(No Model.) 3 Sheets—Sheet 1.

H. E. MOOMAN.

COMBINATION LOCK.

No. 565,363. Patented Aug. 4, 1896.

Fig. 1.

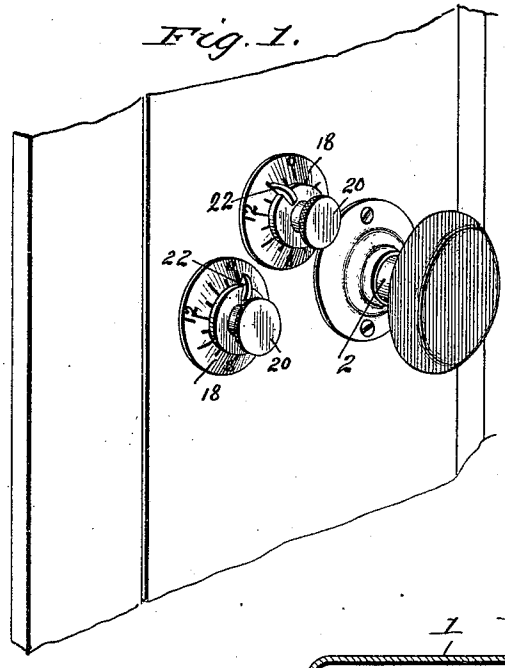


Fig. 2.

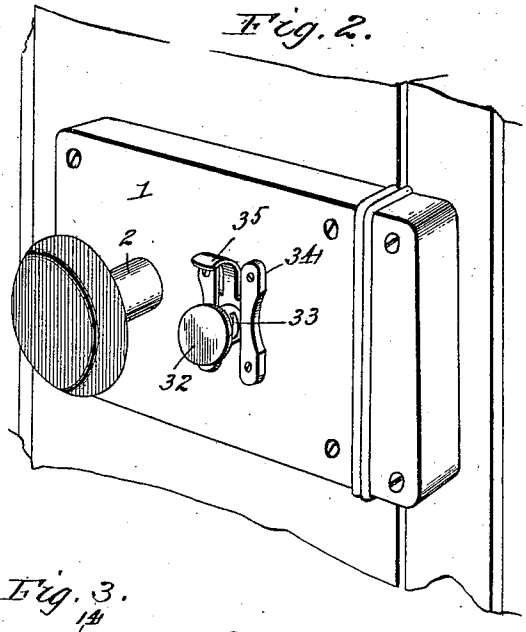


Fig. 3.

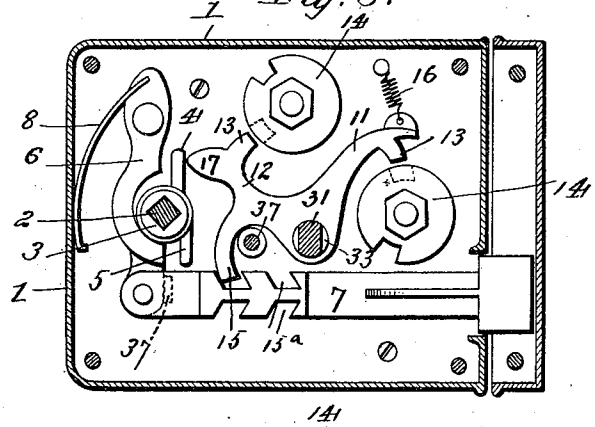
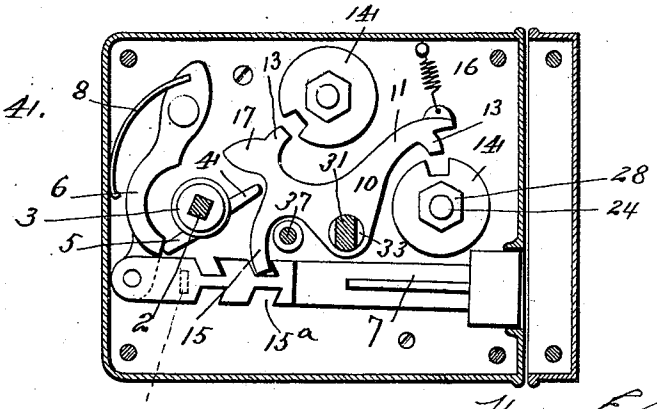


Fig. 4.



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(No Model.) 3 Sheets—Sheet 2.

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Fig. 5.

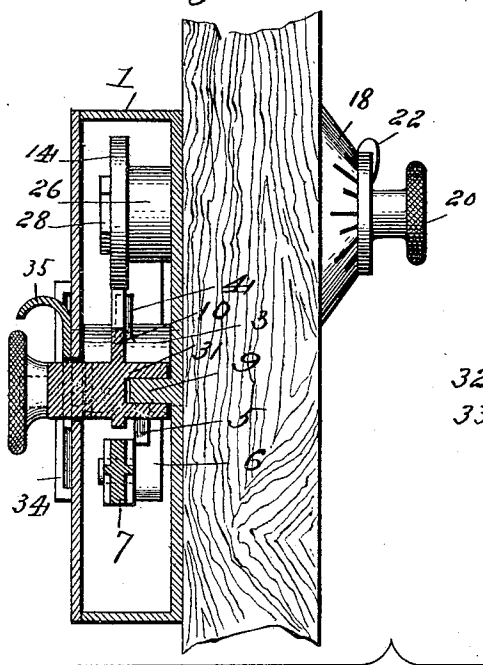


Fig. 6.

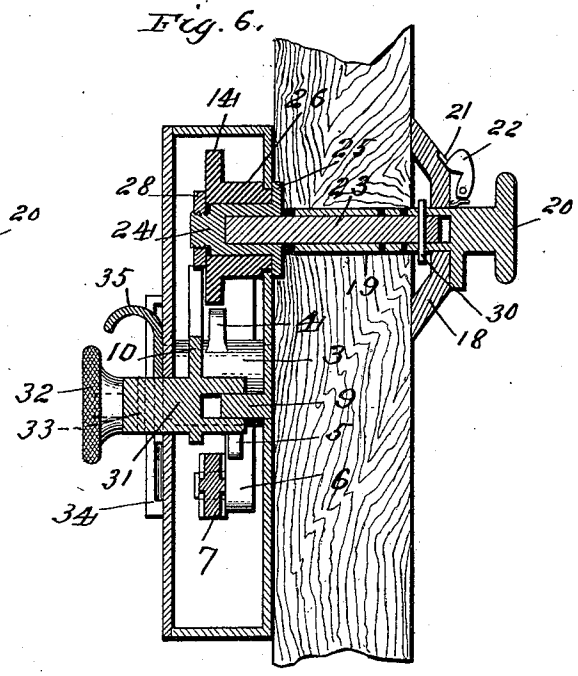
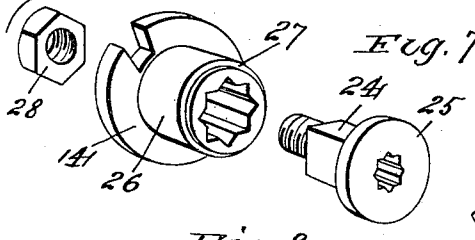


Fig. 7.



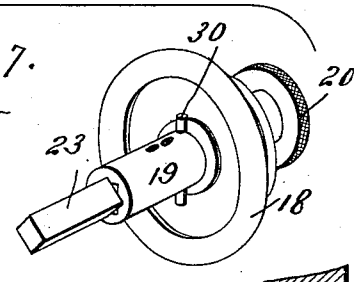


Fig. 8.

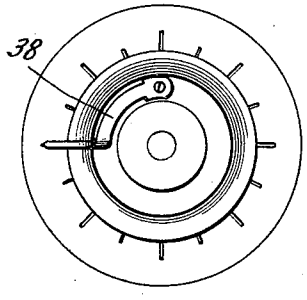


Fig. 9.

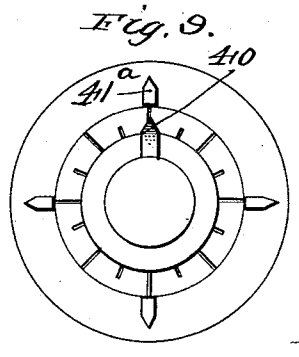


Fig. 10.

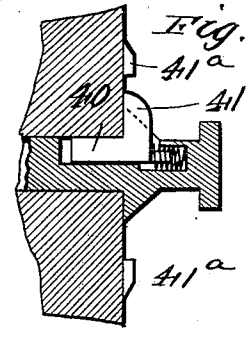


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Fig. 11.

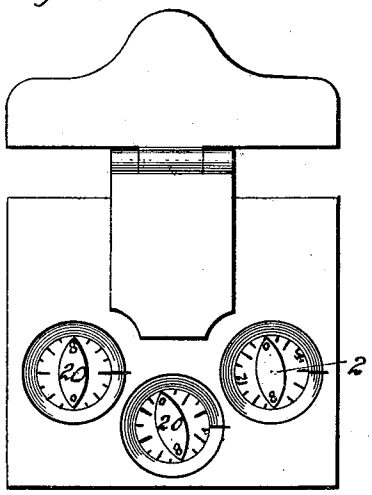


Fig. 12.

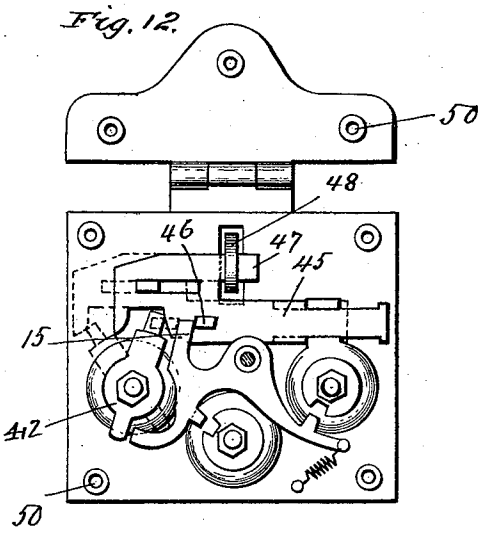


Fig. 13.

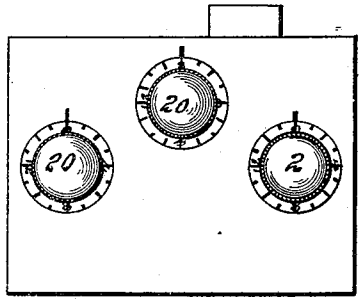


Fig. 14.

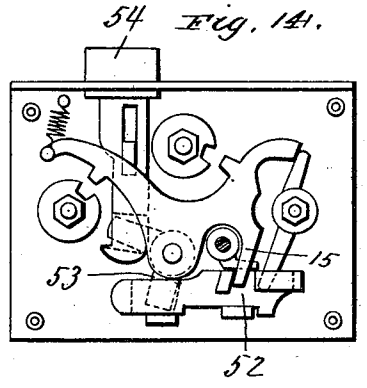
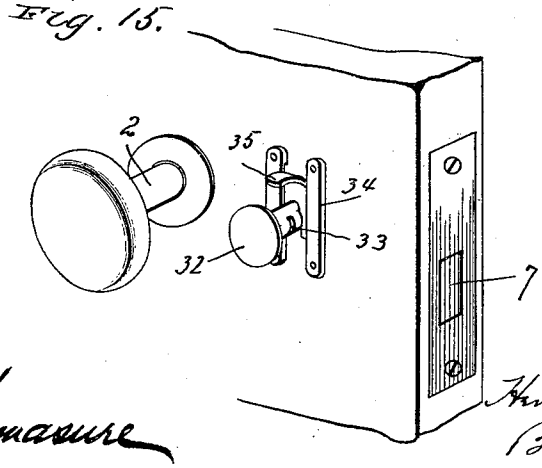


Fig. 15.



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UNITED STATES PATENT OFFICE.

HENRY E. MOOMAN, OF SALEM, VIRGINIA, ASSIGNOR OF TWO-THIRDS TO O. L STEARNES AND JAMES WYLIE, OF SAME PLACE.

COMBINATION-LOCK.

SPECIFICATION forming part of Letters Patent No. 565,363, dated August 4, 1896.

Application filed April 22, 1896. Serial No. 588,655. (No model.)

To all whom it may concern:

Be it known that I, HENRY E. MOOMAN, a citizen of the United States, residing at Salem, in the county of Roanoke and State of Virginia, have invented certain new and useful Improvements in Combination-Locks, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in permutation or combination locks; and it has for its object to provide a simple and durable lock of that character adapted for use on house-doors, trunks, and similar receptacles.

The invention consists in the novel combination, arrangement, and construction of the various parts, as will be more fully hereinafter described, and particularly pointed out in the claims appended.

In the drawings, Figure 1 is a perspective view of the outer side of a portion of a door; and Fig. 2 a similar view of the inner side thereof, showing my lock in place. Fig. 3 is a rear view of the house-door lock, the casing being in section. Fig. 4 is a similar view showing the parts in a different position. Fig. 5 is a vertical section of the lock. Fig. 6 is a similar view showing the tumbler in its drawn-out position. Fig. 7 is a perspective view of one of the notched disks and its supporting and operating parts. Figs. 8, 9, and 10 are details of modifications of the knob for operating the notched disks. Figs. 11 and 12 are respectively a face and rear view of the lock adapted for use on trunks or chests. Figs. 13 and 14 are similar views of another form of the lock adapted for use on drawers and desks or closets. Fig. 15 is a detail view showing the lock used as a mortise-lock.

Referring to the various parts by numerals, 1 designates the lock-casing, which may be secured to the inner side of the door, as shown in Fig. 2, or it may be set in a mortise in the door, if desired. Passing through the casing near its rear end is the bolt-operating spindle 2, which carries on its outer ends any suitable form of knob. On this spindle within the casing is a sleeve 3, which carries an upwardly-extending arm 4 and a downwardly-extending arm 5, said arms being in different vertical planes, the arm 5 being nearer the inner side of the casing 1. Pivoted within the casing at the rear of the spindle 2 is a depending lever 6, whose lower end extends below the operating-spindle and is pivotally connected to the rear end of the latch-bolt 7. A spring 8 is connected to the lever above its pivot and bears against the rear wall of the casing 1 and forces the lower end of the lever 6 and the latch-bolt 7 normally forward. The lower arm of sleeve 3 is adapted to bear against the lever 6 and force the same rearwardly.

Mounted approximately in the center of the casing on a stud 9 is a pivoted tumbler 10. This tumbler has a tubular bearing upon the stud and is adapted to slide back and forth upon it. The pivot of the tumbler is approximately at its center between the forwardly-extending arm 11 and the rearwardly-extending arm 12. Each of these arms is provided with a dog or lug 13, which is adapted to engage a notch in the rotatable disk 14, mounted adjacent each arm of the tumbler 10. The rear arm of the tumbler is formed with a downwardly-extending lug 15, which is adapted to engage any one of a series of notches 15^a, formed in the latch-bolt. A spring 16 is connected to the upper side of the arm 11, and normally forces the lug 15 down into one of the notches in the latch-bolt. From the rear side of the arm 12 a stud or projection 17 extends into the path of the arm 4 of sleeve 3, said arm being adapted to engage said projection and turn the tumbler upon its pivot.

To indicate the position of the notch in each disk 14 in relation to the lug on the adjacent arm of the tumbler and to rotatably support each disk 14, I secure a dial 18 to the outer side of a door and mount on said dial a horizontal tubular shaft 19, which extends through the door and is provided on its outer end with an operating-knob 20. This dial is suitably marked and is formed with indentations 21, into which a spring-pressed dog 22, carried by the knob, clicks as the knob is rotated. Secured within the shaft 19 is a square extension 23, said square extension being capable of a rotative and longitudinal adjustment within the shaft 19. On the inner end of this extension of shaft 19 is removably fitted a square cap or sleeve 24, which is capable of a rotative adjustment thereon. Formed on the rear edge of said

cap is a radial flange 25, which fits against the outer side of the lock-casing, the forward end of the cap extending into the lock, its extreme forward end being reduced and threaded. Each notched disk is formed with the sleeve 26, which fits over the square portion of the cap 24, the rear end of said sleeve being reduced to pass through the lock-casing, its rear face bearing against the flange 25. The reduced part of the sleeve 26 forms a shoulder 27, which abuts against the inner side of the lock-casing. A nut 28, screwed on the threaded end of cap 24, which extends beyond the face of disk 14, holds the parts in position. The disk 14 is rotatably adjustable upon the cap 24 by means of the eight-cornered opening therein, the corners of the cap entering four of the corners of the opening. The cap 24 is adjustable around the square extension 23 of the shaft 19, and the extension is adjustable within the shaft 19 by similar arrangements. A pin 30 secures the extension 23 within the shaft 19. It is manifest that these parts may be rotatively secured to each other in any suitable manner, and I do not wish to limit myself to the means described and shown.

The operation of this portion of my invention is as follows: The disks 14 are placed upon the operating-shafts in such a position that the desired combination will bring the notches in the disks in line with the lugs on the tumbler. To open the door, the knobs 20 are turned until the dogs 22 indicate the proper combination, the operating-spindle is then turned and arm 4 of sleeve 3 engages part 17 of the tumbler and raises it, the dogs 13 of the arms 11 and 12 enter the notches of disk 14, and dog 15 is raised from the notch in the latch-bolt. Arm 5 of sleeve 3 now contacts with lever 6 and swings it rearwardly and withdraws bolt 7. Arm 4 now passes part 17 and the spring 16 springs dog 15 into another notch in the latch-bolt and holds the bolt in its rearward position.

The combination may be varied, as desired, by rotatively adjusting the parts 23, 24, and 26 as described.

In order to adapt the lock for use as an ordinary catch, the tumbler is slidably mounted on its pivot, and is provided with a stem 31, which projects through the lock-case, its outer end being provided with a knob 32. In this stem are formed on each of its sides two parallel vertical grooves 33, and slidably mounted in ways 34 upon the outer side of the lock is a catch 35, which fits on the stem 31 and engages the grooves 33.

When it is desired to disengage the tumbler from the bolt 7 and the arm 4 of the sleeve to adapt the lock for use as a catch, the stem 31 is drawn out and the latch 35 is slid down into the innermost set of grooves 33, as shown in Fig. 6, and the tumbler will then be held out of the path of the arm 4. In this position the bolt may be drawn back by simply turning the operating-spindle, as is manifest. When the catch is slid into the outermost set of grooves, the tumbler will be held in the path of the arm 4 and bolt 7, as shown in Fig. 5.

Suitable stops 37 are secured to the casing to limit the movement of lever 6 and tumbler 10. The bolt 7 is formed with notches 15^a on its upper and lower edges, in order that the bolt may be turned over to reverse the beveled head of the bolt and adapt the lock for use on doors swinging in different directions.

In place of the dogs 22 for use on the dials a flat spring 38 may be secured on the knob. The end of this spring is turned inwardly and is passed through a notch in the edge of the knob, said inner end engaging the recesses in the dial, as shown in Fig. 8. In Figs. 9 and 10 is shown another modification of the indicator. In this construction a spring-pressed bolt 40 is slidably mounted in a slot in the knob, the dog 41, formed thereon, engaging the recesses formed in the dial or in the face of the lock. If desired, projections 41^a may be formed on the dial at certain points to enable a person to work the combination at night by feeling the projections and thereby ascertaining the exact location of the marks on the dial.

In Figs. 11 and 12 is shown a form of my lock adapted for use on trunks, chests, and similar receptacles. In this form the operating-spindle is provided with a knob having the appearance of a dial, and said knob and the dials and knobs for operating the notched disks are countersunk in the supporting-plate in order to protect them. One of the arms carried by the operating-spindle engages one end of a horizontally-sliding bolt 45, and the other arm engages an extension of the tumbler. Instead of the dog 15 of the tumbler engaging recesses in the latch-bolt it engages a projection 46 on the bolt and holds it in either of its positions. The latch-bolt is formed with one arm 47, which engages the loop 48 of the hasp, which may be fastened to the trunk-lid, as shown in Fig. 12. The notched disks are rotatively adjusted upon their supporting-spindles by loosening their securing-nuts, turning them to the desired point, and then again screwing home the securing-nuts. The hasp and plate carrying the mechanism are secured to the receptacle by screwing screws from the inner side of the receptacle into the threaded lugs 50, formed on the plate and hasp.

In Figs. 13 and 14 is shown a form of my lock adapted for use on desks, drawers, closets, and similar places. In this form the operating-spindle is also formed with a knob and dial similar to the knobs and dials of the notched disks. This arrangement is used in order to add to the confusion of an evil-disposed person who, not knowing the proper combination, should try to operate the lock. In this form one of the arms carried by the operating-spindle engages one end of a short horizontal bolt 52, and con-

nected to the other end of said bolt is one arm of an angle-lever 53. This lever is pivoted on the same pivot with the tumbler, and its other arm engages one end of the vertical latch-bolt 54. The other arm on the operating-spindle engages an extension on the tumbler, and the dog 15 of the tumbler engages a projection on the bolt 52, and holds said bolt in either of its positions. The notched disks may be adjusted upon their operating-spindles in any suitable manner.

It will thus be seen that I provide an extremely simple and efficient combination-lock, which, with slight changes in some of the unimportant details of construction, may be adapted for use in a great variety of places, and while being extremely simple, yet affords the greatest degree of safety.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a lock, the combination of a casing, an operating-spindle carrying a pair of arms, a latch-bolt, spring actuated and adapted to be withdrawn by one of the arms of the operating-spindle, a pair of notched rotating disks mounted on separate spindles, means for indicating the position of the notches in said disks, and a tumbler pivoted in the lock-casing and provided with a pair of dogs adapted to engage the disks and another dog adapted to engage the latch-bolt and a cam projection adapted to be engaged by the other arm on the operating-spindle, substantially as described.

2. The combination of a lock-casing, notched rotating disks, a tumbler provided with dogs adapted to engage the disks, a reversible latch-bolt notched on its opposite edges, a dog carried by the tumbler and adapted to engage the latch-bolt in both its positions, and means for operating the tumbler and the latch-bolt, substantially as described.

3. In a permutation-lock the combination of a casing, an operating-spindle, a latch-bolt adapted to be operated by the spindle, a pivoted tumbler adapted to lock the latch-bolt and to be operated by the operating-spindle, said tumbler being mounted to slide upon its pivot whereby it may be moved bodily out of the path of the arm on the operating-lever, and means which may be adjusted to lock the tumbler against pivotal motion or to permit it to have such motion when in the path of the arm on the operating-spindle, substantially as described and for the purpose set forth.

4. In a permutation-lock the combination of a casing, an operating-spindle, a latch-bolt adapted to be operated by the spindle, pivoted tumbler adapted to lock the latch-bolt and be operated by the operating-spindle, said tumbler being mounted to slide upon its pivot as described, a stem on said tumbler in line with the pivot and projecting out of the casing, a catch to engage said stem and hold the tumbler in its inner or outer position, and means which may be adjusted to lock the tumbler against pivotal motion when it is in the path of the arm on the operating-spindle or to permit it to have such motion, substantially as described and for the purpose set forth.

5. In a permutation-lock the combination of a casing, a tumbler pivoted therein and having a plurality of dogs, a notched disk adjacent each dog, means for supporting and for rotatively adjusting said disks, said means consisting of a revoluble shaft, a cap rotatively adjustable upon the inner end thereof and extending into the lock-casing, a sleeve rotatively adjustable upon said cap within the lock, and means for securing said sleeve upon the cap, said sleeve carrying the notched disk, means for indicating the position of the notches in the disk, a latch-bolt, and means for operating it and for operating the tumbler, substantially as described and for the purpose set forth.

6. A combination-lock comprising a casing, a latch-bolt, an operating-spindle, a tumbler, means for permitting said tumbler and latch-bolt to be operated, said means consisting of a plurality of rotatable disks, each disk being mounted upon an adjustable shaft formed on the tubular part 19 and extension 23, cap 24 formed with flange 25, sleeve 26 carrying the notched disk, and securing-nut 28, means for indicating the position of the notch in the disk consisting of spring-dog carried by the shaft, and adapted to engage a recessed dial, substantially as described and for the purpose set forth.

7. In a dial and indicator for combination-locks the combination of a knob, a flat spring secured thereto, its end being bent and passed through a notch in the edge of the knob, a dial formed with recesses in its face adapted to be engaged by the projecting end of the spring as the knob is revolved, substantially as described and for the purpose set forth.

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

HENRY E. MOOMAN.

Witnesses:
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D. D. BLAZIER.