(No Model.)

3 Sheets—Sheet 1.

H. A. BIERLEY.

CASH REGISTER.

No. 507,256. Patented Oct. 24, 1893.

FIG. 8.

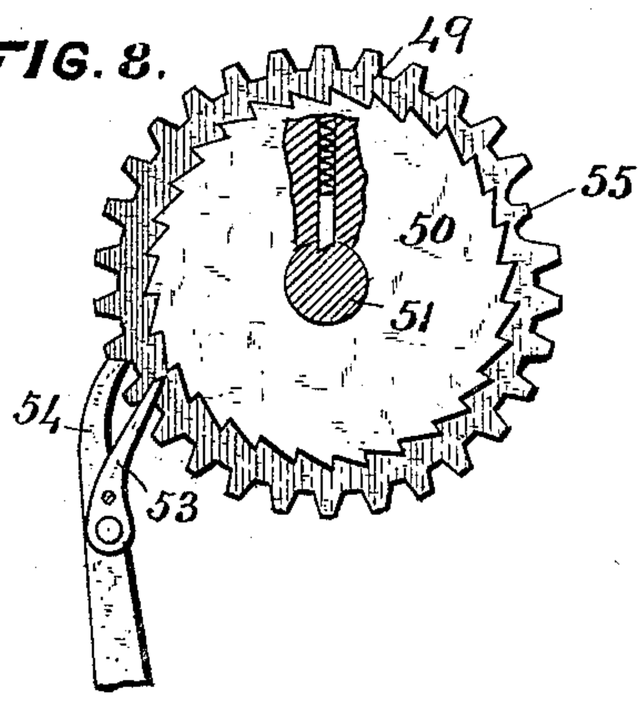


FIG. 9.

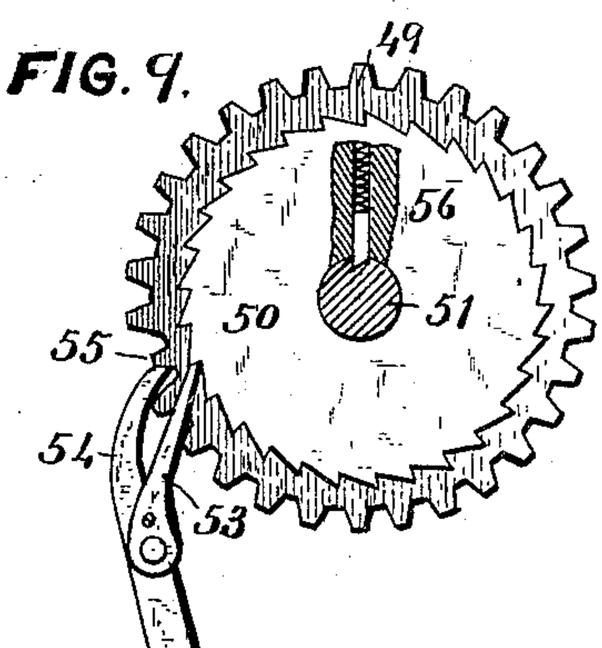
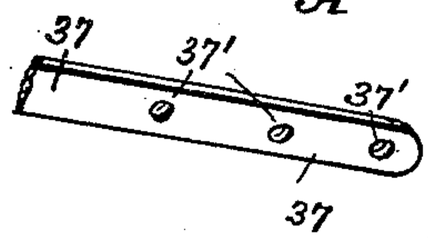


FIG. 1.

FIG. 1a



ATTEST.

J. Henry Kaiser.

C. G. Deming.

INVENTOR.

Henry A. Bierley.

By F. M. Wale

Atty.

(No Model.) 3 Sheets—Sheet 2.

H. A. BIERLEY.

CASH REGISTER.

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FIG. 2.

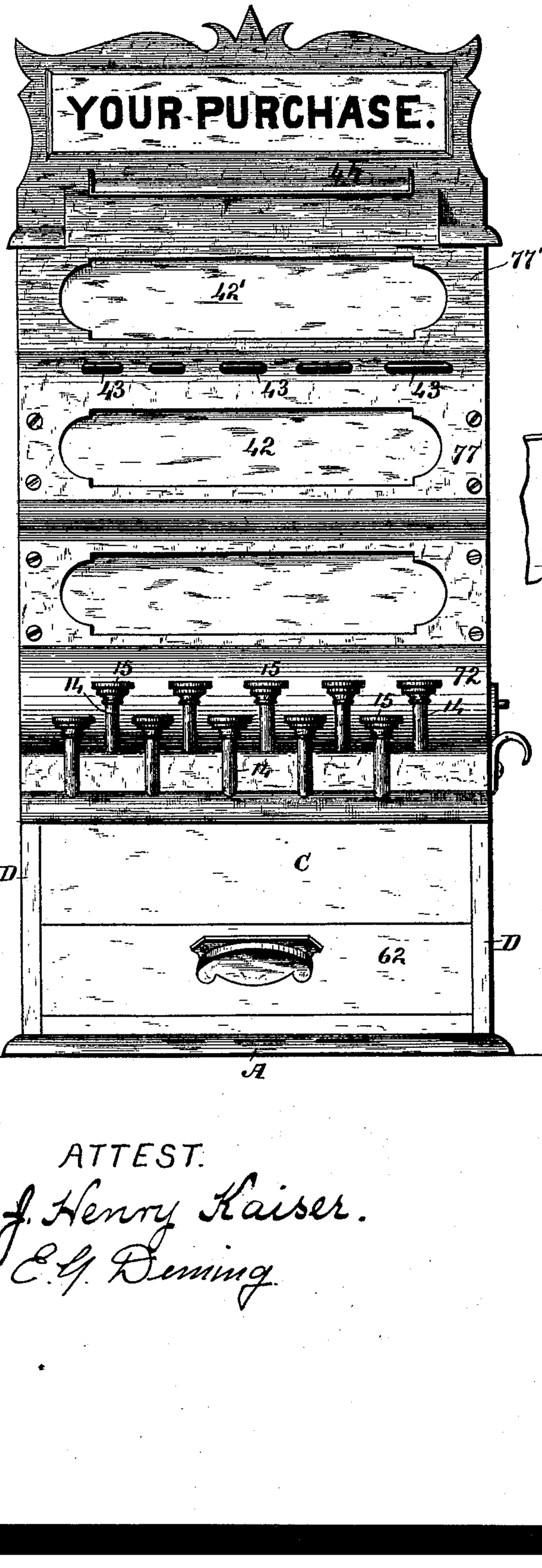


FIG. 3.

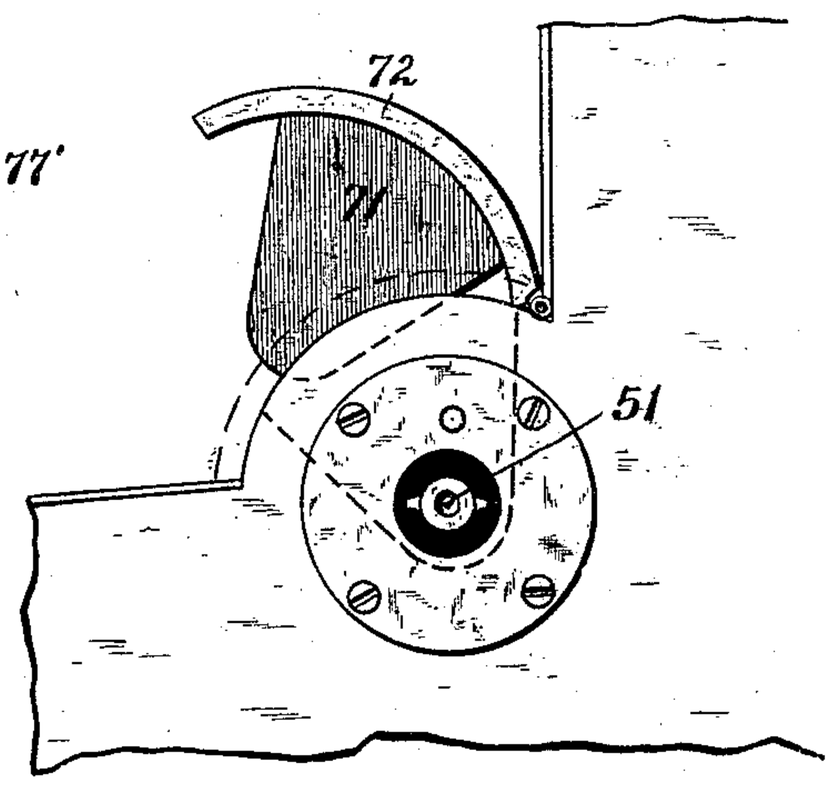


FIG. 4.

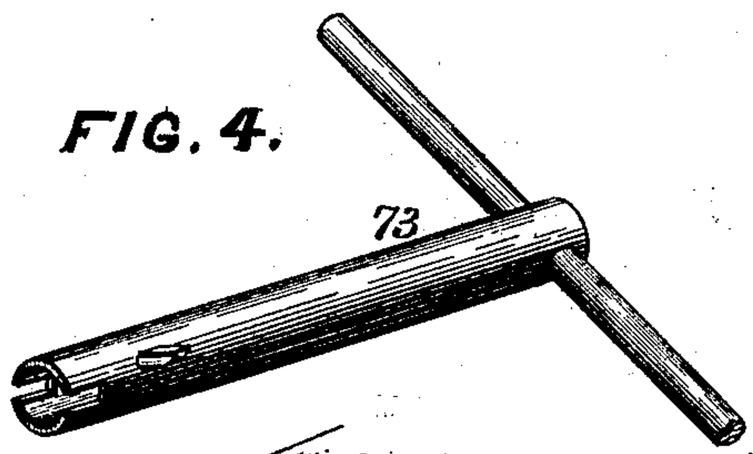
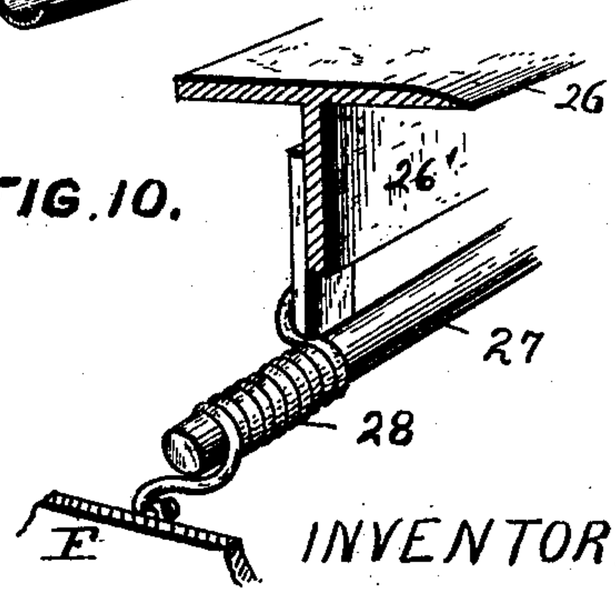


FIG. 10.



ATTEST.

J. Henry Kaiser.

C. G. Deming.

INVENTOR.

Henry A. Bierley.

By "D. M. Wale

Atty.

(No Model.) 3 Sheets—Sheet 3.

H. A. BIERLEY.

CASH REGISTER.

No. 507,256. Patented Oct. 24, 1893.

FIG. 5.

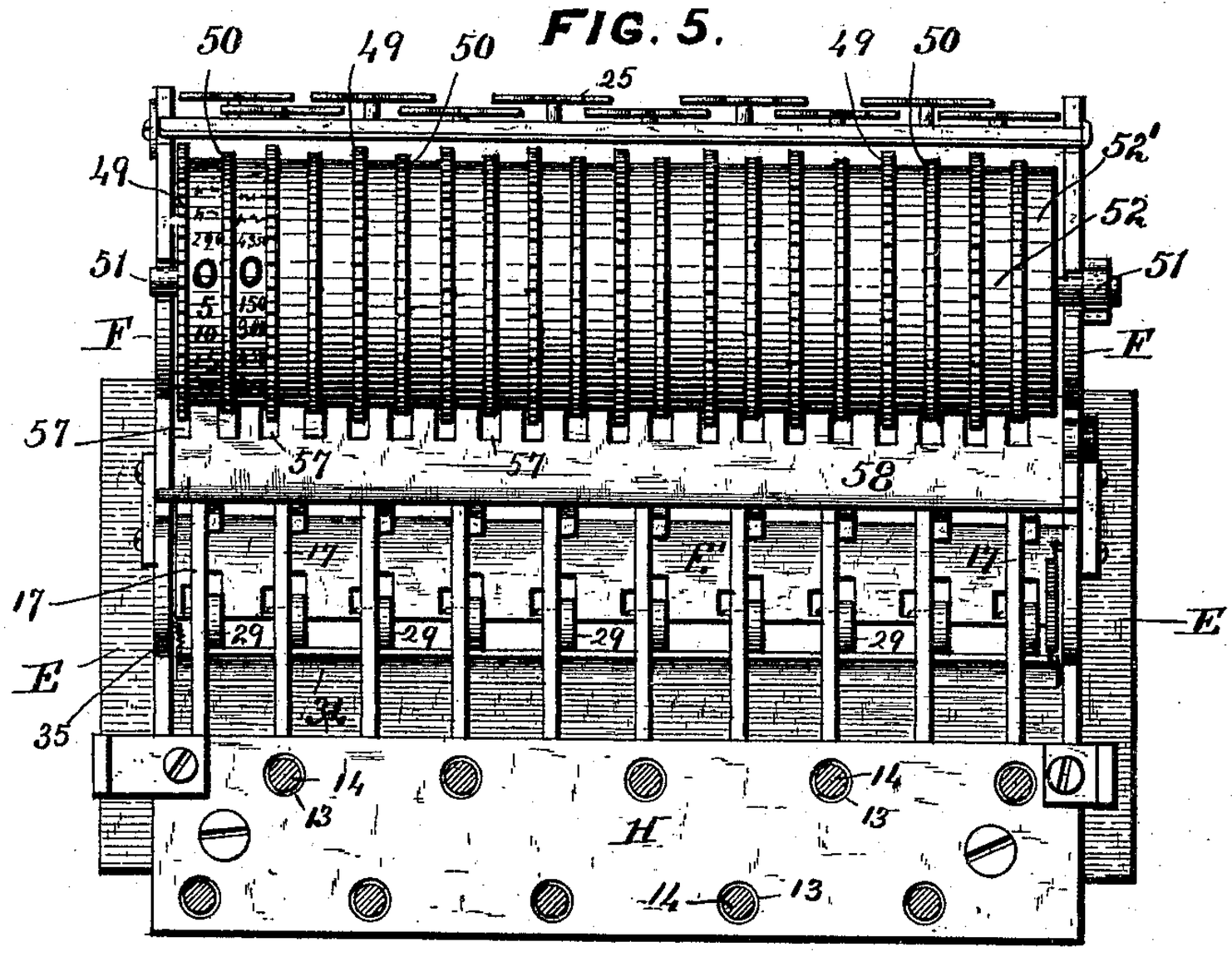


FIG. 6.

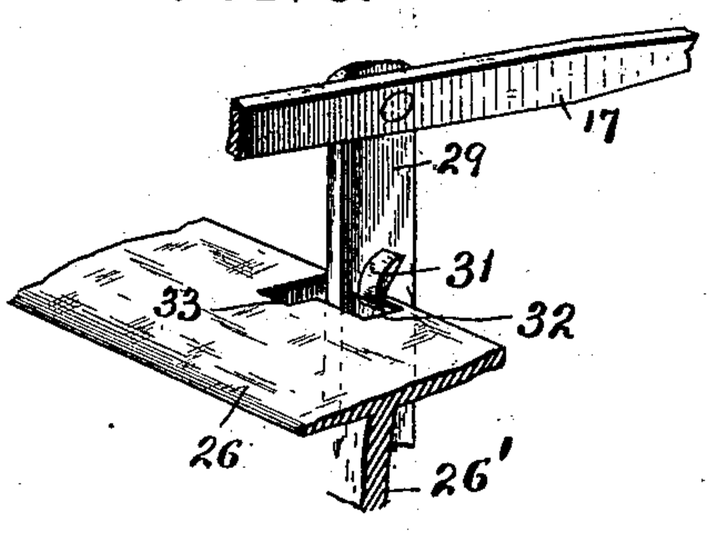
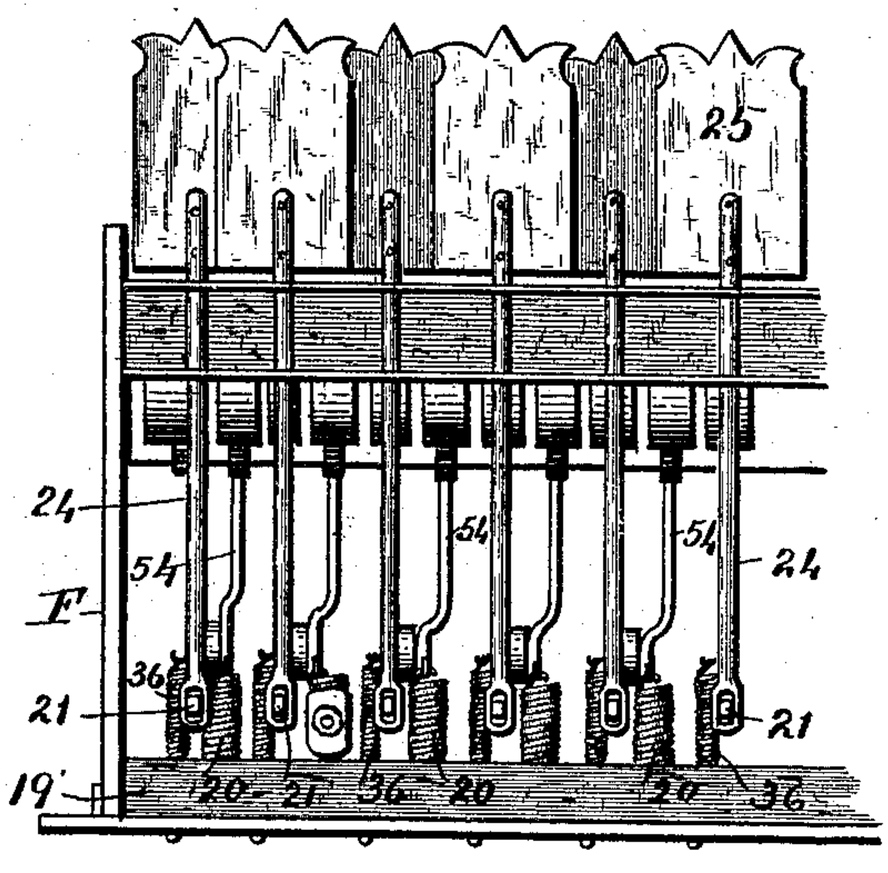


FIG. 7.



ATTEST.

J. Henry Kaiser.

E. G. Deming.

INVENTOR

Henry A. Bierley,

By F. M. Wale

Atty.

UNITED STATES PATENT OFFICE.

HENRY AUGUST BIERLEY, OF LEXINGTON, KENTUCKY, ASSIGNOR TO THE LEADER CASH REGISTER COMPANY, OF SAME PLACE.

CASH-REGISTER.

SPECIFICATION forming part of Letters Patent No. 507,256, dated October 24, 1893.

Application filed July 18, 1892. Serial No. 440.367. (No model.)

To all whom it may concern:

Be it known that I, HENRY AUGUST BIERLEY, a citizen of the United States of America, residing at Lexington, in the county of Fayette and State of Kentucky, have invented certain new and useful Improvements in Cash-Registers, of which the following is a specification, reference being had therein to the accompanying drawings.

The object of my invention is to provide a cash-register and indicator wherein a series of keys are employed each representing a particular number or value so combined and arranged with respect to registering mechanism, a visual signal mechanism, a mechanism for displaying cash received and for depositing all cash received after displaying the same in cash receptacles which may be securely closed against unauthorized persons, an alarm mechanism and mechanism for the release of the change-drawer latch, that when any one of the keys is actuated to its extreme limit it will approximately simultaneously elevate and detain elevated a tablet bearing figures indicating the assigned value of the key actuated, release cash previously deposited upon the cash display plates, operate the registering mechanism, sound the alarm and release the latch holding the change-drawer closed.

My invention consists in the novel constructions, combinations and arrangements of mechanism for effecting my object which will be found fully described and pointed out in the specification and claims.

In the drawings, Figure 1 is a vertical section of my device. Fig. 1ª is a detail of the end of lever 37. Fig. 2 is a front view thereof. Fig. 3 is a detail of the shield normally closing and covering the opening in the outer side casing for the key used in setting the registering wheels. Fig. 4 is a detail of the setting-key. Fig. 5 is a plan view of the registering wheels and their attached mechanism. Fig. 6 is a detail of the mechanism forwardly actuating the visual tablet detent. Fig. 7 is a detail of the rear of my device partly shown, the outer casing removed, and Figs. 8 and 9 are details of the registering wheels and their actuating pawls partly broken away. Fig. 10 is a detail of the torsion spring.

Similar characters of reference indicate the same parts throughout the several views.

The outer case of my device which may be of wood, or partly of wood and partly of metal or other suitable material consists of the bottom A, back B, front of rectangular part of case C, sides D, D, (Figs. 1 and 2.) Above the part C the front outer casing is irregular. Within the outer case and removably attached thereto is the inner case which is preferably of metal and consists of the base plate E, side plates F, F, and cross-brace G, (Figs. 1 and 5.)

The key-rack consisting of the plates H and H′, (Figs. 1 and 5) suitably attached to the base-plate E and side plates F F of the inner case, have the key openings 13 and 13′ to vertically support the keys 14. To afford opportunity for the extreme downward movement of the keys the openings 13″ are provided in the base-plate E. The extension of the keys 14 below rack-plate H and rack-plate H′ may be dispensed with if desired. The keys 14 have the knobs 15 attached to their tops upon which the assigned values of the keys are denoted by suitable numerals.

Projecting forwardly through the openings 16 in the keys 14 to form pivotal attachment therewith, are the front ends of levers 17 so arranged as to play loosely in the openings in the keys prepared for their reception. Levers 17 are pivotally supported upon cylindrical rod 18 suitably attached to side plates F F of the inner casing. The inner ends of levers 17 are pivoted to pawl 54 which are connected by the spiral return springs 20 to bar 19 extending between and secured at its ends to sides F F of the inner casing one end of the spiral springs being attached to the under side of the pawls the opposing end being attached to the bar 19. The spiral return springs operate to return the keys to normal position on being released after being actuated and also to hold the attached pawls in engagement with the registering wheels.

Pivoted upon the cylindrical rod 18 in pairs with levers 17 are the horizontal arms 21 having forwardly projecting catches 22 which engage at their upper edges the stops 23 upon the levers 17 so that the inner end of each

horizontal arm 21 is prevented by the stop 23 upon each lever 17 from normally falling below the point indicated in positive lines in the drawings, Fig. 1, or below the plane of the upper edge of lever 17. The inner ends of arms 21 loosely engage with openings in the lower ends of visual tablet rods 24 to elevate the tablet rods in guides 76 76′. The visual tablet rods carry indicating tablets 25 having characters corresponding with the designated values of the connecting keys, in the manner usual in this class of cash-registers. The visual tablet detent consists of the horizontal plate 26 which is mounted upon the vertical plate 26′, (Figs. 1 and 6.) The supporting plate 26′ is rigidly attached to rock shaft 27 journaled in the sides of the inner casings F F; the vertical supporting plate 26′ and its attached mechanism is held normally rearward from a vertical position by the torsion spring 28 surrounding one end of the rock-shaft 27, the spring being attached at one end to the side plate F and at the opposing end to the vertical plate 26′. Pivotally attached at their upper ends to the levers 17 forward from the pivotal point of the levers upon rod 18, are the vertical depending arms 29 passing downward through openings 30 prepared for their reception in cross-brace G.

Upon the vertical depending arms 29 are cams 31, (Fig. 6) which operate in notches 32 in the rearward part of plate 26 in engagement with the detent plate to actuate it forwardly upon depressing any key, the vertically depending arms 29 playing in slots 33 in plate 26. For the purpose of holding the depending vertical arms 29 in the same relative rearward position I supply the presser 34 pivoted in the sides F of the inner case which is held at its upper edge against the front edges of the depending vertical arms by the spiral spring 35 Fig. 5. The positive return of the visual tablet rods to normal position upon their release from the detent plate 26 is secured by the action of the spiral springs 36 attached to horizontal arms 21 at their upper ends, their opposing ends being attached to bar 19. The operation of this part of my mechanism is as follows: Upon depressing any key its attached lever 17 and depending vertical arm 29 will be carried down, the cam upon the vertically depending arm forwardly actuating detent plate 26 until the downwardly moving cam passes the detent plate and releases it when from the action of torsion spring 28 the detent plate 26 will be rearwardly returned the rear edge of the detent plate engaging with the outer end of catch 22, the detent passing over the catch to support it holding the outer end of arm 21 depressed and its inner end elevated, thus supporting in its elevation corresponding visual tablet 25. Upon actuating any other key the horizontal detent plate 26 will be again forwardly actuated operating to release the visual tablet last elevated, the tablet then in process of elevation by actuating its connected key being in its turn held aloft, which operation is repeated as often as keys are operated. If two or more keys are operated simultaneously their connected tablets will be elevated and so held, thus displaying an amount aggregating more than is indicated upon any one tablet.

Attached to the vertical plate 26′ at its end opposed to that having the attached torsion spring 28, is the long cash diplay plate lever 37, at the inner end whereof is pivoted the long cash display plate rod 38 the upper end of which is pivoted to the inner end of short display plate lever 39 the outer end of the short display plate lever 39 being rigidly attached to cash display plate 40 which is pivoted to the sides D D of the outer case and is held to engage at its lower edge, when normally closed, with the upper edge of the septum 41; openings 37′ are provided at the inner end of the long cash display plate lever 37 for the purpose of adjusting the pivotal point between the lever 37 and rod 38; the cash display plate 40′ is attached to the sides of the outer case and is held normally in engagement at its lower edge with the top of septum 41′ similarly to cash display plate 40 and is actuated with cash display plate 40 by means of the short connecting rod 38′ and the short attached display plate lever 39′. Immediately in front of cash display plates 40 and 40′ are the glazed openings 42 42′ for the inspection of money or substances lodged upon the cash display plates. The glasses 42 42′ and front cross-braces 77 77′ which together form the front outer casing of this part of my register, constitute the outer walls of angular chambers 45 45′ the display plates when closed forming the inner walls thereof, into which all cash received for sales is intended to be deposited, the paper money through opening 44 and coin through openings 43 in the outer case. The cash receptacle K may be locked against access by unauthorized persons.

The cash receptacle has the partition 46 dividing the receptacle into coin-box 47 and paper money box, 48. The septum 41, secured to the outer side casings, leads to the coin-box 47 and the septum 41′ similarly secured, leads to the paper money box 48. The operation of this part of my device is as follows: Upon forwardly actuating the vertical plate 26′ by depressing any key as heretofore described, the attached long cash display plate lever 37 will be elevated at its inner end carrying with it the long cash display plate rod 38 and the outer end of the short display plate lever 39 which movement will cause cash display plate 40 to be disengaged at its lower edge from the top of septum 41 thus releasing the coin or other material there held which will be deposited by gravity in the coin-box 47. By its described connections display plate 40′ will be similarly actuated with a like result as to its withheld paper money or other material,

except that the septum 41′ will lead the withheld substance to paper money box 48.

The registering portion of my device with its actuating mechanism consists of cog-wheel 49 and ratchet-wheel 50 loosely mounted in pairs upon shaft 51. For convenience in operation the cog-wheel 49 and ratchet wheel 50 are respectively supplied with thirty cogs and ratchets; this number may be varied at pleasure but if varied a proportionately different result will be attained from that hereinafter described.

Attached to each of the registering wheels 49 and 50 are the flanges 52 52′. The flange 52 has upon its face multiples of the expressed value of its actuating key; thus if five cents be the expressed value of the actuating key the flange 52 will bear opposite each cog in their order respectively the numbers 5, 10, 15 and so on up to 145, the last cog or thirtieth, representing 150 or 0 (zero) the completed revolution of registering-wheel 49 being recorded by actuating ratchet-wheel 50 the space of one of its ratchets by the spur 53 on pawl 54, the thirtieth cog 55 on registering wheel 49 being sunken so as to bring spur 53 in contact with the ratchets on ratchet wheel 50 when pawl 54 engages with the sunken cog 55 thus actuating the ratchet wheel 50 the space of one of its ratchets on each revolution of cog-wheel 49 and indicating at each impulse thirty times the value of the actuating key. The figures therefore upon flange 52′ will be 150, 300, 450 and so on up to 4,350 in progressive order, the naught or zero upon this flange representing if passed 4,500. This explanation of one pair of registering wheels will serve to illustrate all. The pawls 54 operate in guide slots 57 in cross-brace 58 suitably attached to the sides F of the inner case.

For the purpose of setting the registering wheels I provide the spring latch 56 located in the registering wheels which catch shaft 51 in groove 51′, when the shaft is rotated in the direction of the registering wheels when actuated by the pawls. The shaft 51 is arranged to be turned in the direction indicated by the setting key 73. The spring latches are located in the registering wheels under the zero mark. It is plain that as the wheels are caught in turning the shaft they will all be brought in line upon the zero mark.

For the purpose of preventing any but authorized persons from actuating the registering wheels to set them or change them when set, I supply the shield 71 attached to hinged front 72. When the hinged front 72 is normally closed the shield covers the end of shaft 51 prepared for the reception of the setting-key 73, as shown in dotted lines, Fig. 3, and prevents the insertion of the setting key, Fig. 4. To operate the shaft 51 to set the registering wheels the hinged front 72 must therefore be raised as indicated in positive lines in Fig. 3. It is plain that the hinged front may be locked against unauthorized persons. The registering wheels may be inspected at any time by raising the hinged front 72, through openings in the sheath 75 which rest upon and is attached to cross-brace 58 and covers the registering wheels, to protect them.

Except as to setting which has already been described, the operation of my registering mechanism is as follows: Upon depressing any key, or simultaneously more than one key to represent the aggregate amount of a sale, the corresponding lever 17 is actuated upwardly at its inner end carrying with it pawl 54 moving the registering wheels in engagement with pawl 54 and its spur 53 the space of one cog or ratchet. When it is desirable to ascertain the number of times any key has been actuated, an inspection of the registering wheels in pairs will disclose the same, wheel 50 showing the number of complete revolutions up to thirty, of wheel 49 and the latter wheel showing how often it has been actuated to partly complete a revolution. The number of complete revolutions taken as many times as there are cogs actuated in wheel 49 plus the number of cogs actuated in wheel 49 in partial revolution will yield the number of cogs actuated which taken as many times as is indicated by the assigned value of the corresponding key will give a total of the assigned value of the combined times the key and corresponding registering wheels have been operated; or if the numbers be placed upon the registering wheels as heretofore indicated the indicated number upon the two wheels will give the total assigned values; thus, taking the five cent key as an example if there are indicated two full revolutions of cog-wheel 49, ratchet-wheel 50 will indicate 300; if cog-wheel 49 has been actuated twelve times in partial revolution the number 60 will be indicated thereon; taken together the pair of registering-wheels will indicate sales to the amount of $3.60.

My alarm mechanism consists of the gong 59, shown in dotted lines in Fig. 1 and the clapper 60 located upon the inner end of clapper rod 61, which is attached at its outer end to the vertical plate 26′ and moves therewith. The clapper is raised from the gong by the action of the heretofore described mechanism for actuating vertical plate 26′ and when the plate is released the tension of the torsion spring 28 will cause the clapper to strike the gong and sound the alarm.

My mechanism for unlatching the change drawer 62 consists of the unlatching lever 63 attached at its outer end to vertical plate 26′ and actuated thereby as heretofore explained; the latch lever 64 pivoted at 65 having upon its inner end the latch 66 which engages with catch 67 in the rear part of the change drawer when the change drawer is closed. By actuating vertical plate 26′ as heretofore described the outer arm of latch lever 64 is elevated by engaging with unlatching lever 63, depressing the inner arm thereof, thus releasing the

latch 64 from catch 67. Upon releasing the engagement of the latch 66 with catch 67 the change drawer is pressed open by the resiliency of spiral springs 68 which surrounds rod 69 prepared for its reception and against which the rear downwardly projecting part of the change drawer through which rod 69 passes, presses when the drawer is closed. The spiral spring 70 located at the opposing end of rod 69 from spiral spring 68, serves as a buffer for the change drawer receiving the concussion of the downwardly projecting rear part of the change drawer when the drawer is forced open as heretofore described. Among the advantages of my cash register as herein described is that of rendering it possible for an authorized person to have a positive check, within wide limits, upon the person operating the cash register. It will be readily understood that at the close of business, or at the time of calling the operator of the cash register to an account that if the business has been irregularly conducted and the cash register operated at each sale and receipt of cash therefor the total amount of cash in the cash receptacle will balance the amount of registered sales plus the disbursed change from the change drawer. The amount of disbursed change must be the difference between the amount of change in the change drawer at time of inspection and the amount therein on commencing business. Thus let it be assumed that the amount of sales registered have been $3.60 as heretofore set forth; that $6.00 appear in the cash receptacle; that at the beginning of business $4.00 were on deposit in the change drawer. Now upon inspection there should be in the change drawer, undisbursed $1.60. The authorized inspector finding there $1.60 will deduct this sum from the change ($4.00) deposited therein on commencing business leaving $2.40 disbursed in change. He will add this sum to the amount of sales as disclosed by the registering wheels, $3.60, producing the sum of $6.00, the amount found in the cash receptacle, showing regularity and accuracy in conducting the business. But a variation from this condition of affairs will disclose an irregularity.

Portions of my cash register have been heretofore described in United States patents granted to me bearing No. 462,615, dated November 3, 1891, and No. 473,723, bearing date April 26, 1892.

Having thus described my invention I claim—

1. In a cash register in combination a cash display-plate pivoted in the sides of the casing having its lower edge normally in engagement with the upper edge of a septum, forming when closed the rear wall of the angular chamber, and the front casing connected with the upper edge of the septum forming the front wall of the angular chamber, substantially as described.

2. In a cash-register in combination a cash display-plate pivoted in the sides of the casing having its lower edge normally in engagement with the upper edge of a septum forming when closed the rear wall of the angular chamber, the front casing connected with the upper edge of the septum forming the front wall of the angular chamber and slots in the wall of the casing for the admission of coin and paper money at the upper part of the chamber, substantially as set forth.

3. In a cash register in combination a cash display plate pivoted in the sides of the casing having its lower edge normally in engagement with the upper edge of a septum forming when closed the rear wall of the angular chamber, the front casing connected with the upper edge of the septum forming the front wall of the angular chamber, slots in the casing for the admission of coin or paper money to the chamber, a lever rigidly attached at its outer end to the display plate and connected at its inner end with mechanism to actuate the display plate to release the cash contained within the chamber, substantially as set forth.

4. In a cash register in combination a cash display plate pivoted in the sides of the casing having its lower edge normally in engagement with the upper edge of a septum forming when closed the rear wall of the angular chamber, the front casing connected with the upper edge of the septum forming the front wall of the angular chamber, a lever rigidly attached at its outer end to the display plate and connected at its inner end with mechanism to actuate the display plate to release the cash contained within the chamber and a septum leading to a cash receptacle, substantially as set forth.

5. In a cash register in combination a cash display plate pivoted in the sides of the casing having its lower edge normally in engagement with the upper edge of a septum forming when closed the rear wall of the angular chamber, the front casing connected with the upper edge of the septum forming the front wall of the angular chamber, a lever rigidly attached at its outer end to the display plate and connected at its inner end with mechanism to actuate the display plate to release the cash contained within the chamber, a septum leading to a cash receptacle and a cash receptacle, substantially as set forth.

6. In a cash register in combination a cash display plate pivoted in the sides of the casing having its lower edge normally in engagement with the upper edge of a septum forming when closed the rear wall of the angular chamber, the front casing connected with the upper edge of the septum forming the front wall of an angular chamber, slots in the casing for the admission of coin or paper money to the chamber, a lever attached at its outer end to the display plate, a vertical rod pivotally attached at its upper end to the inner end of the display plate lever, a hori-

zontal lever attached at its outer end to an oscillating vertical plate the inner end of the horizontal lever and lower end of the vertical rod being pivotally attached, a rock shaft journaled in the side casings carrying the vertical plate, a torsion spring attached at one end to the vertical plate, its opposing end being attached to the side casing, a horizontal detent plate mounted upon the vertical plate, depending arms carrying cams operating in notches in the horizontal detent plate, levers supporting the depending arms pivotally connected at their outer ends with keys and at their inner ends fulcrumed upon a transverse rod secured in the side casings and the transverse rod supporting the inner ends of the levers, substantially as set forth.

7. In a cash register in combination a cash display plate pivoted in the sides of the casing, a lever attached at its outer end to the display plate, a vertical rod pivotally attached at its upper end to the inner end of the display plate lever, a horizontal lever attached at its outer end to an oscillating vertical plate the inner end of the horizontal lever and the lower end of the vertical rod being pivotally attached, a rock shaft journaled in the side casings carrying the vertical plate, a torsion spring attached at one end to the vertical plate its opposing end being attached to the side casing, a horizontal detent plate mounted upon the vertical plate, depending arms carrying cams operating in notches in the horizontal detent plate, levers supporting the depending arms pivotally connected at their outer ends with keys and at their inner ends fulcrumed upon a transverse rod secured in the side casings and actuating keys, substantially as set forth.

8. In a cash register in combination actuating keys, levers supporting depending arms connecting with and pivoted at their outer ends to the actuating keys their inner ends fulcrumed upon a transverse rod secured in the side casings, the transverse rod supporting the levers at their inner ends, depending arms carrying cams operating in notches in the horizontal detent plate, the horizontal detent plate mounted upon a vertical plate, the vertical plate carrying the horizontal detent plate and rigidly attached to a rock shaft journaled in the side casings, the rock shaft journaled in the side casings, the torsion spring attached at one end to the vertical plate its opposing end being attached to the side casing, the horizontal arms pivoted upon the transverse rod and having forwardly projecting catches to engage at their upper edges stops upon the levers and to further engage at their outer ends the horizontal detent plate, visual tablet rods having their lower ends pivoted to the inner ends of the horizontal arms and visual tablets, substantially as described.

9. In a cash register in combination actuating keys, levers supporting depending arms connecting with and pivoted at their outer ends to the actuating keys their inner ends fulcrumed upon a transverse rod secured in the side casings, the transverse rod supporting the levers at their inner ends, depending arms carrying cams operating in notches in the horizontal detent plate, the horizontal detent plate mounted upon the vertical plate, the vertical plate carrying the horizontal detent plate and rigidly attached to a rock shaft journaled in the side casings, the rock-shaft, the torsion spring attached at one end to the vertical plate its opposing end being attached to the side casing, the clapper rod attached at its outer end to the vertical plate the bell clapper and the gong, substantially as set forth.

10. In a cash register in combination actuating keys, levers supporting depending arms connecting with and pivoted at their outer ends to the actuating keys their inner ends fulcrumed upon a transverse rod secured in the side casings, the transverse rod supporting the levers at their inner ends, depending arms carrying cams operating in notches in the horizontal detent plate, the horizontal detent plate mounted upon the vertical plate, the vertical plate carrying the horizontal detent plate and rigidly attached to the rock shaft, the rock shaft, the torsion spring attached at one end of the side casing its opposing end being attached to the vertical plate, the unlatching lever attached at its outer end to the vertical plate, the latch lever pivoted in the side casings, having a latch upon its inner end and the catch upon the inner end of the change drawer to engage the latch, substantially as and for the purposes set forth.

11. In a cash register in combination actuating keys, levers connecting with and pivoted at their outer ends to the actuating keys their inner ends fulcrumed upon a transverse rod secured to the side casings, pawls pivotally attached to the levers inwardly from their fulcrum bearings spiral springs having one end attached to the pawls and the opposing end attached to a transverse bar secured at its ends to the side casings, the pawls, having spurs attached by set screws, and the registering wheels arranged to be operated by engagement with the pawls, substantially as described.

12. In a cash register in combination the shield rigidly attached to one end of the outer hinged covering over the registering wheels operating to close the key opening used to insert the key for setting the registering wheels, the shaft carrying the registering wheels having at one end a spline for the reception of the setting-key, substantially as and for the purposes specified.

13. In a cash register in combination the herein described vertical plate mounted upon a rock-shaft and susceptible of being actuated rearwardly by a torsion spring and for-

wardly by a cam attached to a depending arm connected with a key, the horizontal lever for actuating the display plate rod, the clapper rod and the unlatching lever, substantially as described.

14. In a cash register in combination with actuating keys the herein described horizontal plate mounted upon a vertical plate attached to a rock-shaft and susceptible of being actuated rearwardly by a torsion spring and forwardly by a cam attached to a depending arm connected with a key, a supporting vertical plate, a rock-shaft attached to the vertical plate and an actuating torsion spring substantially as described.

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

HENRY AUGUST BIERLEY.

Witnesses:
M. C. ALFORD,
F. B. SCEANE.