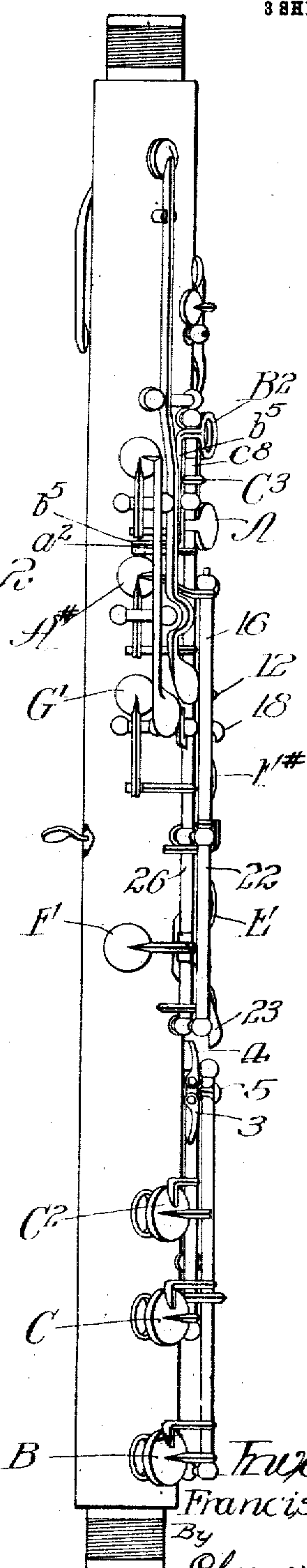
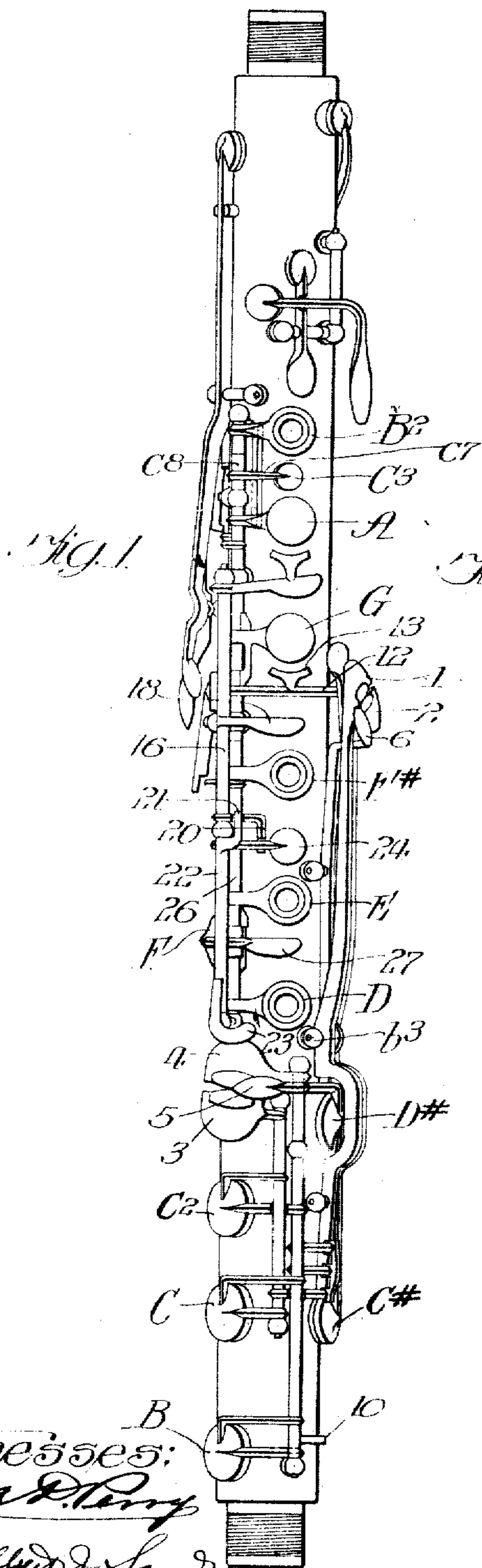


F. RAMOS.  
CLARINET.  
APPLICATION FILED FEB. 1, 1909.

950,602.

Patented Mar. 1, 1910.

3 SHEETS—SHEET 1.



Witnesses:  
*Edw. D. Perry*  
*Alfred J. Sausser*

Inventor:  
Francisco Ramos  
By  
*Cheever & Cox*  
Attys



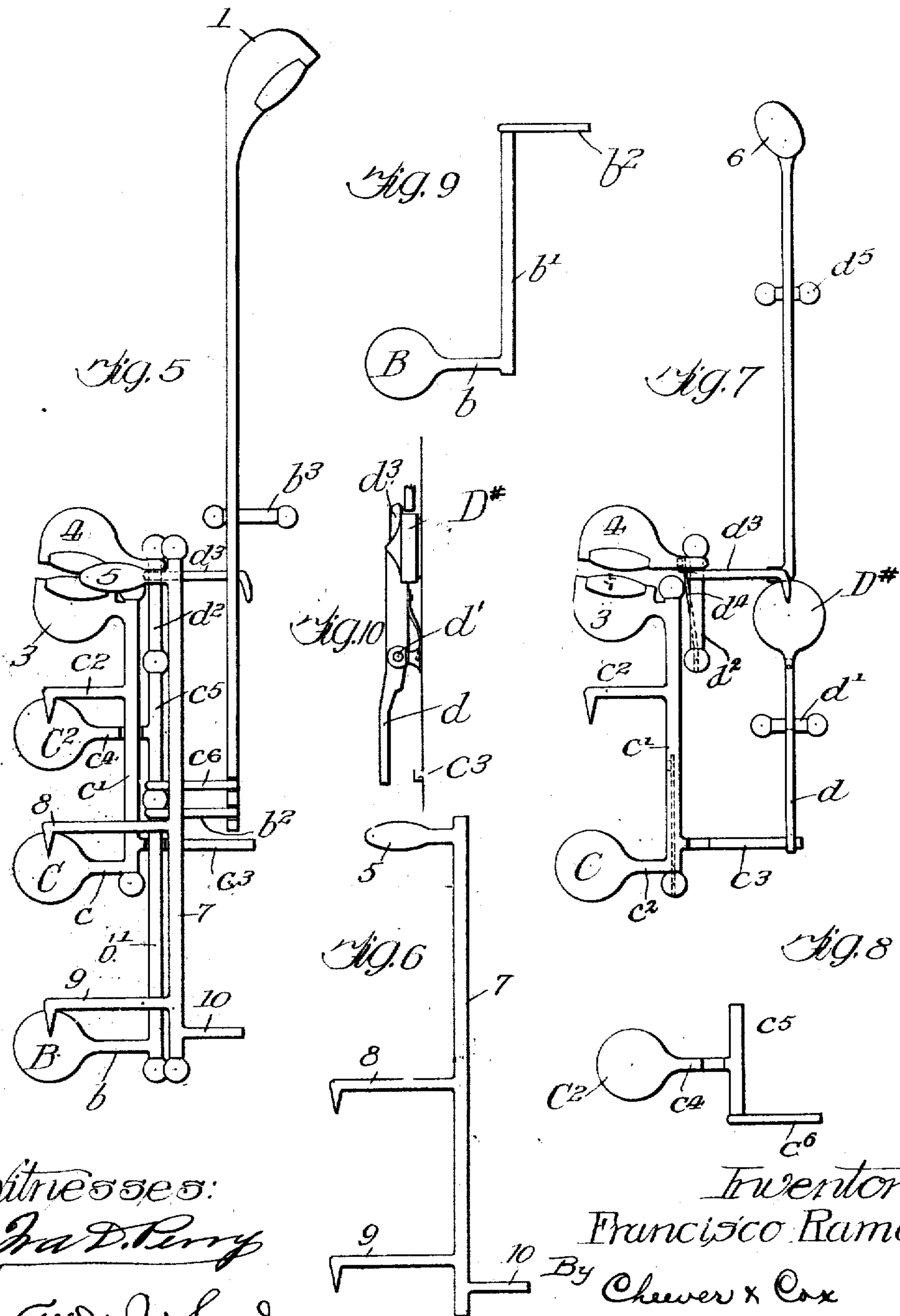
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3 SHEETS—SHEET 3.



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# UNITED STATES PATENT OFFICE.

FRANCISCO RAMOS, OF CHICAGO, ILLINOIS.

CLARINET.

950,602.

Specification of Letters Patent.

Patented Mar. 1, 1910.

Application filed February 1, 1909. Serial No. 475,352.

*To all whom it may concern:*

Be it known that I, FRANCISCO RAMOS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Clarinets, of which the following is a specification.

My invention relates to reed and wind instruments, particularly clarinets, saxophones, oboes, etc., and the object of the invention is to facilitate the playing of various sequences, also to facilitate the production of accurate pitch for certain notes as will hereinafter more fully appear.

In the accompanying drawings which illustrate a clarinet embodying my improvements: Figures 1 and 2 are views of different sides of a clarinet embodying my invention. Fig. 3 is a development or diagrammatic view of the keys and operating mechanism. Fig. 4 is a fragmentary sectional view on the line 4-4 Fig. 3 and Figs. 5 to 13 inclusive are detail views of various portions of mechanism as will be hereinafter more clearly brought out.

Similar letters and numerals refer to similar parts throughout the several views.

The letters A to G refer to musical notes and are applied to parts which are operated to produce the notes having the particular letters.

I will describe my improvements in connection with a B flat clarinet of the Albert type and will refer to the notes as of the upper register.

My instrument is provided with the pads B, C, C#, D#, F, G, G#, A and A# and rings D, E and F# as in the ordinary Albert B flat clarinet except that the holes A and G are closed with pad keys instead of ring keys.

Above the pad C is a pad C<sup>2</sup> covering a hole beneath it. Said pad is spring urged to remain normally open. The function of said pad and hole is to cooperate with pad C to produce the note C natural and also to cooperate with the pad B to produce the note C sharp. This is in conformity with the construction employed in the Albert system.

Above the pad A is a hole provided with a ring B<sup>2</sup> which is spring-urged to remain normally raised. This hole when closed by the finger of the player produces the note octave B, as in the Albert system. The ring at this hole operates the pad C<sup>1</sup> which covers a hole beneath it and is located be-

tween the pad A and ring B<sup>2</sup>. This pad must be raised to produce the proper pitch for the note F sharp in the lowest space of the musical staff and the C sharp above the staff as in the Albert system. Pad C<sup>2</sup> is spring urged to remain normally raised. It will be hereinafter apparent as to which of these are particularly concerned with my present improvements.

The pads B and C and C<sup>2</sup> are normally open, each being provided with a spring for this purpose. Pad C# is normally closed, being held in such position by means of a spring. The ring key D is normally down. The pad D# is provided with a weak spring which tends to raise it but is normally held closed by means of a stronger spring of key 4. Ring key E is normally open being provided with a spring for this purpose. Pad F is normally closed being provided with a spring for this purpose. Ring key F# is springless and loose. Pad G is normally open being provided with a spring for this purpose. Pad G# is normally held down by the parts which overlie it but is provided with a weak spring to raise it when released. Pad A is normally open and is provided with a spring for this purpose. A# is normally closed by the parts which overlie it but is provided with a weak spring for raising it when released. The ring B<sup>2</sup> forming the octave above B is normally open, being provided with a spring for this purpose.

I will first describe the special devices, including two auxiliary keys, by which I facilitate the playing of such sequences as B to D sharp (in the middle of the staff). Pad for B is mounted upon an arm or stem *b* of the rock shaft *b'* (see Fig. 5) which is spring urged to hold said pad in raised position. Said shaft has an arm *b''* extending in the opposite direction from stem *b* and overlying the lower end of key 1. Said key is fulcrumed between its ends at the point *b''*. The result is that when key 1 is depressed pad for B will descend and close the hole beneath it. The pad for C# is operated in the usual manner by the key 2. The pad for C is carried by an arm or stem *c* of the rock shaft *c'* which is spring urged in such direction as to hold the pad for C raised. Said rock shaft is operated by the key 3 and has an arm *c''* which overlies the pad C<sup>2</sup>.

The pad C<sup>1</sup> is carried by an arm *c'* of the



rock shaft  $c^5$  which is spring urged in such direction as to hold the pad  $C^2$  raised. Said rock shaft is also provided with an arm  $c^6$  which overlies the lower end of the lever of key 1. Thus pad  $C^2$  may be closed either by depressing key 1 or key 3 and the depressing of key 1 will close pad  $C^2$  and the pad for B and the depressing of key 3 will close  $C^2$ , and the pads for C and D#.

A special key 5 is secured to and operates a rock shaft 7 which is provided with arms 8, 9 and 10. The arms 8 and 9 extend in one direction and overlie the pads for C and B and the arm 10 extends in the opposite direction. Rock shaft 7 is spring urged in such direction as to hold the arms 8 and 9 in raised position. The arm 10 is merely a stop to prevent the arms 8 and 9 from rising too high. It will be seen that the construction is such that when key 5 is depressed the pad  $C^2$  and the pads for B, C and D# will be depressed to close the holes beneath them. The rock shaft  $c^7$  also has an arm  $c^8$  which extends in the opposite direction from arm  $c^6$  and  $c^8$  underlies the lever  $d$  of the pad for D#, (see Fig. 7). Said lever is pivoted between its ends at the fulcrum  $d'$  and is spring urged to hold pad for D# in raised position. Key 4 is secured to the rock shaft  $d^2$  which is provided with an arm  $d^3$  extending in the opposite direction from said key 4. Said arm has a projection adapted to overlie the pad for D#. A strong spring  $d^4$  urges rock shaft  $d^2$  in the proper direction and with sufficient force to overcome the spring of pad for D# and hold said pad closed. The auxiliary key 6, fulcrumed at the point  $d^5$  is adapted when depressed to elevate the arm  $d^3$  and thus permit the weak spring of the pad for D# to raise the latter.

The playing of the sequence B to D sharp will illustrate the advantage of the above described mechanism. Of course to produce B natural all of the holes must be closed and to make D sharp, the pad  $C^2$  and the pads for B, C and D# must be raised. In the old system the execution of this sequence requires the lifting of the little finger of the left hand from key 1 and simultaneously the slipping of the little finger of the right hand from key 3 to key 4. With my mechanism I am able to produce the note B by depressing both keys 5 and 6 and then I can produce the note D sharp by merely raising the little finger of the right hand from the key 5. The raising of key 5 causes the raising of pads for B, C and D# and pad  $C^2$ . Thus by holding the key 6 down and vibrating the key 5 the sequence B to D sharp and back may be rapidly and easily produced.

To play the sequence from C to D sharp the operation is the same as before except that the key 3 is vibrated instead of key 5.

I will now describe mechanism for facili-

tating the playing of sequences such as from G sharp to A (above the staff). Of course in order to produce the note G sharp the pad for G# must be up and the hole beneath it open. To produce the note A natural the pad for G must be up and the pad for G# must be down. In the old system this sequence G sharp to A natural required the simultaneous raising of both the third and fourth fingers of the left hand. As a result of my improvements it is possible to play this sequence by moving merely the third finger of the left hand. The improved mechanism whereby this is accomplished is shown in detail in Figs. 11 and 12. Pad for G is adapted to be touched directly by the finger and therefore may be referred to as a "pad key." It is carried by a stem  $g$  secured to the rock shaft  $g'$ . Said rock shaft has an arm  $g^2$  extending in the opposite direction from the stem  $g$  and adapted to overlie the extension  $g^3$  of the pad for G#. Pad for G# is fulcrumed at the point  $h$  and is spring influenced to normally remain in open position. The rock shaft  $g'$  however has a stronger spring and tends to hold pad for G# closed in spite of the force of the latter's spring. Consequently by pressing pad for G the hole beneath it will be closed and the hole G# will be opened thereby producing the note G sharp. Releasing pad for G will cause the hole beneath it to be opened and the hole G# to be closed thereby producing note A. Thus the sequence G sharp to A is produced by the action solely of pad for G.

I will now describe another of my improvements whereby the third finger of the left hand may, unassisted, cause the raising and lowering of the pad for G, as for example in playing G sharp (above the staff). In the Albert system this requires the cooperation of both the third and fourth fingers. The parts are illustrated in detail in Figs. 11 and 12. Adjacent to key pad G I place an arm 12 having a lug 13 lying in such position that it may be depressed by the third finger of the left hand at the same time that said finger depresses the pad for G. Said arm 12 is secured to the rock shaft 14 which is provided with an arm 15 lying on the opposite side from arm 12 and overlying the pad for G# which tends automatically to open. Said arm 12 is provided with a spring strong enough to overcome the spring of pad for G# and hold the latter closed. Arm 12 is long enough to underlie key 1 as shown in Fig. 1. As a result of the above described mechanism it is possible to hold both pads for G and G# closed by pressing the third finger of the left hand simultaneously upon pad key for G and lug 13.

I will now describe means for operating the pad for A# used in the production of



the note A sharp above the staff. The parts are shown in Fig. 3 and separately in Fig. 13. Pad for A# is mounted upon an arm or stem  $a$  pivoted at  $a'$  and spring urged to remain open. Said pad is provided with an extension  $a^2$  over which lies the arm  $b^5$  of the rock shaft  $b^6$  and the arm  $a^3$  of the rock shaft 4. Rock shaft  $b^6$  is operated by the ring key  $B^2$  and rock shaft  $a^4$  is operated by the pad key for A. Said shafts are urged in such direction that their arms  $b^5$  and  $a^3$  will hold the pad for A# closed in spite of the force of the latter's spring. Said pad is also normally held down against the force of its spring by the arm 16<sup>a</sup> of the rock shaft 16 which shaft is provided with keys 17 and 18, the keys 17 being located between the pads for G and A as shown. Key 17 is provided with an extension 19 adjacent to the pad key for A in such position that when desirable the player can with a single finger depress both the key for A and the lug 19. Said rock shaft 16 has a branch 20 underlying the extension 21 of the rock shaft 22 which is operated by the key 23 located adjacent to the key for D and key 4. Branch 20 also underlies the corrector pad 24 which is rigid with rock shaft 26 which operates pad F and is operated both by ring key for D and ring key for E and the key 27 located between them. The result is that said rock shaft 16 may be operated either by the lug 19 or keys 17, 18, 23, 24 or keys for D or E. By this arrangement I am able to dispense with one hole, to wit, the one usually located on the opposite side of the barrel from the hole beneath the pad for A#.

Another of my improvements is illustrated in detail in the upper portion of Fig. 13 and will now be described: To produce the proper pitch in playing the notes F# in the staff and C sharp above the staff the ordinary B flat clarinet is provided with a hole beneath the pad  $C^3$  as hereinabove mentioned. In playing C sharp above the staff the pad  $C^3$  must be raised while for all lower notes it must be down. In my construction I mount said pad on a stem  $c^2$  extending from the rock shaft  $c^3$ . These parts are spring urged in such direction as to hold the pad  $C^3$  up. Extending from the stem  $c^2$  is a branch  $c^5$  underlying the stem of key A and another branch  $c^6$  underlying the key  $B^2$  as shown in Fig. 13. It will be seen that pad  $C^3$  will remain depressed when either one of the key for A or key  $B^2$  is depressed, as in the old system, but as a result of my construction the key for A and keys  $B^2$  and  $C^3$  are independently operable and yet the note C natural will be produced with proper pitch.

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

1. In an instrument of the class described,

the combination of pads controlling the notes B and C, a pad  $C^2$  near the pad for C, and a key 5 having arms overlying the pads for B and C, the pad for C being provided with an arm overlying the pad  $C^2$ .

2. In an instrument of the class described, the combination of the pads controlling the notes B and C, a pad  $C^2$ , a key 5, a rock shaft operated thereby, and adapted when depressed to close the pads for B and C and an arm rigidly connected to the pad for C and overlying the pad  $C^2$  whereby when said key is depressed the pads for B, C and  $C^2$  will be closed.

3. In an instrument of the class described, a pad for D# spring-influenced to rise, a spring actuated key 4 adapted to be played by the fourth finger of the right hand and having an arm normally holding said pad in closed position against the force of the latter's spring and an auxiliary key 6 adapted to be played by the fourth finger of the left hand and engaging said arm and adapted to remove it from engagement with said pad.

4. In an instrument of the class described, the pad for D# spring-influenced to remain open, the key 4 adapted to be played by the fourth finger of the right hand and having means for closing said pad against the influence of its spring and the auxiliary key 6 adapted to be played by the fourth finger of the left hand and adapted to remove key 4 from engagement with said pad.

5. In an instrument of the class described, the combination of the spring-opened pad for G#, the rock shaft  $g'$ , the arm  $g^2$  overlying said pad and the pad key for G, said pad key and arm being on opposite sides of the rock shaft  $g'$  and said rock shaft being spring-urged in a direction and with sufficient force to hold the pad for G# closed.

6. In an instrument of the class described, the combination of the pad for G# spring-urged to remain open, the pad-key for G spring-urged to remain open and provided with means for holding the pad for G# closed when the key for G is open, a member 15 spring-urged with sufficient force to hold said pad for G# closed, and means part of which is adjacent to the pad key for G so as to be operable from the same finger which operates the pad key for G for moving arm 15 to a position to release the pad for G#.

7. In an instrument of the class described, the combination of the pad for G# spring-urged to remain open, the pad key for G spring-urged to remain open and provided with means for holding the pad for G# closed when the pad key for G is open, a member 15 spring-urged with sufficient force to hold said pad for G# closed, an



arm 12 for operating arm 15 and a lug 13 on said arm lying adjacent to the pad key for G and operable from the same finger which operates said key whereby pad for G# may be automatically opened by a single finger pressing simultaneously upon the pad key for G and lug 13.

8. In a clarinet, the combination of the pad for G having a strong spring urging it to open position, the pad for G# having a weak spring urging it to open position, the arm  $q^2$  overlying the pad for G# and connected to the pad for G in such manner that when the pad for G is open the arm  $q^2$  will be down and thus hold the pad for G# closed, the lever 12 having a portion adapted to overlie the pad for G#, said lever having a spring strong enough to overcome the spring of the pad for G#, and the key 1 overlying the lever 12 on the opposite side of the fulcrum from the portion overlying the pad for G#.

9. In a clarinet, the combination of a key provided with a pad for closing the A hole, the pad for A# spring-urged to open,

means connected to said key normally holding the pad for A# closed against the force of the latter's spring, a spring urged member 16<sup>a</sup> also normally holding said pad for A# closed against the force of the latter's spring, and a member 19 connected to said member 16<sup>a</sup> for operating it, said member 19 being adjacent to said key, and adapted to be operated simultaneously therewith by the same finger of the operator.

10. In an instrument of the class described, the A pad key, the ring key B<sup>2</sup> above it, and the pad C<sup>3</sup> located between them, all three parts being independently movable, the pad C<sup>3</sup> having arms underlying said keys whereby when either of said keys is closed the pad C<sup>3</sup> will be closed.

In witness whereof, I have hereunto subscribed my name in the presence of two witnesses.

FRANCISCO RAMOS.

Witnesses:

HOWARD M. COX,  
C. J. CHRISTOFFEL.