from removing her husband from his place as a reigning prince. In 1807 Saxe-Weimar-Eisenach entered the Confederation of the Rhine and in the subsequent campaigns it suffered greatly. The Congress of Vienna in 1815 added about 660 sq. m. to its area and gave its ruler the title of grand-duke. Just after the conclusion of peace Charles Augustus gave a liberal constitution to his land; freedom of the press was also granted, but after the festival of the Wartburg on the 18th of October 1817 this was seriously curtailed. The next grand-duke, Charles Frederick, who succeeded in 1828, continued his father’s work, but his reforms were not thorough enough nor rapid enough to avert disturbances in 1848, when power was given to a popular ministry and numerous reforms were carried through. Reaction set in under Charles Alexander, who became grand-duke in 1853, and the union of the crown lands and the state lands was undone, although both remained under the same public manage­ment. In 1866 the grand-duchy joined Prussia against Austria, although its troops were then garrisoning towns in the interests of the latter power; afterwards it entered the North German Confederation and the new German empire. Charles Alexander died in January 1901 and was succeeded by his grandson William Ernest (b. 1876).

See C. Kronfeld, *Landeskunde des Grossherzogtums Sachsen- Weimar-Eisenach* (Weimar, 1878-1879); and the official *Staats­handbuch für das Grossherzogtum Sachsen* (Weimar, 1904).

SAXHORN, the generic name of a family of brass wind instruments (not horns but valve-bugles) with cup-shaped mouthpieces, invented by Adolphe Sax and in use chiefly in French and Belgian military bands and in small wind-bands. The saxhorns came into being in 1843, when Sax applied a modification of the valve system invented in Germany in 1815 to the keyed bugle. The saxhorn consists of a conical tube of a calibre greater than that of French horn and trumpet, but smaller than that of the tubas or bombardons, and capable therefore of producing by overblowing the members of the harmonic series from the 2nd to the 8th, in common with the cornets, bugles, valve-trombones and the Wagner tubas. The

saxhorns are furnished with

three valves, by means of which

the compass is rendered chromatic, and which act as in other valve instruments, lowering the pitch of the instrument when depressed, respectively 1 tone, a semitone and 1½ tones ; and further, when used in combination, 2 tones, 2½ tones and 3 tones. The Flügelhorns, the euphonium, the bombardon and the tubas are sometimes erroneously classed as saxhorns. The difference between saxhorns and bombardons or tubas consists in the calibre of the bore, which in the latter is sufficiently wide in proportion to the length to produce the fundamental note of the harmonic series an octave below the lowest note of the saxhorns. The consequence of this structural difference is important, for whereas the tube of the tubas is theoretically of the same length as an open organ pipe of the same pitch, the saxhorns require a tube twice that length to produce the same scale. For instance, a euphonium sounding 8 ft. C only needs a tube 8 ft. long, whereas the corresponding bass saxhorn requires one 16 ft. long. In Germany these structural differences have given rise to a classification of brass wind instruments as *whole* or *half* instruments (*Ganze* or *Halbe),@@*1 according to whether the whole or only the half of the length of tubing is of practical use. The members of the saxhorn family are the small saxhorn in E♭, the soprano in B♭, the alto in E♭, the tenor in B♭, the bass in B♭ (an octave lower), the low bass in E♭, the contra- bass in B♭, three octaves below the soprano. All the saxhorns are treated as transposing instruments.@@2 A similar family, con- structed with rotary valves and conical tubes of larger calibre than the saxhorns, but having the same harmonic scale, is known in Germany as Flügelhorn. (K. S.)

SAXIFRAGACEAE, in botany, a small natural order of Dicotyledons belonging to the sub-class Polypetalae and con­taining 27 genera with about 350 species distributed through the Arctic and north temperate zone, often alpine. It is repre­sented in Britain by its largest genus *Saxifrage (q.v.), Chryso­splenium* (golden saxifrage) and *Parnassia* (grass of Parnassus). The plants are herbs, generally with scattered exstipulate leaves with a broad leaf-base. The small flowers are generally arranged in cymose inflorescences and are

bisexual, regular and hypogynous,

perigynous or more frequently more

or less epigynous, this variation in

the relative position of the ovary

occurring in one and the same genus

*Saxifraga* (fig. 1). The flowers are

5-merous, more rarely 4-merous,

having 5 (or 4) sepals, 5 (or 4) free

petals, two 5- or 4-merous whorls of

free stamens which are obdiploste-

monous, *i.e.* those of the outer whorl

are opposite to the petals, and two

carpels (see fig. 2). The carpels are sometimes free, more generally united at the base, or sometimes completely joined to form a one- or two-chambered ovary with two free styles. The fruit is a many-seeded capsule.

More than half the species (200) are contained in the genus *Saxi­frage* (*q.v.*). *Chrysosplenium,* with 39 species, two of Which are British,

. @@@1 See Dr Emil Schafhäutl's article on musical instruments in sect. iv. of *Bericht der Beurteilungscommission bei der allg. deutschen Industrieausstellung,* 1854 (Munich, 1855), pp. 169-170.

@@@2 Georges Kastner, in *Manuel général de musique militaire* (Paris, 1848), gives full information on the saxhorns, pp. 230 et seq., 246-247, and Pls. xxii. and xxiii.