

July 5, 1949.

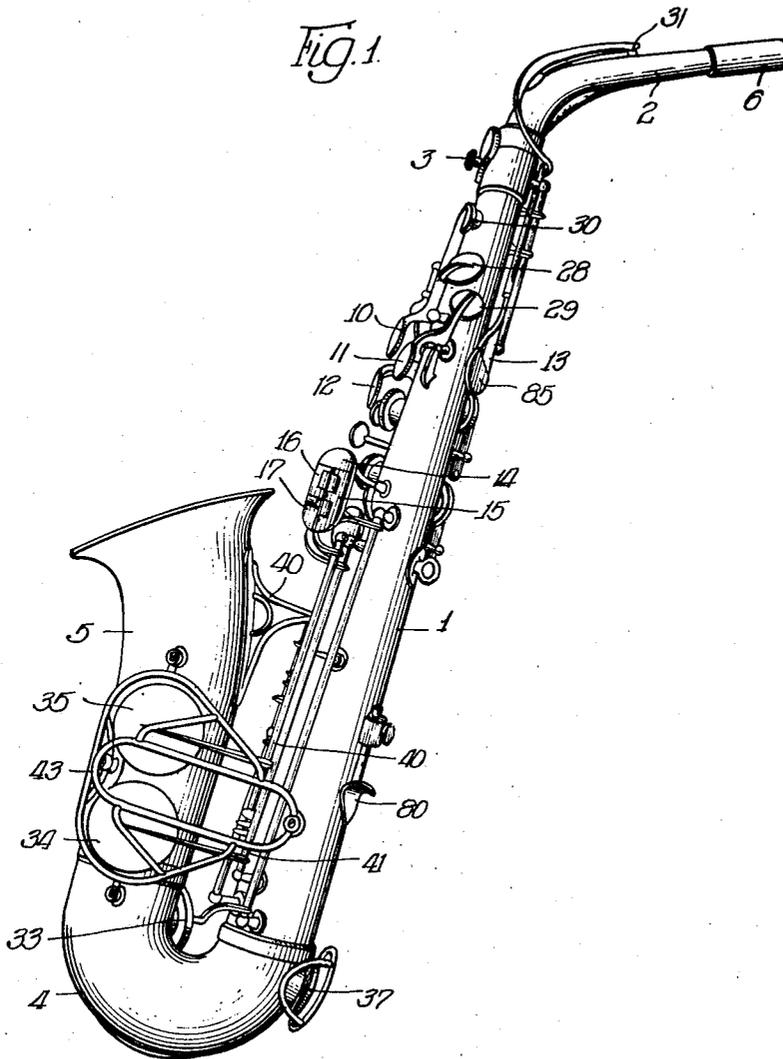
E. J. GILLESPIE

2,474,836

SAXOPHONE

Filed Sept. 29, 1945

4 Sheets-Sheet 1



INVENTOR.

Earl J. Gillespie,

BY

Brown, Jackson, Butcher & O'Connell

attys.

July 5, 1949.

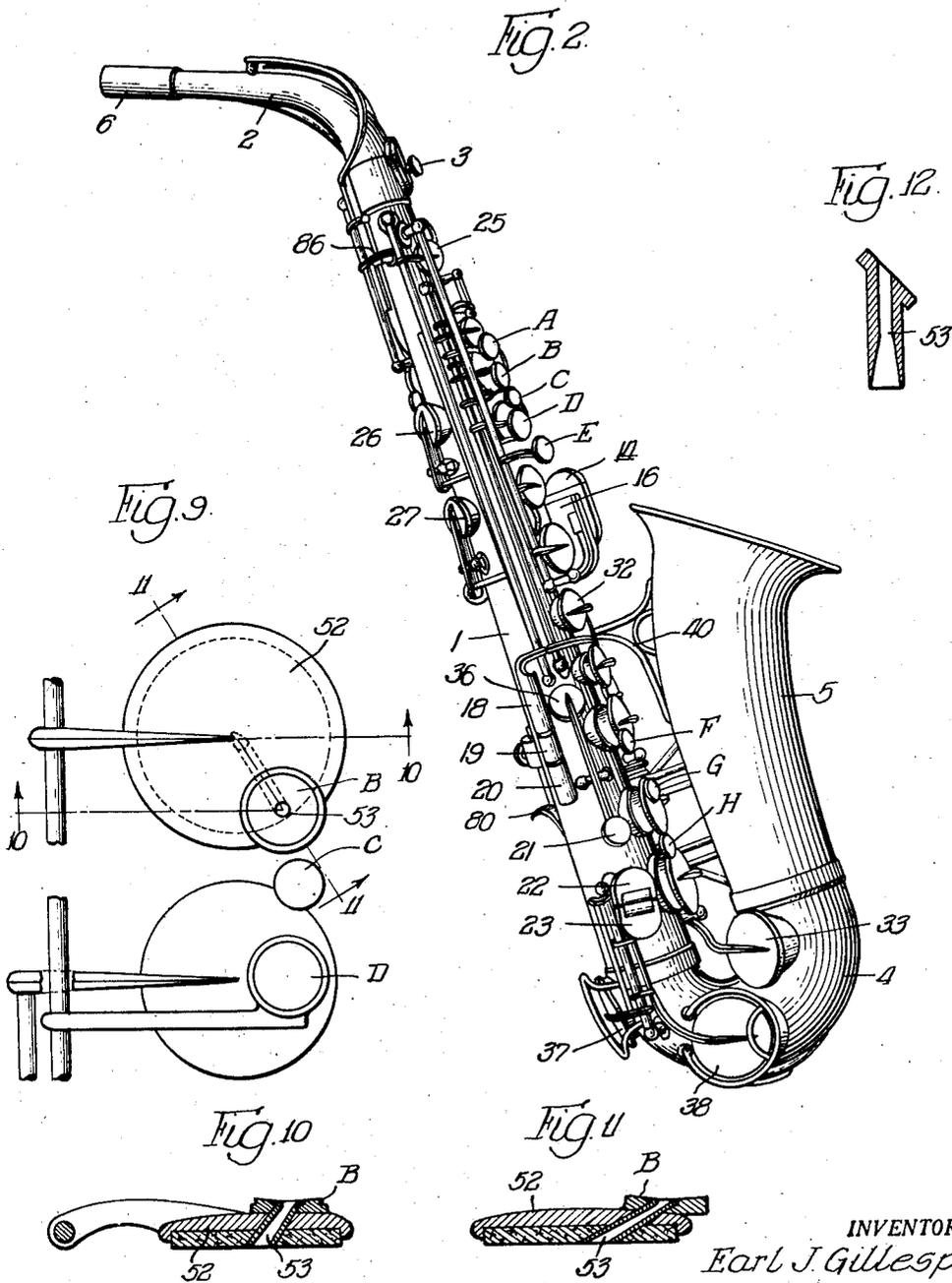
E. J. GILLESPIE

2,474,836

SAXOPHONE

Filed Sept. 29, 1945

4 Sheets-Sheet 2



INVENTOR.

Earl J. Gillespie,

BY

Crown, Jackson, Butcher & Dineen

Attys

July 5, 1949.

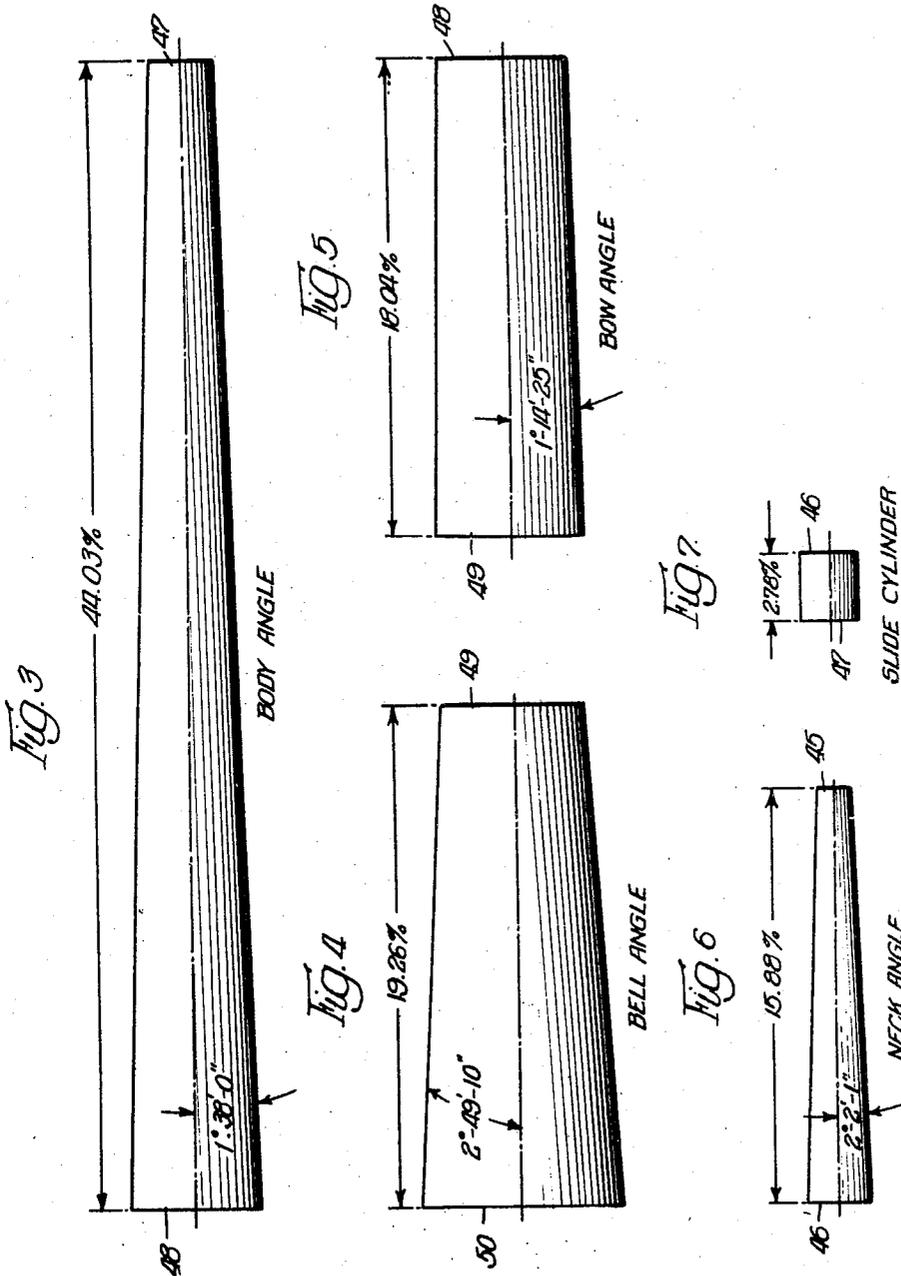
E. J. GILLESPIE

2,474,836

SAXOPHONE

Filed Sept. 29, 1945

4 Sheets-Sheet 3



INVENTOR.

Earl J. Gillespie,

BY

Brown, Jackson, Bittler & Dineen
[Signature]

July 5, 1949.

E. J. GILLESPIE

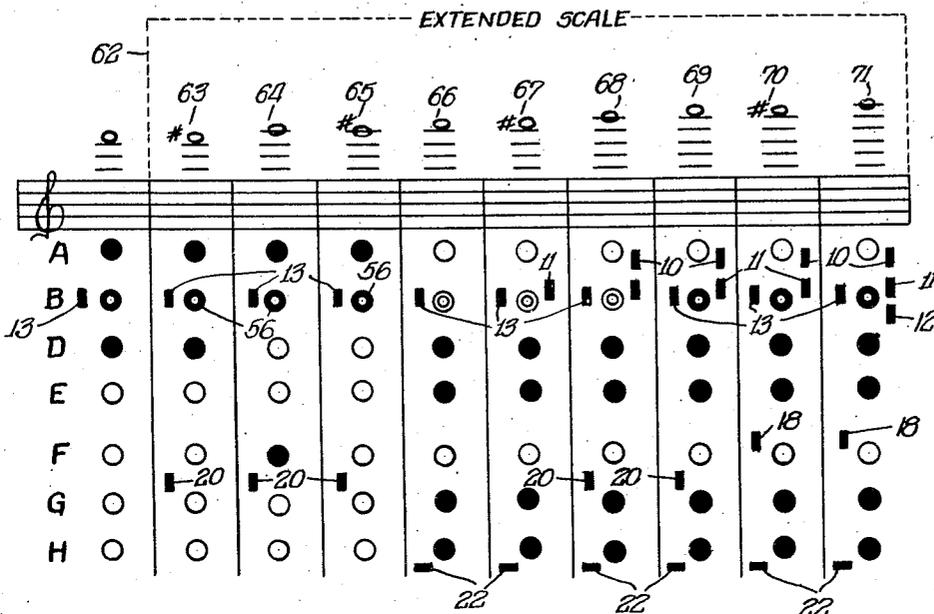
2,474,836

SAXOPHONE

Filed Sept. 29, 1945

4 Sheets-Sheet 4

Fig. 8



54 —■ KEYS

55 —○ FINGER PEARLS

56 —◎ SPECIAL VENT

57 —● BLACK DOT DENOTES PEARL CLOSED

58 —○ WHITE DOT DENOTES PEARL OPEN

59 —■ BLACK NUMBERED OBLONG DENOTES KEY DEPRESSED

60 —● BLACK DOT WHITE CENTER DENOTES VENT IN USE

61 —◎ WHITE DOT WHITE CENTER DENOTES VENT OPEN

INVENTOR.
Earl J. Gillespie,

BY

Conroy, Jackson, Britcher & Dixon
Attys.

UNITED STATES PATENT OFFICE

2,474,836

SAXOPHONE

Earl J. Gillespie, Elkhart, Ind.

Application September 29, 1945, Serial No. 619,378

8 Claims. (Cl. 84—385)

1

This invention relates, in general, to musical instruments, and has particular relation to improvements in saxophones.

As well understood in the art, a saxophone is a musical instrument comprising a tubular body of generally conical and more or less convoluted form sounded by a mouthpiece provided with a reed and having about twenty holes controlled by keys and pads. In the past, the field of use of such instruments was limited, but there have been improvements, and today saxophones are in use in symphonic, military, concert, and dance bands. The now generally known and accepted natural and usable range of the saxophone is still, however, more or less limited or restricted, extending at the upper limit to three line *f*.

One of the main objects of the present invention is to provide an improved saxophone which will provide new and advantageous results and eliminate limitations or restrictions previously presented.

Another object of the invention is to extend the now generally known and accepted natural and usable upper limits of a saxophone above the upper limits of the range heretofore provided and, more particularly, above three line *f*. The embodiment of the invention shown in the drawings extends the now generally known and accepted natural and usable upper limits of the saxophone nine consecutive chromatic semi-tones.

Another object of the invention is to provide means for securing the new and advantageous results which will be within mastery of the ordinary performer.

Another object of the invention is to form the tubular body of the saxophone with a taper and, more specifically, with different tapers along different portions thereof, as will hereinafter appear, with the angularity of the different tapers such and the tapers so correlated that the upper usable limits of the saxophone are extended above three line *f*, and, more particularly, nine consecutive chromatic semi-tones.

Another object of the invention is to provide means for securing the new and advantageous results without changing the existing accepted valves and fingering of the instrument for use in the regular register playing of the instrument.

Another object of the invention is to provide the tapered form of the tubular body in combination with an added air vent in the upper $\frac{1}{2}$ of the tubular body and keys and pads for use in the regular register fingering of the instrument whereby the new and advantageous results set forth are secured.

2

Further objects and advantages of the invention will appear from the following detailed description, taken in connection with the accompanying drawings which illustrate the manner of constructing and operating one form of saxophone embodying the present invention.

In the drawings:

Figure 1 is a perspective view of a saxophone embodying the present invention, taken from one side thereof;

Figure 2 is a perspective view of the saxophone shown in Figure 1, taken from the opposite side;

Figures 3, 4, 5, 6, and 7 show more or less diagrammatically the tapered portions which make up the tubular body of the saxophone;

Figure 8 is a fingering chart showing the extended scale secured with the saxophone shown in Figures 1 to 7, inclusive;

Figure 9 is a more or less diagrammatic elevational view showing one suitable location for the added or special air vent;

Figure 10 is a sectional view taken substantially on the line 10—10 of Figure 9;

Figure 11 is a sectional view taken substantially on the line 11—11 of Figure 9; and

Figure 12 is a detail sectional view of the added air vent member.

Referring now to the drawings, the invention is shown, for purposes of illustration, embodied in a saxophone which comprises a tubular body composed of the longitudinal tubular portion 1, the tubular neck 2, which is usually detachably fastened at 3 to the tubular portion 1, a bend 4, and a bell or flare 5 at the opposite end of the tubular portion 1. The tubular portion 1, bend 4, and the bell or flare 5 are firmly united, for example, by soldering or the like. The outer end of the neck 2 has a mouthpiece 6 which is provided with a suitable reed (not shown).

The instrument is provided with keys or finger pieces and valves or pads for use in the regular register fingering of the instrument. These are well understood in the art and will not be described in detail. Suffice it, for purposes of the present specification and to understand the fingering chart to be described in connection with Figure 8, to say that the instrument has keys 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, and 23, finger pieces A, C, D, E, F, G, and H, and a special or added air vent at the finger piece B. The special or added air vent may be otherwise disposed in any part of the upper one-third of the tube of the instrument within the scope of the present invention, for example, at the thumb piece 85. The key 18 controls valve or pad 25,

3

key 19 controls valve or pad 26, key 20 controls valve or pad 27, key 10 controls valve or pad 28, key 11 controls valve or pad 29, key 12 controls valve or pad 30, key 13 controls the octave valve or pad 31, also the lower octave valve or pad on the arm 86, key 14 controls valve or pad 32, key 15 controls valve or pad 33, key 16 controls valve or pad 34, key 17 controls valve or pad 35, key 21 controls valve or pad 36, key 22 controls valve or pad 37, and key 23 controls valve or pad 38.

In the saxophone illustrated in the drawing, the valves or pads 35, 34, 37, and 38 are the B-flat valve, B-natural valve, E-flat valve, and C valve, respectively. The key 14 is the key for the G-sharp valve or pad. The bell 5 is provided with a bell brace 40. The B-flat valve hinge is shown at 40', and the B-natural valve hinge is shown at 41 in Figure 1. An adjustable thumb rest is provided at 80.

The G-sharp valve control mechanism is similar to the G-sharp valve control mechanism more fully shown and described in my copending application Serial No. 579,325, filed February 23, 1945.

The octave valve control mechanism is similar to the octave valve control mechanism more fully shown and described in my copending application Serial No. 579,324, filed February 23, 1945, now U. S. Patent 2,425,796.

The B-flat valve 35 and B-natural valve 34 are preferably provided with a demountable valve guard 43 which is similar to the demountable valve guard more fully shown and described in my copending application Serial No. 579,323, filed February 23, 1945, now U. S. Patent 2,425,795.

The tubular body of the instrument has a tapering formation and, more particularly, different tapers along different portions thereof, with the angularity and lengths of the different tapers such, and the different tapered portions so correlated, that the upper usable limits of the saxophone are extended above the upper limits of the range heretofore provided and, more particularly, above three line *f*.

In the illustrated embodiment of the invention the tubular body starts at a given diameter at the upper end 45 (Figure 6) and continues lengthwise with an inside taper of approximately 2°-2'-2" to a point 46 approximately 15.89% of its entire length, from this point 46 (Figure 7) on cylindrically for 2.78% of its entire length to a point 47, from point 47 (Figure 3) with a taper of approximately 1°-38' for approximately 44.03% of its entire length to point 48, from point 48 (Figure 5) on with a taper of approximately 1°-14'-25" for approximately 18.04% of its entire length to point 49, and from point 49 (Figure 4) on with a taper of approximately 2°-49'-10" for approximately 19.26% of its entire length to point 50.

The bore of the tubular body fashioned in the manner above described progressively accumulates the cubical content and velocity of the air column within the tube so as to split the natural vibrations and amplify the sympathetic vibrations to produce nine consecutive chromatic semi-tones beyond the existing accepted upper limits of the saxophone, i. e., nine consecutive chromatic semi-tones above three line *f*, particularly in combination with the use of a vent placed in the tube in such manner as to release the sympathetic vibrations to produce a natural chromatic altissimo register not heretofore existing but easily playable with the present invention, extending to *d* in the four line octave.

4

As shown in Figures 9, 10, 11, and 12, the valve or pad 52 under the control of the special vent pearl B (Figure 2) has a special or added vent 53. This vent 53 is preferably located in the upper third of the tubular body of the instrument and, as already pointed out, releases the sympathetic vibrations to produce a natural chromatic altissimo register not heretofore existing but easily playable with this invention, extending to *d* in the four line octave.

Any saxophone completely embodying the principles of this invention will have a natural range of 41 consecutive chromatic semi-tones extending from B^b in the "great" octave to *d* in the four line octave inclusive.

As indicated by the legends and lettering on the fingering chart (Figure 8), the keys are indicated by small, generally oblong or rectangular figures 54, the finger pearls are indicated by white dots or circles 55, and the special or added vent is indicated by a white circle or white dot 56 with a white center or white circle therein. A black dot 57 denotes pearl closed, a white dot or circle 58 denotes pearl open, a black oblong 59 denotes a key depressed, a black dot with white center, as shown at 60, denotes vent in use, and a white circle or dot with white center or circle therein, as shown at 61, denotes vent open.

In the fingering chart (Figure 8) the extended scale provided by the saxophone embodying the present invention is bracketed or indicated by dotted lines 62 marked "Extended scale." The first extended chromatic semi-tone is indicated at 63, the second extended chromatic semi-tone is indicated at 64, the third extended chromatic semi-tone is indicated at 65, the fourth extended chromatic semi-tone is indicated at 66, the fifth extended chromatic semi-tone is indicated at 67, the sixth extended chromatic semi-tone is indicated at 68, the seventh extended chromatic semi-tone is indicated at 69, the eighth extended chromatic semi-tone is indicated at 70, and the ninth extended chromatic semi-tone is indicated at 71.

The first added chromatic semi-tone is obtained with pearl A closed, key 13 depressed, the special or added vent, 56, 53 in use, pearl D closed, and key 20 depressed.

The second added chromatic semi-tone is obtained with pearl A closed, key 13 depressed, the special or added vent 56, 53 in use, pearl F closed, and key 20 depressed.

The third added chromatic semi-tone is obtained with pearl A closed, key 13 depressed, the special or added vent 56, 53 in use, and key 20 depressed.

The fourth added chromatic semi-tone is obtained with key 13 depressed, the special or added vent 56, 53 open, pearls D, E, G, and H closed, and key 22 depressed.

The fifth added chromatic semi-tone is obtained with the special or added vent open, keys 13 and 11 depressed, pearls D, E, G, and H closed, and key 22 depressed.

The sixth added chromatic semi-tone is obtained with keys 10, 13, 11, 20, and 22 depressed, the special or added vent open, and pearls D, E, G, and H closed.

The seventh added chromatic semi-tone is obtained with keys 10, 13, 11, 20, and 22 depressed, the special or added vent in use, and pearls D, E, G, and H closed.

The eighth added chromatic semi-tone is obtained with keys 10, 13, 11, 18, and 22 depressed,

the special or added vent in use, and pearls D, E, G, and H closed.

The ninth added chromatic semi-tone is obtained with keys 10, 11, 12, 13, 18, and 22 depressed, the special or added vent in use, and pearls D, E, G, and H closed.

The embodiment of the invention shown in the drawings is for illustrative purposes only, and it is to be expressly understood that said drawings and the accompanying specification are not to be construed as a definition of the limits or scope of the invention, reference being had to the appended claims for that purpose.

I claim:

1. A saxophone comprising a tubular body having an upper octave hole and an added vent positioned inwardly of the upper octave hole and provided with keys and pads for use in the regular register fingering of the instrument, said tubular body having a plurality of sections each having a different individual taper whereby the upper usable limits of the saxophone are extended above three line *f* by the use of the keys and pads used in the regular register fingering of the instrument.

2. A saxophone comprising a tubular body having an upper octave hole and an added vent positioned inwardly of said upper octave hole and provided with keys and pads for use in the regular register fingering of the instrument, said tubular body having a plurality of different individually tapered sections along different portions thereof, the angularity of said different tapers being such and the tapers so correlated that the upper usable limits of the saxophone are extended above three line *f* by the use of the keys and pads used in the regular register fingering of the instrument.

3. A saxophone comprising a tubular body having an upper octave hole and an added vent in the upper $\frac{1}{3}$ of the tubular body and inwardly of the upper octave hole and provided with keys and pads for use in the regular register fingering of the instrument, said tubular body having a plurality of sections each having a different individual taper whereby the upper usable limits of the saxophone are extended nine consecutive chromatic semi-tones by the use of the keys and pads used in the regular register fingering of the instrument.

4. A saxophone comprising a tubular body having an upper octave hole and an added vent in the upper $\frac{1}{3}$ of the tubular body and inwardly of the upper octave hole and provided with keys and pads for use in the regular register fingering of the instrument, said tubular body having a plurality of different individually tapered sections along different portions thereof, the angularity of said different tapers being such and the tapers so correlated that the upper usable limits of the saxophone are extended nine consecutive chromatic semi-tones by the use of the keys and pads used in the regular register fingering of the instrument.

5. A saxophone comprising a tubular body having an upper octave hole and an added vent posi-

tioned inwardly of said upper octave hole, said tubular body having its bore fashioned of individually tapered sections with the taper of one section different from the taper of a succeeding or preceding section to accumulate the cubical content and velocity of the air column within the tubular body whereby to split the natural vibrations and amplify the sympathetic vibrations to extend the upper usable limits of the saxophone above three line *f*.

6. A saxophone comprising a tubular body starting at a given diameter at the upper end and continuing lengthwise with an inside taper of approximately 2°-2'-1" to a point approximately 15.89% of its entire length, from this point on cylindrically for 2.78% of its entire length, from this point on with a taper of 1°-38' for approximately 44.03% of its entire length, from this point on with a taper of approximately 1°-14'-25" for approximately 18.04% of its entire length, and from this point on with a taper of approximately 2°-49'-10" for approximately 19.26% of its entire length.

7. A saxophone comprising a tubular body and provided with keys and pads for use in the regular register fingering of the instrument, said tubular body starting at a given diameter at the upper end continuing lengthwise with an inside taper of approximately 2°-2'-1" to a point approximately 15.89% of its entire length, from this point on cylindrically for 2.78% of its entire length, from this point on with a taper of 1°-38' for approximately 44.03% of its entire length, from this point on with a taper of approximately 1°-14'-25" for approximately 18.04% of its entire length, and from this point on with a taper of approximately 2°-49'-10" for approximately 19.26% of its entire length.

8. A saxophone comprising a tubular body provided with an air vent in the upper $\frac{1}{3}$ of the tubular body and having keys and pads for use in the regular register fingering of the instrument, said tubular body starting at a given diameter at the upper end and continuing lengthwise with an inside taper of approximately 2°-2'-1" to a point approximately 15.89% of its entire length, from this point on cylindrically for 2.78% of its entire length, from this point on with a taper of 1°-38' for approximately 44.03% of its entire length, from this point on with a taper of approximately 1°-14'-25" for approximately 18.04% of its entire length, and from this point on with a taper of approximately 2°-49'-10" for approximately 19.25% of its entire length.

EARL J. GILLESPIE.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,480,039	Alpers	Jan. 8, 1924
1,703,109	Johnson	Feb. 26, 1929
2,051,176	Powell	Aug. 18, 1936
2,133,625	Loomis	Oct. 18, 1938