

J. F. PIXLEY & LE GRAND C. BUSH.

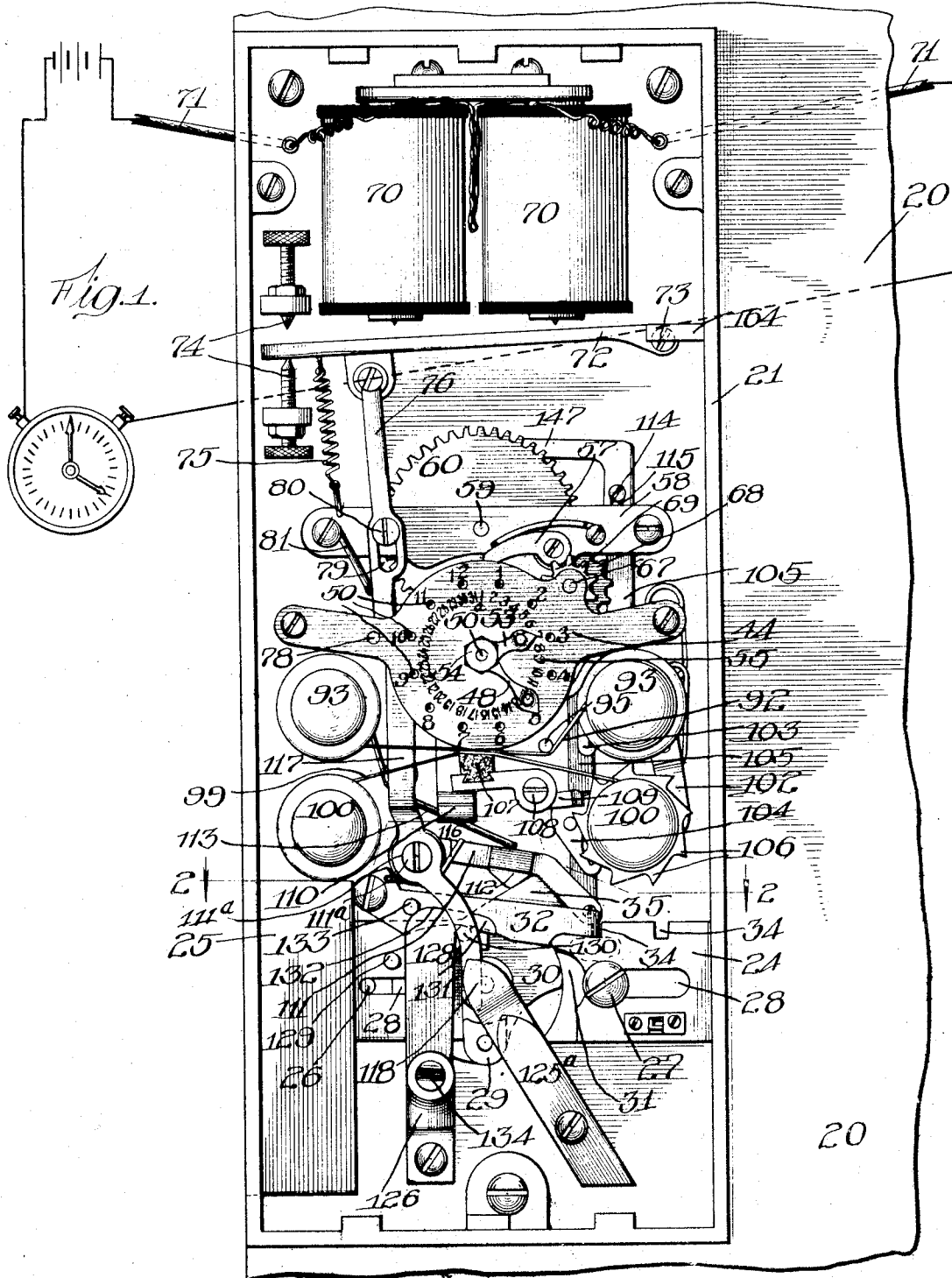
RECORDING TIME LOCK.

APPLICATION FILED SEPT. 18, 1906.

947,475.

Patented Jan. 25, 1910.

4 SHEETS—SHEET 1.



Witnesses:
J. V. Dumas.
J. N. Jochem, Jr.
 Inventor:
Le Grand C. Bush
John F. Pixley
 by *Brown, Barclay & Co. Attys.*

J. F. PIXLEY & LE GRAND C. BUSH.

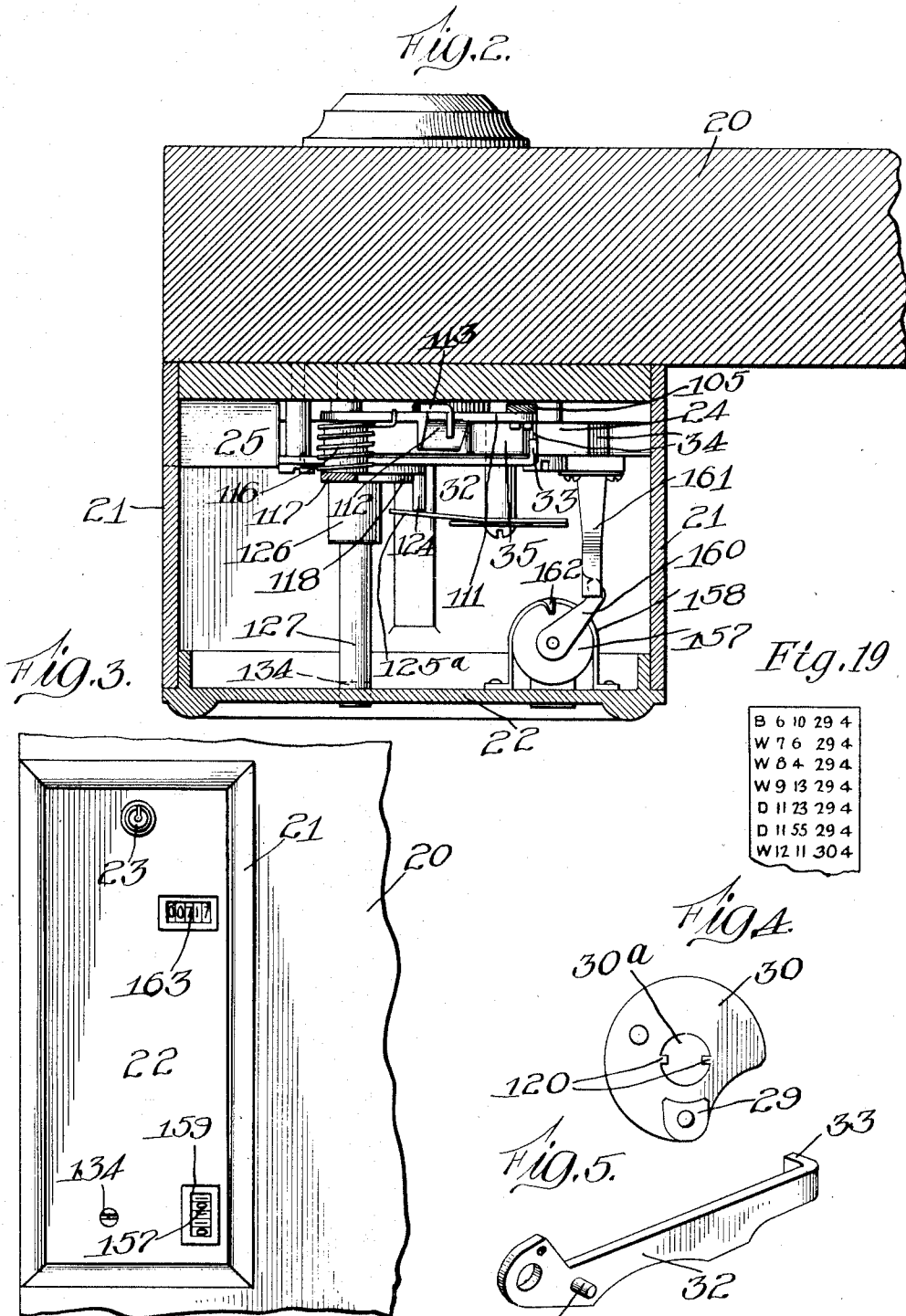
RECORDING TIME LOCK.

APPLICATION FILED SEPT. 18, 1906.

947,475.

Patented Jan. 25, 1910.

4 SHEETS—SHEET 2.



Witnesses:

W. V. Domarus.
J. H. Jochum, Jr.

Inventor:

John F. Pixley
Le Grand C. Bush
by Brown & Lehigh & Hopkins attys

J. F. PIXLEY & LE GRAND C. BUSH.

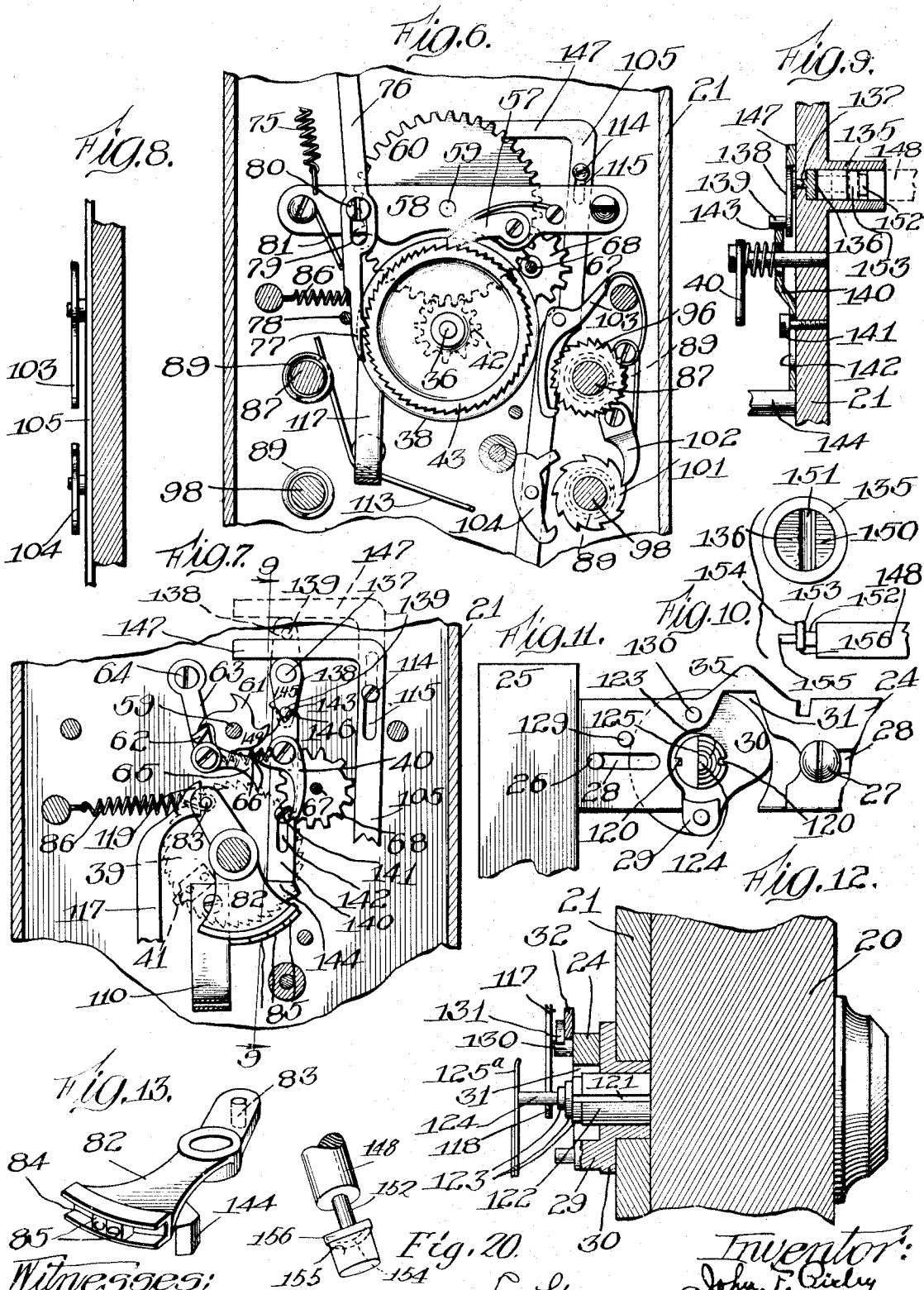
RECORDING TIME LOCK.

APPLICATION FILED SEPT. 18, 1906.

947,475.

Patented Jan. 25, 1910.

4 SHEETS—SHEET 3.



Witnesses:
W. V. Donahue
J. H. Jochims, Jr.

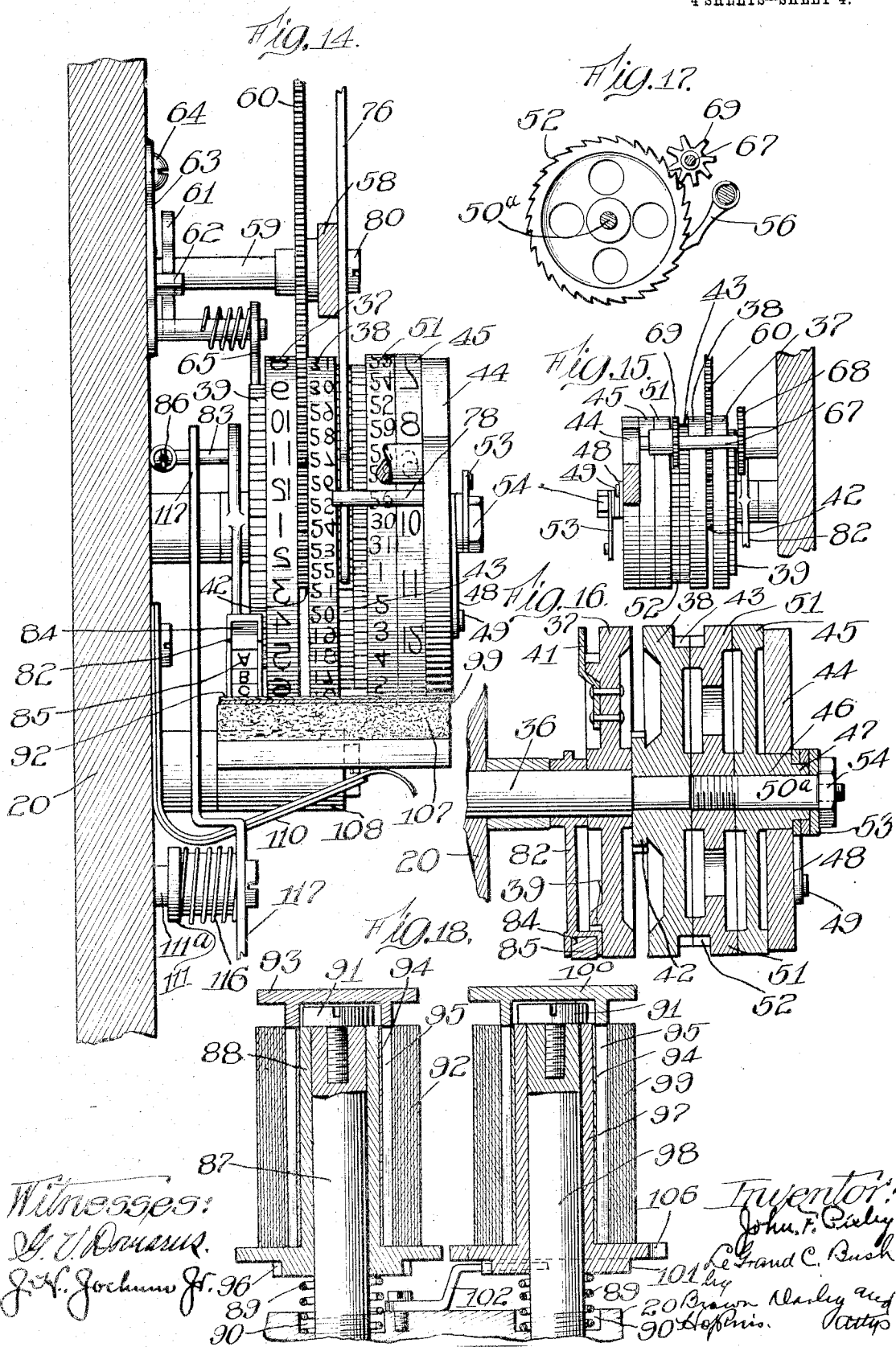
Inventor:
John F. Pixley
Le Grand C. Bush
 by *Brown, Warley & Hopkins*

RECORDING TIME LOCK.

APPLICATION FILED SEPT. 18, 1906.

Patented Jan. 25, 1910.

4 SHEETS—SHEET 4.



UNITED STATES PATENT OFFICE.

JOHN F. PIXLEY, OF COLUMBUS, OHIO, AND LE GRAND C. BUSH, OF CHICAGO, ILLINOIS;
SAID BUSH ASSIGNOR TO CLARENCE H. PUMPHREY, OF CHICAGO, ILLINOIS.

RECORDING TIME-LOCK.

947,475.

Specification of Letters Patent. Patented Jan. 25, 1910.

Application filed September 18, 1906. Serial No. 335,096.

To all whom it may concern:

Be it known that we, JOHN F. PIXLEY and LE GRAND C. BUSH, citizens of the United States, residing, respectively, at Columbus, in the county of Franklin and State of Ohio, and Chicago, Cook county, Illinois, have invented certain new and useful Improvements in Recording Time-Locks, of which the following is a full, clear, and exact specification.

This invention relates to improvements in time locks adapted to be operated by any one of a series of keys, and the primary object of the same is to provide an improved device of this character which will record the exact time when the operation was effected, and also designate the particular key employed.

A further object is to provide an improved lock of this character which is adapted to record more often than heretofore, wherein the mechanism depended for its operation directly upon the clock mechanism.

A further object is to provide an improved lock of this character wherein the clock may be placed away from the door or closure to which the lock is applied, to prevent the same from being injured by jarring or otherwise, due to opening and closing the closure.

A further object is to provide an improved lock of this character, whereby a striking action or blow will be imparted to the printing platen, as distinguished from a pressing action.

A further object is to provide improved mechanism for locking or holding the recording mechanism out of operative position to permit the bolt to be moved without making an impression or record.

To the attainment of these ends and the accomplishment of other new and useful objects as will appear, the invention consists in the features of novelty in the construction, combination and arrangement of the several parts hereinafter more fully described and claimed, and shown in the accompanying drawings illustrating an exemplification of the invention, and in which,—

Figure 1 is a front elevation of a lock constructed in accordance with the principles of this invention; Fig. 2 is a sectional view on line 2—2 of Fig. 1; Fig. 3 is an elevation of the face plate of the lock; Fig. 4 is an elevation of the main tumbler for the lock; Fig. 5 is a perspective view of the locking

member for the bolt; Fig. 6 is an elevation of a portion of the recording operating mechanism; Fig. 7 is a view similar to Fig. 6, with some of the parts removed; Fig. 8 is a detail view of a portion of the arm or member and parts for operating the ribbon and record-holding spools; Fig. 9 is a sectional view on line 9—9 of Fig. 7; Fig. 10 is a detail view of a portion of an operating key and the barrel therefor; Fig. 11 is an elevation of a portion of the bolt and the operating tumbler; Fig. 12 is a detail view of the differentiated operating tumbler; Fig. 13 is a perspective view of the individual indicator segment; Fig. 14 is a side elevation of the time and date wheels, the indicator segment and the printing platen; Fig. 15 is an elevation of the opposite side of the time and date wheels; Fig. 16 is a longitudinal sectional view through the various indicator wheels; Fig. 17 is a detail view of the ratchet and carrying mechanism for the minute wheel; and Fig. 18 is a longitudinal sectional view of the inking ribbon and paper-carrying reels. Fig. 19 shows a portion of the record tape. Fig. 20 is a detail perspective view of one end of the watchman's key.

Referring more particularly to the drawings, the same reference numerals designate similar parts throughout the several views.

In this exemplification of the invention, the lock is shown applied to a door 20, and comprises a rectangular casing 21, preferably open at its front, and is adapted to be closed by a cover 22, which latter is provided with a suitable fastening device such as a lock 23.

A locking bolt 24, preferably provided with an enlarged end 25, is mounted for sliding movement within the casing adjacent the lower end thereof, the enlarged portion 25 being adapted to pass through one side of the casing. This bolt is preferably guided and removably secured in position by means of a projection or lug 26 on the casing, and a bolt or screw 27 passing through suitable apertures or slots 28 in the body of the bolt. This bolt is adapted to be moved backward and forward by means of a projection 29 extending from the face of an operating tumbler or cam 30, which latter is rotatably mounted in the casing 21. When the tumbler or cam 30 is rotated, the projection 29 moves in a suitable slot or cut-

away portion 31 in the bolt 24, in the ordinary manner.

Pivotaly mounted within the casing is a locking dog or tumbler 32, the end of which is offset laterally as at 33. This offset portion 33 is adapted to enter and rest in suitable notches 34 in the bolt 24, to hold said bolt in either of its positions, and is adapted to be raised by the projection 29 on the tumbler 30 when the latter is rotated in a manner to be set forth. Projecting above the top of the bolt 24 is a cam-shaped or tapered portion 35, for a purpose to be set forth.

A stud or post 36 is located at substantially the center of the casing 21, at a suitable distance above the bolt 24, and rotatably mounted for independent rotation thereon is an hour wheel 37 and a minute wheel 38. The hour disk or wheel 37 is provided with the numerals 1 to 12 arranged around its periphery, and projecting from the rear face thereof are ratchet teeth 39, which are engaged by a spring-controlled retaining-pawl 40, supported by the casing, and which is adapted to prevent retrograde movement of the disk or wheel 37. Secured also to the rear face of the disk or wheel is a finger or projection 41, which extends beyond the periphery of the ratchet teeth 39 and substantially flush with the periphery of the body of the disk or wheel, for a purpose to be set forth.

The minute wheel 38 is spaced from the hour wheel by means of a gear 42; adjacent the center of the wheel and projecting from the opposite face thereof is a ratchet 43 similar to the ratchet 39. A suitable support, preferably comprising a plate 44, is spaced from and supported by the casing 21, in proximity to the hour and minute wheels 37-38, and a month wheel 45 is rotatably supported by this plate by means of its hub 46 passing therethrough and being journaled therein. The extremity 47 of the hub is reduced and extends beyond the face of the plate; and secured to the reduced portion adjacent the outer face of the plate, and in a manner to prevent independent rotation, is a hand or pointer 48, which is preferably provided with a lug or projection 49 adapted to enter any one of the sockets 50 arranged on the plate 44 in the path of movement of said projection. These sockets are preferably numbered to represent the different months, and correspond with similar numerals on the periphery of the month wheel 45, and are so arranged that when the projection 49 is resting in the socket designating the desired month, the corresponding number on the wheel 45 will be in operative position.

Passing loosely through the hub 46 of the wheel 45 is an arbor 50^a, to the end of

which is secured a day wheel 51 having the numbers of the days arranged around the periphery thereof in a manner similar to the other wheels. One face of this wheel rests against the exposed face of the wheel 45, while the other face is provided with a ratchet 52. The other end of the arbor 50 projects beyond the face of the plate 44, and secured thereto is a hand or pointer 53, and said hand or pointer 53 and the wheel 51 are prevented from displacement by means of a nut 54. The hand or pointer 53 is adapted to move over the face of the plate 44 and adjacent a series of numerals 55 designating the days of the month and corresponding to the numerals arranged around the periphery of the wheel 51, so that when the pointer designates a certain day, the corresponding day on the wheel 51 will be in operative position similar to the wheel 45.

The projection 49 on the handle or pointer 48 will hold the month wheel 45 against retrograde movement, while the day wheel 51 is held by means of a suitable retaining pawl 56 supported by the casing 21, and engaging the ratchet 52 on the wheel.

The wheels 37-38-51-45 are preferably of the same size and are arranged in a direct alinement with each other. The minute wheel 38 is prevented from retrograde movement, preferably, by means of a spring-controlled pawl or dog 57 pivoted to a suitable support 58, and which engages the ratchet 43 on said wheel.

Secured to a shaft 59, one end of which is journaled in the casing 21 and the other in the support 58, is a gear wheel 60 which is adapted to extend into the space between the hour and minute wheels 37-38 and mesh with the gear 42 on the minute wheel 38. Secured also to this shaft 59 is a tappet or spur wheel 61, the arms of which are adapted to engage a projection 62 on a swinging arm 63, one end of which is pivoted, as at 64, to the casing 21, and pivotally connected to the free end thereof is a spring-controlled dog or pawl 65, which also rests upon and engages the ratchet 39 of the hour wheel 37. A spring 66 is secured by one end to the arm 63, and the other end is secured to any suitable support, and tends to hold the arm 63 and dog or pawl 65 forward in the position shown in Fig. 7. A similar shaft 67 is arranged adjacent the peripheries of the recorder wheels, one end of which is journaled in the casing 21 and the other in the plate 44. Secured to this shaft 67 is a spur or pinion wheel 68, which is so arranged as to be engaged and rotated by the projection 41 on the wheel 37, once for every complete rotation of the wheel 37, to move or rotate the shaft 67 one step. A pinion wheel 69 is also secured to the shaft 67, and is arranged to engage and mesh with the ratchet 52 on the day wheel 51.

Within the casing 21, preferably adjacent the top thereof, are coils 70, leading from which are suitable conductors 71. These coils are energized from any suitable source of supply (not shown), and one of the conductors may be connected to the arbor of the hands of a clock, and the other to suitable contact points on the clock dial, preferably arranged one adjacent each minute mark, which are adapted to be engaged by the minute hand for completing the circuit to energize the coils 70 in the ordinary and well known manner, to attract an armature 72. The mechanism for completing the circuit, forming no part of this invention, is not illustrated. The armature 72 is preferably pivoted to the support 73 by one end; the other end moves between the adjusting screws 74, and said armature is normally held out of engagement with the coils 70, by means of a suitable spring 75, one end of which is preferably secured to the armature and the other to the support 58.

Pivotaly connected to the armature by one end, is an arm or operating pawl 76, the extremity 77 of which rests upon and engages the ratchet 43 of the minute wheel 38, and is prevented from displacement in any suitable manner, such as by means of a lug or projection 78 standing behind the extremity 77 thereof and extending from the plate 44. This arm or pawl may be provided with a slot 79, through which a suitable screw or bolt 80 passes, and which engages the support 58 to form a guide therefor. A suitable spring 81 may be arranged to engage the arm or dog 76 for yieldingly holding the extremity 77 in engagement with the ratchet 43.

Pivotaly mounted upon the stud or post 36, preferably intermediate its ends, and adjacent the hour wheel 37, is a segment 82, which is provided adjacent one end with a lateral projecting pin or lug 83; the periphery of the free end being grooved or recessed, as at 84, for the reception of type 85 which indicate or designate the particular key used to operate the lock, in a manner to be set forth. The faces of these type are so arranged as to be flush with the faces of the numerals on the peripheries of the various wheels. A suitable spring 86, having one of its ends secured to the lug or projection 83 and the other to the casing 21, is provided, and tends to hold the segment in its proper position and to return the same to its normal position when the operating key has been removed, as will be set forth.

Projecting from the casing 20, on each side of and in close proximity to the recorder wheels, are posts 87 upon which are rotatably supported inking-ribbon spools 88. Beneath each of these spools is a spring 89, one end of which is preferably seated in a socket 90 in the casing 20, and the other end bears

against the lower face of the spool 88. These springs tend to hold the spools away from the base of the casing, and the tension thereof is adjusted by means of a screw or bolt 91 engaging the posts 87, and with the heads thereof resting against the tops of the spools to create the desired friction upon the spools and prevent them from rotating too rapidly. An inking ribbon 92 passes from one of the spools 87 to the opposite spool, and the ends thereof are secured to the respective spools in any desired manner, preferably by means of a cap 93 adapted to cover the spools, and which is provided with ribs 94 entering grooves 95 in the spools. The ends of the ribbon are placed against the spools and the cap 93 slipped on, the ribs 94 forcing the ribbon into the groove and securely holding the same. The ribbon 92, in extending across from one spool to the other, stands adjacent the periphery of the various recorder wheels and segment 82, and may, if desired, pass under a suitable guide 95. The lower face of one of these spools is provided with ratchet teeth 96, by means of which the spool may be rotated to feed the ribbon. A similar spool 97 is arranged adjacent each of the spools 88, and each is supported by a stud or post 98, and to these spools is secured a strip of paper 99, in a similar manner as the inking ribbon, by means of caps 100, and the paper extends across the faces of the recording wheels, parallel with and in close proximity to the inking ribbon 92.

The spool 97, adjacent to the spool 88 which is provided with the ratchet teeth 96, is also provided with similar ratchet teeth 101, which are adapted to be engaged by a spring-controlled dog or pawl 102 pivotaly supported by the casing 21, to prevent retrograde movement of the spool. The spools 88—97, with the ratchet teeth, are simultaneously rotated to feed the paper and ribbon, respectively, from the opposite spools, by means of a spring-controlled dog or pawl 103 engaging the ratchet 96 and a gravity dog 104 adapted to engage the ratchet 101. These dogs are suitably pivoted to a sliding arm or member 105, which is adapted to be moved by the movement of the bolt to cause the dogs or pawls to engage their respective ratchets, and the dogs and ratchets may be so arranged that the spools will be rotated the same distance to feed the paper and ribbon equally, or one may be rotated farther than the other, if desired.

The spool 97, which is provided with the ratchet 101, is also provided with projecting circumferential teeth 106 located preferably adjacent the ratchet 101, to form tappets. A printing platen 107 is pivoted to the casing 21, as at 108, and is provided with a rearwardly projecting portion or arm 109, the extremity of which normally stands within the path of movement of and is

adapted to be successively engaged and raised or tripped by the tappets 106.

A suitable spring 110 is secured to the casing 21 and engages the free end of the platen 107, to normally hold the same, together with the ribbon 92 and paper 99, in proximity to the printing peripheries of the recording wheels. The tappets 106 are so arranged that each time the spool 97 is moved one step by the pawl or dog 104, one tappet will engage and raise the extremity 109 of the platen and depress the free end against the tension of the spring 110, and as the end 109 slips off of the tappet the spring will forcibly throw the platen, together with the inking ribbon and paper strip, against the peripheries of the recording wheels, to make an impression upon the paper by a direct stamping action of the platen. The arm or member 105 may be raised to operate the spools, in any desired manner, but a simple and efficient means comprises a link 111, one end of which is pivoted to the support 111^a, adjacent the bolt 24, and the other end is pivotally connected to the arm or member 105, adjacent the bolt 24.

Depending from the link 111, at a point preferably intermediate its ends, and disposed within the path of movement of the projection 35 on the bolt 24, is a similar tapering projection 112. A suitable spring 113 engages the link 111, for normally depressing the same and holding the arm or member 105 in its lowest position. As the bolt 24 is moved backward, the two projections 112 and 35 passing each other will cause the arm or member 105 to rise, as will be understood. This arm or member 105 is prevented from displacement, preferably, by means of a screw or bolt 114 passing through a slot 115 located preferably adjacent the upper end thereof, and into the casing 21. The link 111 may also be held in position by a spring 116 surrounding its pivot point, the other end of which is attached to the locking dog or tumbler 32, and tends to hold the end 33 thereof seated in one of the notches 34 in the bolt 24.

An arm or lever 117 is pivoted intermediate its ends, preferably to the support 111^a, and with its lower extremity 118 extending across the opening 30^a in the cam or tumbler 30. The other end thereof extends upward, and terminates adjacent the lug or projection 83 on the segment 82, and is enlarged as at 119. When the lower extremity 118 is moved to one side, in a manner to be described, the end 119 will engage the projection 83 and rock the segment 82, against the tension of the spring 86, a corresponding distance, and when the free end is released, the spring will return the segment to its original or normal position.

Extending into the aperture 30^a of the main cam or tumbler 30 are diametrically-

opposite projections 120, which are adapted to enter corresponding grooves 121 in the barrel or body 122 of a cam or member which is provided with stepped conical portions 123, and a reduced extremity 124. This member is adapted to move longitudinally in the cam or tumbler 30, and is held from displacement in any desired or suitable manner. A spring 125^a is arranged to engage the extremity 124 of this member, and yieldingly hold the same forward. One side of the stepped portions 123 is cut away or flat, as at 125, so that when a key is inserted in the barrel or body 122, it may be pushed backward against the tension of the spring 125 without engaging or interfering with the extremity 118 of the lever 117, and until the proper step 123, corresponding to the particular key used, is in line with the extremity 118. The barrel or body 122 may then be rotated, causing the particular step to rock the lever 117, and thereby move the segment 82 about its pivot to cause the corresponding type 85 supported thereby to be placed in alinement with the operative characters on the recorder wheels above the printing platen 107. When the key is removed, the spring 125^a will retract or move the barrel or body 122 forward again to throw the stepped portions out of alinement with the end of the lever 117.

Journaled in a suitable support 126 is a shaft 127, one end of which projects through the cover 22, and secured thereto is an arm 128 which rests against the bolt 24, and moves between two projections 129—130 extending laterally from the face of the bolt. This arm 128 is provided at its upper extremity with a projecting portion 131, which is preferably provided with an inclined upper face 132 adapted to engage and pass under a lateral projecting pin or lug 133 projecting from the locking dog or tumbler 32 preferably adjacent its pivot, so that when the arm 128 is oscillated by the shaft 127, the inclined face 132 will pass under the projection 133 to move the dog or tumbler 32 about its pivot for raising the end 33 thereof out of the notch 34. At the same time, the side of the arm will engage either of the pins or projections 129—130 to move the bolt in the desired direction. The end of the shaft 127 is preferably provided with a slot 134, into which the end of a suitable key may be inserted for rotating the same.

In operation, each time the circuit is completed the coils 70 will be energized and will attract the armature 72 against the tension of the spring 75, and raise the operating dog or pawl 76, the extremity of which will travel over the ratchet 43 on the minute wheel 38. When the circuit is broken, the spring will retract the armature, causing the dog or pawl 76 to rotate the minute wheel one step. The rotation of the minute wheel

will rotate the gear 42, which, in turn, will transmit motion to the shaft 59, through the medium of the gear wheel 60. As the shaft 59 rotates, the tappet or spur wheel also rotates, and engages the projection 62 on the arm 63 to move the dog or pawl 65 backward against the tension of the spring 66. This gear 60 is of such a size, and the arms of the tappet or spur wheel 61 are of such a length, that at the time the minute wheel has made its sixtieth step of rotation, the end of the arm will move out of engagement with the projection 62, and the spring 66 will retract the arm 63 and cause the dog 65 to move the hour wheel 37 one step of rotation to change the hour. This operation will continue until the hour wheel 37, in this exemplification, has moved twelve steps of rotation. Upon the thirteenth step, the projection 41 on the hour wheel 37 will engage the spur or pinion wheel 68 and rotate the same, together with the shaft 67, one step. This motion is transmitted by means of the pinion wheel 69, on the shaft 67, to the day wheel 57, which will move said wheel one step of rotation to change the day. When desired, the day and month wheels 51—45 may be rotated and set by means of the hands or pointers 53—48.

The individual keys for operating the bolt 24 are differentiated from each other by a slight difference in the length of their operating ends, such difference in each instance being equal to the height of one of the steps 123 of the differentiated or stepped barrel or body 122. When one of the keys is inserted into the key-hole, the barrel or body 122 will be shoved back longitudinally against the tension of the spring 125, and until the corresponding step or shoulder 123 is in alinement with the end 118 of the lever 117, the flat portion 125 permitting such positioning. The key may be then rotated, causing the cam or tumbler 30 to be rotated through the medium of the interengaging slots 120 and lugs 121. The rotation of the cam or tumbler 30 will cause the projection 29 thereon to pass under and engage the locking dog 32 and raise the end 33 thereof out of the notch 34. A continued rotation will cause the projection 29 to engage one of the walls of the cutaway portion 31 in the bolt 24 to move the bolt. At the same time, the rotation of the stepped or differentiated portion 123 will rock the bar 117 to move the type segment 82 about its pivot, for placing the corresponding designating type in operative position with relation to the printing platen.

As the bolt 24 moves in either direction to lock or unlock the closure, the cam or projecting tapered portion 35 will engage the depending cam or tapered portion 112 on the link 111, to raise the same and also raise the arm or member 105. The movement of this

arm or member 105 will rotate the adjacent spools 93—100, through the medium of the pawls 103—104 and ratchets 96—101, in the manner already set forth. Thus it will be seen that each time the tappet wheel 106 is moved one step of rotation, the printing platen 107 will be brought against the type faces of the recording wheels and the segment with a direct stamping action, causing an impression to be made upon the paper of the exact day, hour and minute the lock was operated to open the closure, and also of the character which designates the particular key used for opening the same. When it is desired to again lock the closure, the key is rotated in the opposite direction, which will operate the printing platen in the same manner to print upon the paper, the exact time at which the bolt 24 was operated and also the particular key used for locking the same, thereby also giving a correct record of the length of time the closure remained open or the lock remained unlocked. The same results will be produced if the bolt is shot by a separate key rotating the shaft 127, and in this instance the character upon the segment 82 designating this key will be so arranged as to be in operative position when the segment is in its normal position, thereby dispensing with the necessity of rocking the positioning bar 117.

Any suitable means may be employed for throwing the printing mechanism out of operation, but a simple and efficient means for accomplishing this purpose will now be described.

Projecting from the outer face of the casing 21 is a key barrel 135 (see Fig. 9), and seated within this barrel is a key socket member 136, the bottom of which is reduced as at 137, and projects through the casing. Secured to this reduced end 137, and within the casing 21, is a crank arm 138, and extending from a point adjacent the free end of the arm is a laterally projecting pin 139. A gravity or retaining member 140 is suitably mounted within the casing by means of a screw or bolt 141 passing through a slot 142 therein, and into the back of the casing. If desired, the support for the spring-controlled dog or pawl 40 may pass through said member to prevent rotation thereof about the screw or bolt 141. This member is so arranged with relation to the crank arm 138 that the pin 139 thereon will rest in the bottom of a notch 143 in the top end thereof, and the bottom of said member will be engaged by a projection 144 on the segment 82, to hold the bottom of the notch 143 against the pin or lug 139.

One edge 145 of the notch 143 is higher than the other edge 146, and said edge 146 is preferably rounded, for a purpose to be set forth. The extremity 147 of the operating arm or member 105 is preferably bent

at a right angle to the body portion and stands adjacent the top of the crank arm 138 and in the path of the movement thereof, so that when a key 148 is inserted in the socket 136 and rotated, the crank arm 138 will also be rotated, and will engage the portion 147 of the arm or member 105 and raise the same, together with the link 111, which will also raise the cam or tapered projection 112 out of the path of movement of the cam or projection 35 on the bolt 24, which will permit the bolt to be shot without operating the recording or printing mechanism.

As the crank arm 138 is rotated, the pin or projection 139 thereon will engage the inclined face 149 and depress the member 140 against the tension of the spring 86 of the segment 82, to permit the pin or projection to pass and the crank arm 138 to be freely rotated. After the pin or projection has passed over the end 149, the spring 86, through the medium of the segment 82 and the projection 144 thereon, will return the retaining member 140 to its normal position, to prevent the projection or pin 139 from returning into the notch 143 without the crank arm making a complete rotation and passing over the lower rounded portion 146. This operation will cause the printing platen to strike the type and also make an impression.

In order to prevent the key 148 from being withdrawn while the recording mechanism is held out of operative position, the key barrel 135 is provided with an inwardly-projecting wing or web 150, which extends into the opening therein and is located preferably near the forward end thereof. The socket member 136 is provided with a slot 151. The key 148 is provided with a reduced portion 152 adjacent one end to form a circumferential flange 153 to produce a shoulder 154, and the extremity of the key is also reduced, as at 155. One side of the flange 156 is flattened, while both sides of the reduced extremity 155 are flat.

The key is inserted into the barrel 135 by placing the flattened side 156 of the collar 153 adjacent the free edge of the wing or web 150, when the key will readily enter the barrel, so that the reduced extremity 155 will enter the slot 151 in the rotary socket 136, and the shoulder 154 will rest upon the edge of said socket. When in this position, the reduced portion 152 will be in line with the wing or web 148, and when the key is rotated to turn the crank arm 138, the collar 153 will pass under the web or wing 150 and remain thereunder until the crank arm 138 has been turned back to its normal position, as shown in Fig. 7. The reduced portion 155 of the key 148 may also be of a size to fit in the slot 134 in the shaft 127, for oscillating the arm 128.

Any suitable means may be provided for recording the number of times the bolt 24 has been moved, so that this information may be obtained without the necessity of removing the cover to inspect the tapes. A simple and efficient means for accomplishing this purpose comprises a cyclometer 157 secured to the inside of the cover 22 by means of the casing 158, and which is visible from the outside through a suitable aperture 159. This cyclometer is provided with a spring-controlled arm 160, the end of which stands within the path of movement of a projection or arm 161 operatively related to the bolt 24, so that when the bolt is moved back to unlock the lock, the arm or projection 161 thereon will engage the cyclometer arm and move it against the tension of the spring (not shown). Upon the forward movement of the bolt 24, the spring will move the arm 160 back to its normal position, which movement will cause the units disk of the cyclometer to register one. A suitable stop 162 may be provided to check the movement of the arm 160. A similar cyclometer 163 may also be provided for recording the number of times the cover 22 has been removed. In this instance, the spring-controlled arm of the cyclometer will engage and be depressed by a projection 164 in the casing 21, when the cover 22 is placed upon the casing, but when removed the spring will act upon the arm in a similar manner as the arm 160 of the cyclometer 157, and record one for each time that the cover has been removed.

In order that the invention might be fully understood, the details of an embodiment thereof have been thus specifically described; but

What we claim is:—

1. In a recording lock, the combination of a recording mechanism including identifying means, a locking bolt, key-controlled mechanism for setting said identifying means and moving the bolt, a platen, and means other than the bolt controlled by the movement of the bolt for operating the platen when the bolt is advanced or retracted.

2. In a recording lock, the combination of a recording mechanism, electro-responsive means for setting said mechanism, a locking bolt, means for moving the bolt, a platen, and means controlled by the movement of the bolt for operating the platen.

3. In a recording lock, the combination of a recording mechanism, electro-responsive means for intermittently setting said mechanism, a locking bolt, a platen, means for moving the bolt, and means controlled by the movement of the bolt for operating the platen.

4. In a recording lock, the combination of a recording mechanism, electro-responsive means for setting said mechanism, identify-

ing means associated with the recording mechanism, a locking bolt, a platen, and means controlled by the movement of the bolt for operating the platen.

5 5. In a recording lock, the combination of a recording mechanism, electro-responsive means for setting said mechanism, identifying means associated with said mechanism, a locking bolt, key-controlled mechanism for setting said identifying means and moving the bolt, a platen, and means controlled by the movement of the bolt for operating the platen.

6. In a recording lock, the combination of a recording mechanism, a locking bolt, means for moving said bolt, a pivoted platen, yielding means for holding said platen normally adjacent the recording mechanism, and means controlled by the movement of the bolt in either direction for rocking said platen about its pivot and against the tension of said yielding means and for releasing the platen.

7. In a recording lock, the combination of a recording mechanism, including an identifying means, a locking bolt, key-controlled mechanism for setting said identifying means and moving said bolt, a pivoted platen, yielding means for normally holding said platen adjacent the recording means, and means controlled by the movement of the bolt in either direction for tripping said platen against the tension of said yielding means.

8. In a recording lock, the combination of a recording mechanism, electro-responsive means for intermittently setting said mechanism, an identifying means associated with the recording mechanism, a locking bolt, key-controlled mechanism for setting said identifying means and moving the bolt, a platen, yielding means for holding said platen normally adjacent the recording mechanism, and means controlled by the movement of the bolt in either direction for tripping the platen against the tension of the said yielding means.

9. In a recording lock, the combination of a recording mechanism, electro-responsive means for setting said mechanism, a locking bolt, means for moving said bolt, a platen, means for moving said platen, and means operatively related to the bolt for engaging and moving said platen-moving means when the bolt is moved.

10. In a recording lock, the combination of a recording mechanism, a locking bolt, means for moving said bolt, a pivoted platen, yielding means for holding said platen normally adjacent the recording mechanism, means for tripping said platen against the tension of the yielding means, and means operatively related to the bolt and adapted to engage and operate said tripping means when the bolt is moved in either direction.

11. In a recording lock, the combination of recording mechanism, a locking bolt, means for moving said bolt, a movable platen, means for normally holding said platen adjacent the recording mechanism, rotative means adapted to engage said platen for moving the same away from the recording mechanism, means for forcibly returning said platen, and means controlled by the movement of the bolt for operating said rotative means.

12. In a recording lock, the combination of recording mechanism, a locking bolt, means for moving said bolt, a movable platen, yielding means for holding said platen normally adjacent the recording mechanism, a tappet, said tappet being adapted to engage the platen to move the same against the tension of the yielding means, and means operatively related to the bolt for tripping the tappet when said bolt is advanced or retracted.

13. In a recording lock, the combination of recording mechanism, a locking bolt, means for moving said bolt, a pivoted platen, means for yieldingly holding said platen normally adjacent the recording means, a rotary tappet, said tappet being adapted to engage the platen for tripping the same against the tension of said holding means, means for rotating the tappet, and means operatively related to the bolt for engaging and moving said tappet-operating means when the bolt is advanced or retracted.

14. In a recording lock, the combination of recording mechanism, a locking bolt, means for moving said bolt, a pivoted platen, yielding means for normally holding said platen adjacent the recording mechanism, a rotary tappet, a projection on the platen normally standing within the path of movement of the arms of the tappet, and means controlled by the movement of the bolt for rotating the tappet to trip the platen when the bolt is moved.

15. In a recording lock, the combination of recording mechanism, a locking bolt, means for operating said bolt, a movable platen, tripping mechanism for the platen including means controlled by the movement of the bolt for engaging and moving the platen in one direction, and means for returning the same to its original position, whereby a direct stamping action will be imparted to the platen when the bolt is either advanced or retracted.

16. In a recording lock, the combination of recording mechanism, electro-responsive means having means remote from the lock for energizing the same, said first means being adapted to move said mechanism, a locking bolt, means for moving said bolt, an impression device movable toward and away from said recording mechanism, and means controlled by the movement of the bolt for

imparting a direct stamping action to said impression device when the bolt is moved.

17. In a recording lock, the combination of recording mechanism, electro-responsive means having means remote from the lock for energizing the same to operate the recording mechanism, an identifying means associated with the recording mechanism, a locking bolt, a differentiated means for setting said identifying means and moving the bolt, an impression device movable toward and away from the recording mechanism and identifying means, and means controlled by the movement of the bolt for imparting a direct stamping action to said impression means, whereby a simultaneous impression may be obtained from the recording mechanism and the indicator means.

18. In a recording lock, the combination of a locking bolt, means for advancing and retracting said bolt, means independent of said first means for also advancing and retracting the bolt, and mechanism actuated by the movement of the bolt for recording said movement and the identity of the particular operating means employed.

19. In a recording lock, the combination of a locking bolt, a time and date recording mechanism, an identifying means associated with the recording mechanism, differentiated means for advancing and retracting the bolt and for setting said identifying mechanism, means independent of said differentiated means for actuating the bolt, means for normally holding said identifying means to indicate the said independent means, and mechanism actuated by the movement of the bolt for recording said movement and the identity of the particular operating means employed.

20. In a recording lock, the combination of a locking bolt, a time and date recording mechanism, electro-responsive means for actuating said mechanism, an identifying means associated with the recording mechanism, differentiated means for advancing and retracting the bolt and for setting said identifying mechanism, means independent of said differentiated means for actuating the bolt, means for normally holding said identifying means to indicate the said independent means, and mechanism actuated by the movement of the bolt for recording said movement and the identity of the particular operating means employed.

21. In a recording lock, the combination of recording mechanism, an identifying means associated with said mechanism, means for yieldingly holding said identifying means in position, a locking bolt, differentiated means for advancing and retracting the bolt, a pivoted lever, one end of which stands within the path of movement of the differentiated means, the other end standing adjacent the identifying means, said

differentiated means being adapted to engage and move the adjacent end of the lever to cause the other end thereof to engage and move the identifying means against the tension of the yielding means to set the same, and mechanism actuated by the movement of the bolt for recording said movement and the identity of the particular operating means employed.

22. In a recording lock, the combination of recording mechanism comprising time and date wheels, electro-responsive means for setting said wheels, a locking bolt, means for moving said bolt, mechanism actuated by the movement of the bolt for recording said movement, and means for manually setting said date wheels.

23. In a recording lock, the combination of a locking bolt, means for advancing and retracting said bolt, mechanism actuated by the movement of the bolt in either direction for recording said movement, and means for permitting the movement of the bolt independent of the recording mechanism.

24. In a recording lock, the combination of a locking bolt, means for advancing and retracting said bolt, mechanism actuated by the movement of the bolt in either direction for recording said movement, and means for locking said mechanism out of operative position to permit the bolt to be moved independently thereof.

25. In a recording lock, the combination of a locking bolt, means for advancing and retracting said bolt, mechanism actuated by the movement of the bolt in either direction for recording said movement, means for locking said mechanism out of operative position, a key for operating the last said means, and means for preventing the removal of the key while the recording mechanism is out of operative position.

26. In a recording lock, the combination of recording mechanism, a locking bolt, means for moving said bolt, a movable platen, a recording strip feed, means controlled by the movement of the bolt for actuating the feed, and means operatively related to the feed for moving the platen to cause an impression upon the strip.

27. In a recording lock, the combination of recording mechanism, a locking bolt, means for moving said bolt, a movable platen, yielding means for normally holding the platen adjacent the recording mechanism, a recording strip feed, means controlled by the movement of the bolt for actuating the feed, and a tappet operatively related to the feed for engaging the platen for moving the same against the tension of the yielding means.

28. In a recording lock, the combination of recording mechanism, a locking bolt, means for moving said bolt, a record strip spool, means controlled by the movement of

the bolt for rotating the spool to feed the strip, tappet arms on said spool, a movable platen, and yielding means for holding said platen normally adjacent the recording means, said tappet arms being adapted to successively engage the platen and move the same against the tension of the holding means as the spool is rotated.

29. In a recording lock, the combination of recording mechanism, a locking bolt, means for moving said bolt, a tappet, a spool supported by the tappet and adapted to receive a record strip, means controlled by the movement of the bolt in either direction for rotating the tappet and feeding the strip, and impression means movable toward and away from the recording mechanism, said tappet being adapted to intermittently engage the impression means to transmit a direct stamping action thereto.

30. In a recording lock, the combination of a recording mechanism, a locking bolt, means for moving said bolt, a record strip support, means for rotating said support, means controlled by the movement of the bolt in either direction for operating the last said means, tappet arms on the support, and a spring-controlled impression device adapted to be engaged and tripped by the tappet when the support is rotated to impart a direct stamping action to the impression device.

31. In a recording lock, the combination of recording mechanism, a locking bolt, means for moving said bolt, an inking ribbon, supports for a record tape and ribbon, means for simultaneously moving said supports for feeding said tape and ribbon, means controlled by the movement of the bolt in either direction for operating the last said means, an impression means movable toward and away from the recording mechanism, and means operatively related to one of the supports for moving the impression means to cause the same to force the ribbon and tape against the recording mechanism for obtaining a record therefrom.

32. In a recording lock, the combination of recording mechanism, a locking bolt, means for moving said bolt, a record tape and an inking ribbon support, a ratchet on each of said supports, dogs for engaging the ratchets, means controlled by the movement of the bolt in either direction for moving said dogs to simultaneously rotate the supports for feeding the tape and ribbon, a tappet on one of said supports, and a spring-controlled pivoted platen, a portion of which normally stands within the path of movement of the tappet and adapted to be engaged and tripped thereby against the tension of the spring.

33. In a recording lock, the combination of recording mechanism, a locking bolt,

means for moving said bolt, a record tape support, a cap removably engaging the support and the tape for securing the latter to the support, means for moving the support to feed the tape, means controlled by the movement of the bolt in either direction for operating the last said means, an impression means movable toward and away from the recording mechanism, and means for moving the last said means.

34. In a recording lock, the combination of recording mechanism, a locking bolt, means for moving said bolt, means for feeding a record tape, means controlled by the movement of the bolt in either direction for operating the feeding means, mechanism actuated by the movement of the feeding means for recording the movement of the bolt, and means adapted to engage the feeding means for locking said feeding and recording means out of operative position with relation to the bolt to permit an independent movement of the latter.

35. In a recording lock, the combination of recording mechanism, a locking bolt, means for moving said bolt, means for feeding a record tape, means controlled by the movement of the bolt in either direction for operating the feeding means, mechanism actuated by the movement of the feeding means for recording the movement of the bolt, means adapted to engage the feeding means for locking said feeding and recording means out of operative position with relation to the bolt to permit an independent movement of the latter, means engaging the last said means for operating the same, and means for preventing the removal of the last said operating means when the recording and feeding mechanism are out of operative position.

36. In a recording lock, the combination of recording mechanism, a locking bolt, means for moving said bolt, a record tape support, a movable member, interengaging means on the member and support for operating the latter, means operatively related to the bolt and adapted to move the member when the bolt is advanced, or retracted mechanism actuated by the movement of the support for recording the movement of the bolt, and a crank arm adapted to engage the member to move and hold the same out of operative position with relation to the bolt.

37. In a recording lock, the combination of recording mechanism, a locking bolt, means for moving said bolt, a record tape support, a movable member, interengaging means on the member and support for operating the latter, means operatively related to the bolt and adapted to move the member when the bolt is advanced or retracted, mechanism actuated by the movement of the support for recording the movement of the bolt, a crank arm adapted to engage the

member to move and hold the same out of operative position with relation to the bolt, means connected to the crank arm and extending through the casing of the lock, and means removably engaging the last said means for operating said crank arm.

38. In a recording lock, the combination of recording mechanism, a locking bolt, means for moving said bolt, a record tape support, a movable member, inter-engaging means on the member and support for operating the latter, means operatively related to the bolt and adapted to move the member when the bolt is advanced or retracted, mechanism actuated by the movement of the support for recording the movement of the bolt, a crank arm adapted to engage the member to move and hold the same out of operative position with relation to the bolt, a key barrel on the outside of the lock casing, a rotative key socket within the barrel and operatively related to the crank arm, and a key adapted to be inserted in the socket for rotating the latter to move the crank arm.

39. In a recording lock, the combination of recording mechanism, a locking bolt, means for moving said bolt, a record tape support, a movable member, inter-engaging means on the member and support for operating the latter, means operatively related to the bolt and adapted to move the member when the bolt is advanced or retracted, mechanism actuated by the movement of the support for recording the movement of the bolt, a crank arm adapted to engage the member to move and hold the same out of operative position with relation to the bolt, a key barrel on the outside of the lock casing, a rotative key socket within the barrel and operatively related to the crank arm, a key adapted to be inserted in the socket for rotating the latter to move the crank arm, and inter-engaging means on the key and barrel for preventing the removal of the key when the crank arm is in its operative position.

40. In a recording lock, the combination of recording mechanism, a locking bolt, means for moving said bolt, mechanism for feeding a record tape, means controlled by the movement of the bolt in either direction for operating the feed mechanism, mechanism actuated by the movement of the feed mechanism for recording the movement of the bolt, a crank arm adapted to engage the feed mechanism for moving and holding the same out of operative position, and yielding means adapted to engage the crank arm for holding the same out of its operative position.

41. In a recording lock, the combination of recording mechanism, a locking bolt, means for moving said bolt, mechanism for feeding a record tape, means controlled by the movement of the bolt in either direction for operating the feed mechanism, mechanism

actuated by the movement of the feed mechanism for recording the movement of the bolt, a crank arm adapted to engage the feed mechanism for moving and holding the same out of operative position, means for engaging the crank arm for rotating the same, and means for compelling a complete rotation of the arm before its operating means can be disengaged therefrom.

42. In a recording lock, the combination of recording mechanism, a locking bolt, means for moving said bolt, mechanism for feeding a record tape, means controlled by the movement of the bolt in either direction for operating the feed mechanism, mechanism actuated by the movement of the feed mechanism for recording the movement of the bolt, a crank arm adapted to engage the feed mechanism for moving and holding the same out of operative position, means for engaging the crank arm for rotating the same, means for compelling a complete rotation of the arm before its operating means can be disengaged therefrom, and means for permitting said complete rotation in one direction only.

43. In a recording lock, the combination of recording mechanism, a locking bolt, means for moving said bolt, mechanism actuated by the movement of the bolt in either direction for recording said movement, and separate means adapted to place said recording mechanism out of operative position with relation to the bolt and to actuate said mechanism for recording the operation of said separate means.

44. In a recording lock, the combination of recording mechanism, a locking bolt, means for moving said bolt, means actuated by the movement of the bolt in either direction for feeding a recording tape, separate means adapted to move and hold said feeding mechanism out of operative position, and mechanism actuated by the movement of the feeding means for recording either the movement of the bolt or the operation of the said separate means.

45. In a recording lock, the combination of recording mechanism, a locking bolt, means for moving the bolt, said recording mechanism comprising a plurality of movable members, electro-responsive means for moving one of said members, means for intermittently transmitting said movement to another of said members, and mechanism actuated by the movement of the bolt for obtaining a record of said movement from the first said mechanism.

46. In a recording lock, the combination of recording mechanism, a locking bolt, means for moving the bolt, said recording mechanism comprising a plurality of movable members, electro-responsive means for moving one of said members, a tappet, means actuated by the movement of said member

for moving the tappet, means actuated by the tappet for moving another of said members, and means actuated by the movement of the bolt for obtaining a record of said movement from the first said mechanism.

47. In a recording lock, the combination of recording mechanism, a locking bolt, means for moving the bolt, said recording mechanism comprising a plurality of movable members, electro-responsive means for moving one of said members, a tappet, means actuated by the movement of said member for moving the tappet, a spring-controlled pawl actuated by the tappet for moving another of said members, and means actuated by the movement of the bolt for obtaining a record of said movement from the first said mechanism.

48. In a recording lock, the combination of recording mechanism, a locking bolt, means for moving the bolt, said recording means comprising a plurality of movable members, electro-responsive means for moving one of said members, a pawl and ratchet mechanism for operating another of said members, a tappet operated by the movement of the first member and adapted to move the pawl, means for returning the pawl to operate the second member, and means actuated by the movement of the bolt for obtaining a record of said movement from the first said mechanism.

49. In a recording lock, the combination of recording mechanism, a locking bolt, means for moving the bolt, said recording means comprising a plurality of movable members, electro-responsive means for moving one of said members, yielding means for moving another of said members, a tappet operated by the first said member, said tappet being adapted to engage said yielding means for moving the same against the tension thereof to operate the said second member, and means actuated by the movement of the bolt for obtaining a record of said movement from the first said mechanism.

50. In a recording lock, the combination of recording mechanism, a locking bolt, means for moving the bolt, said recording means comprising a plurality of movable members, electro-responsive means for moving one of said members, a trip mechanism for moving another of said members, means actuated by the movement of the first said member for operating the trip mechanism, means actuated by the second said member for moving a third one of said members, and mechanism actuated by the movement of the bolt for obtaining a record of said movement from the first said mechanism.

51. In a recording lock, the combination of recording mechanism, a locking bolt, means for moving said bolt, said recording means comprising a plurality of movable members, electro-responsive means for mov-

ing one of said members, tappet mechanism operated by said member for intermittently moving another one of said members, means operated by the last said member for intermittently operating a third one of said members, and means actuated by the movement of the bolt for obtaining a record of said movement from the first said mechanism.

52. In a recording lock, the combination of recording mechanism, a locking bolt, means for moving said bolt, said recording mechanism comprising a plurality of independently movable members having printing faces, electro-responsive means for moving one of said members, means actuated by the movement of said member for intermittently operating another of said members, means actuated by the last said member for intermittently operating a third one of said members, means for also manually moving the last said member, and mechanism actuated by the movement of the bolt for obtaining a record of said movement from the first said mechanism.

53. In a recording lock, the combination of recording mechanism, a locking bolt, means for moving said bolt, said recording mechanism comprising a plurality of independently movable members having printing faces, electro-responsive means for moving one of said members, means for preventing retrograde movement of said member, means actuated by the movement of said member for intermittently moving another of said members, means for preventing retrograde movement of the last said member, means actuated by the movement of the last said member for intermittently moving a third one of said members, mechanism actuated by the movement of the bolt for obtaining a record of said movement from the first said mechanism, and means for manually moving said third member in either direction.

54. In a recording lock, the combination of recording mechanism, a locking bolt, means for moving said bolt, said recording mechanism comprising a plurality of independently movable members having printing faces, electro-responsive means for moving one of said members, means for preventing retrograde movement of said member, means actuated by the movement of said member for intermittently moving another of said members, means for preventing retrograde movement of the last said member, means actuated by the movement of the last said member for intermittently moving a third one of said members, mechanism actuated by the movement of the bolt for obtaining a record of said movement from the first said mechanism, means for manually moving said third member in either direction, and means for retaining said member in its adjusted position.

55. In a recording lock, the combination of a locking bolt, means for moving the bolt, recording mechanism comprising a plurality of movable members, electro-responsive means having a source of energy remote from the lock, and comprising a magnet and an armature, an operating pawl actuated by the armature for moving one of the members, means for guiding said pawl, means for preventing retrograde movement of the member, means actuated by the movement of the first said member for intermittently moving another of said members, and mechanism actuated by the movement of the bolt for obtaining a record of said movement from the first said mechanism.

56. In a recording lock, the combination of a locking bolt, recording mechanism comprising a plurality of independently movable members, electro-responsive means for actuating one of said members, means actuated by the movement of said member for intermittently moving another of said members, an identifying means associated with the recording mechanism, differentiated means for setting said identifying means and moving the bolt, and mechanism actuated by the movement of the bolt for obtaining a record of said movement from the first said mechanism and the identifying means.

57. In a recording lock, the combination of a locking bolt, recording mechanism comprising a plurality of independently movable members, electro-responsive means for actuating one of said members, means actuated by the movement of said member for intermittently moving another of said members, an identifying means associated with the recording mechanism, a plurality of separate and independent means for moving the bolt, and mechanism actuated by the movement of the bolt for obtaining from the first said mechanism a record of said movement and the identity of the particular operating means employed.

58. In a recording lock, the combination of a casing containing recording mechanism, a locking bolt, means for moving said bolt, mechanism actuated by the movement of the bolt for obtaining a record of said movement, and a visible indicator also actuated by the movement of the bolt for recording the movements of said bolt.

59. In a recording lock, the combination of a casing containing recording mechanism, a locking bolt, means for moving said bolt,

mechanism actuated by the movement of the bolt for obtaining a record of said movement, and a cyclometer visible through the casing and also actuated by the movement of the bolt for recording the movements of said bolt.

60. In a recording lock, the combination of a casing containing recording mechanism, a bolt, means for actuating the bolt, means for obtaining a record of said movement, a cover for the casing, and means secured to and visible through the cover and actuated by the bolt for visually indicating the movement of said bolt.

61. In a recording lock, the combination of a casing, locking mechanism within the casing and including a movable bolt, a cover for the casing, means secured to the cover and actuated by the bolt for registering the movement thereof, and means actuated by removing the cover for obtaining a record of said removal.

62. In a recording lock, the combination of a casing, locking mechanism within the casing and including a movable bolt, a cover for the casing, an indicator secured to and visible through the cover, means on the bolt moving said indicator when the bolt is moved, an independent indicator also secured to the cover, and means automatically actuated by the removal of the cover for moving the last said indicator.

63. In a recording lock, the combination of a casing, locking mechanism within the casing and including a movable bolt, a cover for the casing, a plurality of cyclometers secured to and visible through the cover, means actuated by the movement of the bolt for moving one of said cyclometers for registering the movement of the bolt, and means actuated by the removal of the cover for moving the other cyclometer for registering the removal of said cover.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, respectively on this 10th day of September A. D. 1906 and on this 6th day of September 1906.

JOHN F. PIXLEY.
LE GRAND C. BUSH.

Witnesses to Pixley:

N. B. GILL,
H. C. PARK.

Witnesses to L. C. Bush:

J. H. JOCHUM, JR.,
E. C. SEMPLE.