the abutments; blocks slidably mounted on the supports; vertically disposed screw clamps carried by said blocks; a feed screw for operating one of said carriages; and a stop device for locking the other carriage against further outward movement after the same has been adjusted.

4. In a clamp as specified, the combination with a support, of carriages slidably mounted thereon, having rigid lateral pressure abutments; horizontal supports pivotally mounted upon said abutments; blocks slidably mounted on the supports and screw clamps extending vertically through

said blocks; adjustable abutment blocks mounted on the carriages and facing at right angles to the said rigid abutments; a feed screw for operating one of said carriages and a stop device for locking the other carriage against further outward movement after the same has been adjusted.

5. In a clamp as specified, the combination with a support including a guide rail, of carriages mounted upon said rail having rigid lateral pressure abutments; supports pivotally mounted on the abutments; slide blocks on the supports and thumb screws extending down through the blocks and provided with clamp plates at their lower ends; laterally adjustable pivotally mounted arms on the carriages; adjustable pivotally mounted abutments on said arms facing at right angles to the rigid abutments; a feed screw for operating one of the carriages; and a stop device for locking the other carriage against further outward movement after the same has been adjusted.

6. In a clamp as specified, the combination with a rail of carriages slidably mounted thereon, having guides through which said rail passes; rigid lateral pressure abutments on the carriages; laterally adjustable vertical pressure screw clamps on the abutments; adjustable abutments on the carriage which face at right angles to the rigid abutments; means for locking one carriage against outward movement; and a screw for operating the other carriage.

7. In a clamp as specified, the combination with a support, cooperating carriages slidably mounted thereon, having rigid lateral pressure abutments; a screw for operating one of the carriages; and means for locking the other carriage against outward movement; of horizontal supports pivotally mounted on the abutments; slide blocks on the supports; thumb screws extending through the blocks and provided with clamp plates on their lower ends; laterally adjustable, pivotally mounted arms carried by the carriages; arms adjustable back and forth on said first mentioned arms; and pivoted abutments on said last mentioned arms which face at right angles to the said rigid abutments.

8. In a clamp as specified, the combination with a support, of cooperating carriages slidably mounted thereon, having rigid lateral pressure abutments, adjustable pivotally mounted abutments which face at right angles to the rigid abutments, and adjustable, vertical pressure screw clamps; means for locking one carriage against outward movement; and a screw for operating the other carriage.

9. In a clamp as specified, the combination with a support, of cooperating carriages slidably mounted thereon having rigid lateral pressure abutments; blocks pivotally

mounted on the abutments; horizontal supports secured to said blocks; slide blocks on said supports; thumb screws extending through the slide blocks and clamp plates on their lower ends; abutments pivotally mounted and laterally adjustable upon said carriages which face at right angles to the rigid abutments; manually operated means connected with one carriage for moving the same back and forth; and a stop device for preventing outward movement of the other carriage.

10. In a clamp as specified, the combination with a support; cooperating carriages slidably mounted thereon, having rigid lateral pressure abutments; vertical screw clamps adjustably mounted on the rigid abutments; a screw for operating one carriage; and a stop device for preventing outward movement of the other carriage; of arms laterally adjustable and pivotally secured at their forward ends on the rear portions of the carriages; arms adjustable on and parallel with the first mentioned arms; and abutments pivotally mounted on the forward ends of the second mentioned arms.

11. In a clamp as specified, the combination with a support, of cooperating carriages slidably mounted on the support, having lateral pressure abutments; vertical pressure screw clamps adjustably mounted on the abutments; arms laterally adjustable and pivotally mounted on the rear sides of the carriages; said arms standing normally at right angles to the carriages; guides on the rear ends of the arms; arms adjustably mounted in the guides and parallel with the first arms; abutments pivotally mounted on the front ends of the second arms; teeth on the carriage support; a pawl on one of the carriages for engaging said teeth; and a feed screw for moving the other carriage.

12. In a clamp as specified, the combination with cooperating carriages, having longitudinal slots, of lateral pressure abutments on said carriages; inwardly extending supports pivotally mounted on the abutments; blocks slidable on the supports, and thumb screws extending through said blocks having clamp plates on their lower ends; bolts slidable in said longitudinal slots; arms pivotally secured at their forward ends upon said bolts, having guides upon their rear ends; arms adjustable in said guides and provided with a series of apertures; pins which pass through apertures in said guides and through an aperture in said second mentioned arms to hold them at a desired point of adjustment; pivotal abutments on the forward ends of said second

mentioned arms; a pawl and ratchet device for locking one of the carriages against outward movement; and a feed screw for moving the other carriage.

13. In a clamp as specified, the combination with spaced parallel supporting bars, and a guide rail supported between said bars, provided with ratchet teeth adjacent to one end, of cooperating lateral pressure clamps slidably mounted on the supports, having depending apertured lugs through which the guide rail passes; inwardly extending pivotally mounted arms on the clamps; blocks slidably mounted on said arms and thumb screws extending through said blocks, having clamp plates on their lower ends; laterally adjustable, pivotally mounted abutments on the clamps which face at right angles to said clamps; a feed screw for moving one of said clamps; and a pawl on the other clamp for engaging the teeth in said guide rail.

14. In a clamp as specified, the combination with a support, comprising spaced parallel bars, and a guide rail mounted between said bars, of plates slidably mounted on the bars having longitudinal slots and apertured depending lugs through which the said guide rail passes; cooperating lateral pressure abutment blocks on the plates; inwardly extending supports pivotally mounted on the abutment blocks above the plates; blocks slidable on the supports, having vertically disposed screw clamps mounted therein; bolts extending through the slots; arms pivotally mounted on said bolts; arms adjustably mounted on the first mentioned arms, and having pivotal abutments on their forward ends; a feed screw for moving one of said plates; and a stop device for holding the other plate at a desired point against outward movement.

15. In a clamp as specified, the combination with a support, of carriages slidable thereon, having cooperating lateral pressure clamp blocks; adjustable vertical pressure screw clamps; laterally adjustable pivotally mounted abutments facing at right angles to the clamp blocks; a feed screw for operating one carriage; and a stop device for defining the outward movement of the other carriage.

In testimony whereof I affix my signature in presence of two witnesses:

RICHARD McKNIGHT.

Witnesses:

CHARLES H. LANGDON,
GERTRUDE E. DOWNTON.