

instrument (all the upper holes are closed as usual) will be that one which corresponds to the cup 24 by which lower C is sounded. The head 22 is therefore termed

5 head or key of lower C.

On the contrary by pressing solely on the head 20, the cup 19 will be depressed on to its hole, which consequently will be closed, so that the hole whence the note will issue will be the one corresponding to the cup 27, that is the hole of C sharp. The head 20 therefore receives the name of cup or key of C sharp. This arrangement differs from the corresponding mechanism of saxophones in use by the fact that in these latter, when the head 20 is pressed, producing the closure of the cup 19, it is the note lower C which is sounded, for the first hole open on the instrument is that of lower C instead of that of lower C sharp as aforesaid.

Figs. 7 and 8 show the mechanisms for obtaining the B flat by the forefinger of the left hand.

25 The key, instead of being in one piece as customary, is jointed; the hole giving the B flat is stopped by a cup 44 soldered to the end of a lever arm 45 movable about a spindle 46, the opposite end 47 of the lever 45 is located below a connecting piece 48 attached to the key barrel 49, to which is soldered the lever arm carrying the plate or cup 50 closing the C hole; a needle spring 51 located under the key barrel 49 keeps the cup 50 raised as usual.

30 A blade spring 45<sup>1</sup> located under the lever 45 tends to cause the depression of the cup 44 on to its hole when the connecting piece 48 operated by the cup 50 is raised, that is to say the cup 50 being depressed to close the C hole. It will be understood therefore that when the C hole is closed by the cup 50, the cup 44 will simultaneously close the B flat hole.

45 The cup 50 being depressed, it will however be possible to raise the cup 44 by operating upon the end 54 of a lever arm 52 pivoted at 53, the opposite end of which operates below a connecting piece 55 soldered on the cup 44. It is also clear that by ceasing to operate upon the cup 50 the connecting piece 48 will operate upon the lever arm 45 and by allowing this latter to rock about the pivot 46 in opposition to the action of the spring 45<sup>1</sup> will consequently raise the cup 44 so as to allow the emission of the hole by the unblocked hole.

60 The cup closing the upper D hole is shown at 56 in Figs. 7 and 8; it is located at the end of a key attached to a lever 57 attached to the key barrel 58. The end 59 of the lever 57 opposite to the key attached to the cup 56, which lever is suitably cranked to meet the requirements

of its position and operation, passes under the connecting piece 48 operating upon the end 47 of the lever 45 carrying the cup 44 of B flat, and rests upon two connecting pieces 60 and 61, one of which 70 60 is attached to the key barrel 49 carrying the C key 50, and the other 61 is attached to the key barrel 63 of the cup 62 of B flat.

The cup 56 is held closed normally by a connecting piece 64 operating upon the lever 57 near the key, and attached to a key barrel 65 operated by a head 66 or by the attached arm 98 (Fig. 10). To the key barrel 65 is also attached a connecting piece 67 operating upon a cup 68, of C sharp (Figs. 7 and 10).

When the head 66 or the arm 98 is operated upon the key barrel 65 by pivoting raises the connecting piece 64, which allows the cup 56 to rise under the action of a spring 69 and consequently to uncover the upper D hole. Simultaneously the connecting piece 67 operating upon the cup 68 depresses it upon its hole.

The cup 56 being raised, its depression can be effected in two ways whilst still continuing to operate upon the head 66 thus ensuring the closure of the cup 68 by the connecting piece 67:—

Firstly by operating upon the cup 50 closing the C hole, which, at the same time as it brings about the closing of the B flat hole by the cup 44, as aforesaid, also operates through the connecting piece 60 attached to the key barrel 49 and raises the end 59 of the lever 57 which pivoting about the key barrel 58 closes the upper D hole by the cup 56.

Secondly by operating upon the plate 62 attached to the key barrel 63, to which is also attached the connecting piece 61, the raising of which causes the lever 57 to rock about its key barrel 58.

Upon the key barrel 65, which operates the C sharp hole 68 by means of the head 66 there is attached, either directly on the key barrel or under the head 66, a lever arm 98 which abuts under a catch 99 constituting part of the cup 94 of F sharp, so that the depression of this cup 94 of F sharp, which abuts by its catch 99 on the arm 98, closes the C sharp hole 68 (Fig. 10).

It is also to be clearly understood that all the motions of raising and depressing of the cups all comprise needles constituting springs, one end of which is fixed either in a knob constituting a support for the spindles on which the key barrels turn, or on the body of the instrument, whilst the opposite end is held in a notch made in a small boss on the key barrel in question.

Finally in Fig. 9 there is shown an

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