

No. 678,556.

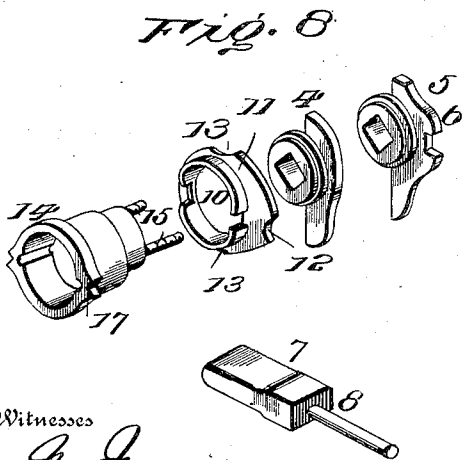
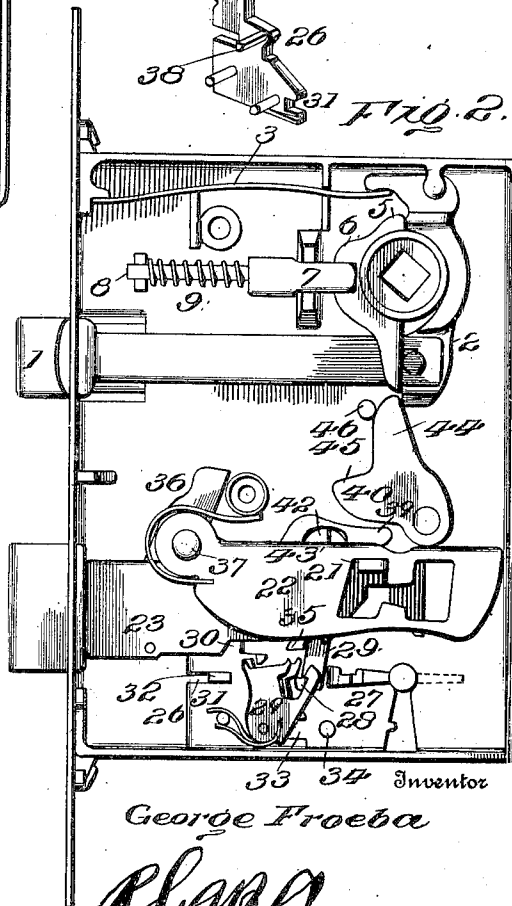
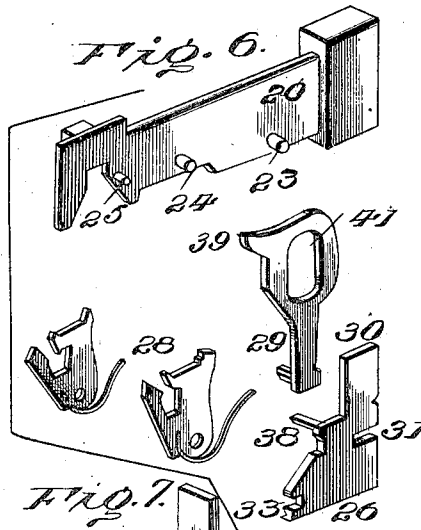
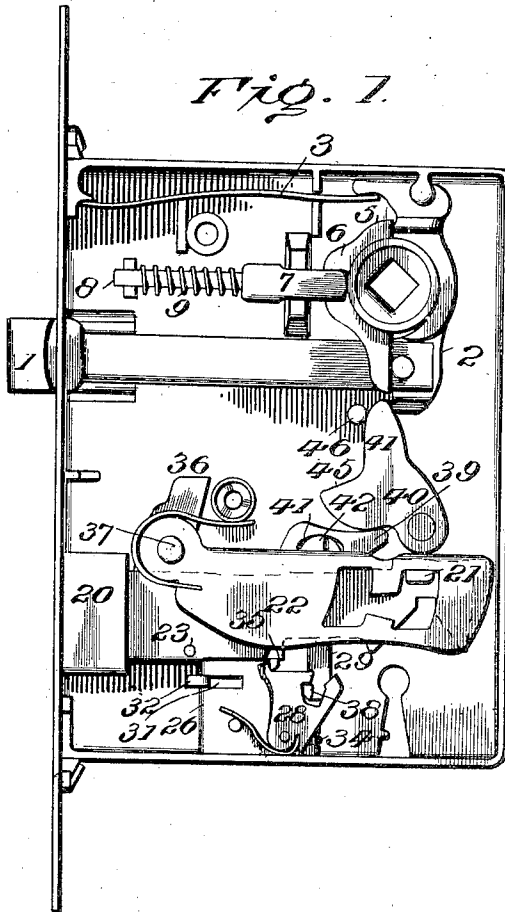
G. FROEBA.
LOCK.

Patented July 16, 1901.

(No Model.)

Application filed Nov. 20, 1900.)

2 Sheets—Sheet 1.



Witnesses

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334

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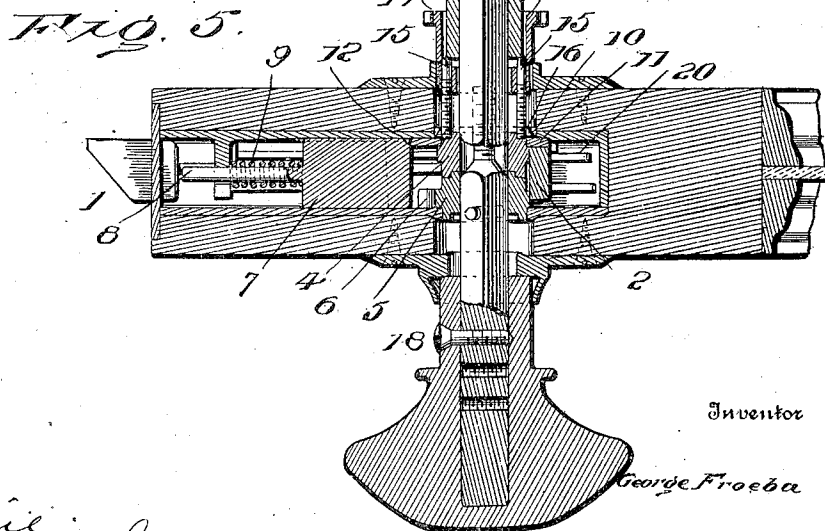
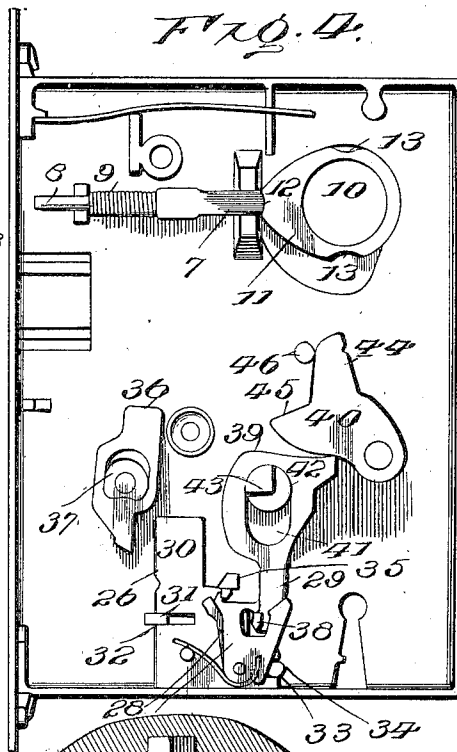
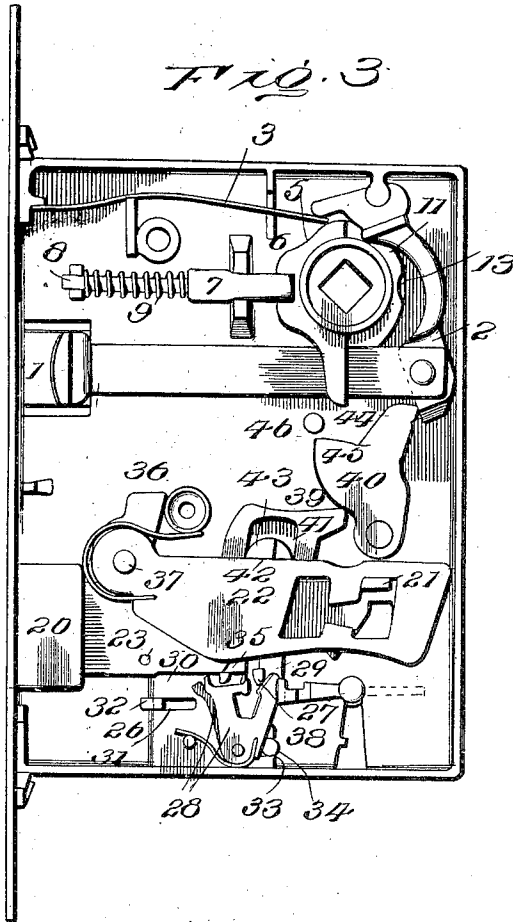
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(Application filed Nov. 20, 1900.)

2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

GEORGE FROEBA, OF NEW BRITAIN, CONNECTICUT.

LOCK.

SPECIFICATION forming part of Letters Patent No. 678,556, dated July 16, 1901.

Application filed November 20, 1900. Serial No. 37,145. (No model.)

To all whom it may concern:

Be it known that I, GEORGE FROEBA, a citizen of the United States, residing at New Britain, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Locks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention aims to provide a lock of simple and effective construction embodying a night-latch feature operable by means of the main key employed for throwing the bolt, the latch-locking mechanism being thrown into and out of action from within by means of a collar mounted upon the knob-spindle, the parts being so constructed that the latch can be operated from the inner knob whether the latch-locking mechanism is on or off.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result reference is to be had to the following description and drawings hereto attached.

While the essential and characteristic features of the invention are necessarily susceptible of modification, still the preferred embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a detail view of a lock embodying the invention, the cap-plate of the case being removed to expose the operating parts, the latch being locked against actuation by the outer knob and the bolt being retracted. Fig. 2 is a view similar to Fig. 1, showing the relation of the parts when the bolt is projected and the latch locked against operation by the outer knob. Fig. 3 is a view similar to Fig. 2, showing the manner of operating the latch by means of the key. Fig. 4 is a detail view similar to Fig. 1 with the latch, the latch-lever, the hubs, and the lock-bolt, with its tumbler, removed. Fig. 5 is a transverse section of the lock about in line with the knob-spindle, showing the relation of the parts when the lock is applied or fitted to a door. Fig. 6 is a detail view in perspective of the lock-bolt, key-operated bar, the movable plate, and the tumblers fitted thereto relatively arranged in a group. Fig. 7 is a perspective

view of the movable plate as seen from the reverse side from that illustrated in Fig. 6. Fig. 8 is a detail view in perspective of the hubs, the actuator, consisting of the inner collar and the outer collar or sleeve, and the stop.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The invention is adapted to be applied to any type of lock, either of the mortise or rim variety. The lock illustrated is of the mortise type and of ordinary construction, being modified in part to accommodate the elements constituting the present invention. The case, as is usual in devices of this character, is provided with lugs and projecting parts suitably disposed to hold the vitals in proper position without binding and against casual displacement.

The latch 1 has pivotal connection at its inner end with the latch-lever 2, which is of ordinary construction and acted upon by the spring 3. Duplicate hubs 4 and 5 are provided to cooperate with the latch-lever 2 in the manner well understood and receive the knob-spindle. The hub 5 is provided with a notched extension 6 to cooperate with a spring-actuated stop 7, by means of which the outer section of the knob-spindle is prevented from rotation when the night-latch attachment is on. The latch 1 is adapted to be operated by one or both hubs; but when the hub 5 is locked by engagement of the stop 7 entering the notch 6 thereof the latch can be operated by the inner knob only, a key being required to throw the latch from without by means which constitute the essence of this invention. The spring-actuated stop 7 is in the form of a bolt having a stem 8, upon which is mounted a spring 9, which is confined between the head of the bolt and a notched lug. This spring 9 normally exerts a force to throw the stop into the notch 6 of the hub 5. A collar 10 is mounted coaxially with the hubs and knob-spindle, and its inner end is flanged and widened to form a cam 11, which is adapted to ride upon the end of the stop 7 adjacent the hubs and throw said stop out of the notch 6 when it is desired to permit the latch to be operated by either knob. The highest point of the cam 11 is depressed, as

shown at 12, to form a seat to receive the proximal end of the stop 7 and prevent accidental movement thereof, so as to enter the notch 6 and lock the latch when not desired.

5 The depression 12 is curved and the end of the stop 7 is correspondingly curved, thereby permitting the unseating of the stop by the application of sufficient force to the collar 10 when it is required to release the stop 7 and

10 permit it to enter the notch 6 and lock the hub 5. The cam portions at the side of the depression 12 are symmetrically curved, thereby permitting the turning of the collar 10 in either direction. At the base of the cam

15 portions other depressions 13 are formed to constitute seats for the curved end of the stop 7, so as to fix the position of the operating means provided for actuating the said collar 10.

20 The operating means for the cam-collar 10 consist of a collar or sleeve 14, loosely mounted upon the knob-spindle at the tubular extension of the inner knob, and pins 15, extended from the inner end of the collar 14 to

25 enter notches 16, provided in the collar 10. These pins 15 may be formed with or applied to the collar 14, and by preference they are separate from said collar and have screw-thread connection therewith, so as to be ad-

30 justable and adapted to be replaced should they become broken or otherwise disabled for further effective service. When the collar 14 is of brass or kindred composition, the pins 15 may be of steel and capable of sus-

35 taining the stress to which they are subjected without bending or breaking. The outer end of the collar 14 is flanged and formed with projections 17 to admit of its firm grasping when turning the collar to set or release the

40 stop 7. It is to be understood that the flanged end of the collar 14 may be knurled or milled for finish and to enable the fingers to obtain a firm grip thereon.

The knob-spindle is composed of sections 45 18 and 19, designated for convenience as the "outer" and the "inner" sections, each provided with a knob correspondingly designated according to its particular location. These sections 18 and 19 have a swivel connection to

50 admit of their independent turning, whereby the inner hub 4 may be operated to throw the latch when the outer hub 5 is locked. The joint between the sections 18 and 19 is positioned so as to admit of the inner or

55 coupled ends of said sections engaging with the respective hubs 4 and 5. The inner section 19 of the hub-spindle is operable at all times whether the hub 5 is locked or not; but the outer section 18 can be turned only when

60 the hub 5 is released, thereby enabling the latch 1 to act in the capacity of the ordinary night-latch.

The lock-bolt 20 is adapted to be shot by the key in the ordinary manner and is provided with a stump 21 to coöperate with the

65 tumbler 22 in the manner well understood. A series of pins 23, 24, and 25 project from

the bolt 20 at different points in its length and coöperate with the latch mechanism in a manner presently to be described. A plate 70 26 is slidably mounted in the case adjacent to the keyhole, so as to be moved by the bit of the key 27, and is provided with tumblers 28 to be thrown by the key, so as to effect a release of a bar 29 when it is required to

75 throw the latch when the hub 5 is locked. The plate 26 has an arm 30, underlapping the bolt 20 and coming between the pins 23 and 24, and is formed with an open guide-slot 31 to receive a lug 32 of the case to assist

80 in holding the plate 26 in proper position and giving direction thereto in its sliding movements. The edge portion of the plate 26 opposite the notched portion of the tumblers 28 is cut away to provide clearance for the bit

85 of the key 27, and a notch 33 is provided in its edge adjacent to the cut-away portion to receive a pin 34, by means of which the position of the plate 26 is fixed when moved,

90 so as to be actuated by the key. A lug 55 is positioned so as to engage with an edge of the plate 26 and coöperate with the pin 34 to fix the position of said plate when the tumblers 28 carried thereby are in the path of

95 the key 27. An oscillating stop 36 is mounted upon the pin 37, upon which the tumbler 22 is pivoted, and extends in the path of the arm 30, so as to limit the outward movement of the plate 26 when thrown by the key.

The bar 29 is provided at one end with a 100 stump 38 to coöperate with the tumblers 28 and has an extension 39 at its opposite end to engage with a rocker 40, by means of which motion is transmitted from the bar 29 to the

105 latch-lever 2 to throw the latch when the outer knob is held against rotation in the manner aforesaid. The bar 29 is slidably mounted and has a limited oscillatory movement, so as to move with the plate 26 when

110 shifted by means of the lock-bolt. As shown, the bar 29 is formed with a slot 41, which receives a stud 42, upon which the said bar slides and turns. The end of the stud 42 is cut away, as shown at 43, to form a seat and a guide for the lock-bolt 20, which latter overlaps the bar 29 and holds it in place. The

115 lock-bolt also overlaps the plate 26 and prevents displacement thereof. The pin 25 at the inner end of the lock-bolt is adapted to come in contact with the bar 29 when the bolt

120 is shot and coöperate with the lug 35 and prevent any oscillatory movement of said bar. When the bolt 20 is withdrawn, the pin 24 comes in contact with the bar 29 and coöper-

125 ates with the stud 42 to prevent any rocking movement of said bar, whereby when actuated by the key 27 said bar moves rectilinearly and its toe extension 39, coming in contact with a part of the rocker 40, turns it and causes the withdrawal of the latch, as will

130 appear more fully hereinafter.

The rocker 40 is an idle lever and is adapted to transmit motion from the key-operated mechanism to the latch mechanism and com-

prises two arms 44 and 45. The upper arm 44 is in engagement with the latch-lever 2 and is limited in its movement in one direction by means of a stop 46, which also serves to limit the outward movement of the latch and the forward movement of the latch-lever. The lower arm 45 is formed with a curved edge in contact with the toe extension 39 of the bar 29, the upper edge of said bar being inwardly curved to admit of the oscillatory movements of said bar without interference with the rocker 40. The bolt 20 can be shot or withdrawn without interfering with the free operation of the latch by means of operating either the inner or outer knob, and when the outer knob is locked by throwing the stop 7 in engagement with the hub 5 the latch 2 can be operated from without by means of the key only. If the bolt 20 is shot, the first operation of the key 27 is to withdraw the bolt, and this throws the mechanism into position for actuation by the key when given a final one-quarter or other predetermined movement. When the bolt 20 is withdrawn, the bit of the key 27 throws the tumblers 28, so as to release the stump 38 of the bar 29, and a further turning of the key effects a sliding movement of the bar 29 and brings its toe extension 39 into engagement with the rocker 40, so as to turn the latter and cause the withdrawal or inward movement of the latch 1 in the manner set forth.

From the foregoing it will be understood that the lock combines in a single structure a lock-bolt, latch, and night-latch mechanism, the latter being adapted to be set and released from within without necessitating the opening of the door and the latch when locked against operation by means of the knob being adapted to be moved by the main key whether the lock-bolt be shot or not. Considering the advantages and results, the instrumentalities by means of which the invention is carried into effect are exceedingly simple, embody a minimum number of parts, and are effective in result and not susceptible of derangement or getting out of repair. It is further noted that the ordinary latch-spring 3 serves to return the key-operated latch mechanism to a normal position when actuated, thereby obviating the necessity for an independent spring for this purpose.

Having thus described the invention, what is claimed as new is—

1. In a lock, and in combination with the latch and operating mechanism therefor comprising a knob-spindle and hubs, the knob-spindle comprising independently-operated sections, a stop adapted to interlock with one of the hubs to prevent its operation by a knob and section of the knob-spindle, and means mounted coaxially with the knob-spindle for operating the said stop to throw it into and out of engagement with the operating-hub, and adapted to be operated when the door is closed, substantially as set forth.

2. In a lock, and in combination with the latch, and operating mechanism therefor comprising hubs and a sectional knob-spindle, one of the hubs having a notched extension, a spring-actuated stop adapted to secure one of the hubs against movement by entering the notch of its extension, and actuating means for the said stop to throw it into and out of interlocking connection with the notched extension of the aforementioned hub and mounted upon the knob-spindle, substantially as specified.

3. In a lock, and in combination with the latch and latch-operating mechanism, comprising a sectional knob-spindle and hubs, a stop for securing one of the said hubs against movement, an actuator for said stop in coaxial alinement with the hubs and located within the case, a complementary actuator exterior to the lock and in coaxial alinement with the hubs and inner actuator and adapted to be operated to throw the aforementioned stop into and out of interlocking engagement with the hub, and means between the inner and outer actuators to effect a simultaneous movement thereof, substantially as specified.

4. In a lock, and in combination with the latch and actuating mechanism comprising a sectional knob-spindle and hubs, a spring-actuated stop to interlock with one of the said hubs, and an actuator consisting of a rotatably-mounted part having a cam formed at its highest and lowest points with depressions constituting seats for the stop to properly position the actuator with reference to the stop and prevent casual displacement thereof in either of its extreme positions, substantially as set forth.

5. In a lock, and in combination with the latch and operating mechanism therefor comprising a sectional knob-spindle and hubs, a stop adapted to interlock with one of the said hubs, inner and outer complementary actuators for the said stop, the inner actuator having interlocking parts, and pins applied to the outer actuator and adapted to connect the said complementary parts, substantially as set forth.

6. In combination, a latch, actuating mechanism therefor comprising a sectional knob-spindle and hubs, a stop to interlock with one of said hubs, inner and outer complementary actuators for the said stop, and pins adjustably connected with the outer actuator and adapted to interlock with the inner actuator, as and for the purpose set forth.

7. In combination, a latch and actuating mechanism therefor comprising a sectional knob-spindle and hubs, a stop adapted to interlock with one of the said hubs, a collar coaxially mounted with the hubs having its inner end flanged and formed into a cam and depressed at its highest and lowest points, and a second collar rotatably mounted upon the knob-spindle and having interlocking

connection with the inner collar to compel simultaneous rotation of the two collars, substantially as set forth.

8. In a lock, the combination with the latch, 5
actuating mechanism therefor, a stop to secure the latch against operation by means of one of the knobs and the lock-bolt, a plate movable with the lock-bolt and bearing a tumbler, a bar having a stump cooperating 10
with the said tumbler and adapted to be released therefrom and to be moved by means of the key, and means for transmitting movement from the said bar to the latch-operating mechanism to withdraw a latch independently 15
of the knob-spindle, substantially as set forth.

9. In a lock, and in combination with the lock-bolt, the latch, latch-operating mechanism, and a stop for securing the latch against operation by means of the outer knob, a plate 20
movably mounted, a tumbler applied to said plate and movable therewith, a bar mounted to slide and to oscillate and having a stump engaged by the tumbler of the movable plate, and means for transmitting movement from 25
the said bar to the latch-operating mechanism, substantially as specified.

10. In a lock, and in combination with the lock-bolt, the latch, operating mechanism therefor, and a stop for securing the latch 30
against actuation by means of one of the knobs, a movably-mounted plate, cooperating means between the said plate and lock-bolt to effect a shifting of the plate, a tumbler applied to the movable plate, a bar mounted 35
to oscillate and to slide and having a stump cooperating with the tumbler applied to the movable plate, and means for transmitting movement from the said bar to the latch-operating mechanism, substantially as specified.

11. In a lock, and in combination with the 40
lock-bolt, the latch, operating mechanism therefor, and a stop for securing the latch against operation by means of one of the knobs, a plate movably mounted, cooperating means between the lock-bolt and plate to 45
effect a shifting of the latter with the said bolt, a tumbler applied to the movable plate, a bar mounted to oscillate and to slide and having a stump engaged by the tumbler of 50
the movable plate and formed with a lateral extension, and a rocker formed with a pair of arms, one of the arms in engagement with the latch-operating mechanism and the other arm adapted to be engaged by the aforementioned bar and extension thereof, the opposing 55
portions of the rocker and bar being correspondingly curved, substantially as set forth.

12. In a lock, and in combination with the lock-bolt, the latch, latch-operating mechanism and stop for securing the latch against 60
operation by means of one of the knobs, a key-operated mechanism shiftable toward and from the keyhole by means of the lock-bolt, and an intermediate device for transmitting motion from the said key-operated 65
mechanism to the latch-operating mechanism, and a single spring applied to the latch-operating mechanism for returning the key-operated and latch mechanisms to a normal position, substantially as set forth. 70

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

GEORGE FROEBA. [L. S.]

Witnesses:

HERMANN VOGEL,
ALBERT MORTON.