and then raised or lowered into position. Again, at Munich, a scheme of turn-tables based on the Japanese revolving stage was put forward, but this can only be looked upon as an in­teresting experiment of little practical value.

Numerous methods of illuminating the stage have similarly been attempted, with the aid of search-lights, and proscenium­lights, or by the absence of foot-lights, and the like, but the general method of lighting the stage from the top with battens, from the side with wing-ladders, and from below with foot-lights, if carefully regulated and skilfully handled, produces excellent results. The lighting arrangements as practised at the Royal Opera House, Covent Garden, in which building the lighting engineer is Mr Crawshaw and the consulting engineer for the lighting installation was Mr Bowles, leave nothing to be desired from an artist’s point of view. The great difficulty of the light coming too strongly from below, *i.e.* from the foot-lights, can be overcome by the regulation and colouring of the lights.

As examples of modern mechanism, two photo­graphs have been reproduced showing views of the electrical stage "bridges ” of the Royal Opera House, Covent Garden, and of the Theatre Royal, Drury Lane, respectively, both on the Sachs system (see PL III.). A small general plan and section of the Covent Garden stage are also shown (see fig. 6), and another illustration (see PL IV.) presents the "gridiron” at Covent Garden on the Brandt system.

The following is a detailed description of the Covent Garden installation.

The stage may be described as consisting of a series of six horizontal sections running parallel with the curtain line from front to back, each section being 8 ft. wide, and the whole being followed by a large back or rear stage. The first section contains nothing but a plain "carpet cut," and openings to take the old-fashioned "grave" trap, "star” trap, or other similar contriv­ances. The second and third sections comprise large bridges, which can be raised 6 ft. above the stage or lowered 8 ft. below the stage, constructed in two levels, on the lower level of which appliances can be installed for the purpose of raising minor platforms above stage level or sinking traps and the like. The fourth, fifth and sixth sections comprise large bridges running right across the stage front, which can be raised 9 ft. above the stage or lowered 8 ft. below it. The back stage has no openings or mechanism beyond certain trap-doors to a scenery store, and the necessary electrical mechanism for raising and lowering scenery for storage purposes. Between the various sections of the stage, long longi­tudinal flaps, 2 ft. wide, have been formed, which can be easily opened to allow scenery to be passed through below for transformation scenes and the like. Each section is equipped with what is termed a pair of chariots, to hold "wing” lights placed on so-called wing ladders. All the electrical bridges are worked from the "mezzanine" level and from ordinary switch­boards, and can be raised and lowered at various speeds, and take loads up to 2 tons. They can be moved without vibration or noise at a cost of about ¼d. for power on a full rise when loaded.

Above the stage level each section has its series of lines to take cloths, borders, &c. Each section has a batten, from which the electric battens are suspended, and has also a large wooden lattice girder, from which heavy pieces of scenery can be hung. There are, on the average, about ten lines for ordinary battens, a girder batten, and a light batten to each section; besides these lines, there are the equipments of flying apparatus and the like, whilst in front there are, of course, the necessary lines for tableaux curtains, act-drops and draperies. Everything that is suspended from above can be worked at stage level or at either of the gallery levels, every scene being counter-weighted to a nicety, so that one man can easily handle it. No mechanical contrivance is required, and in practice quite a number of scenes can be rapidly changed in a very short time. . Throughout the structure and mechanism steel has been used, with iron pulleys and wire cable; and the inflam­mable materials have been absolutely reduced to the flooring of the gridiron and galleries and the hardwood flooring of the stage and mezzanine. In other words, an absolute minimum of inflam­mable material replaces what was almost a maximum ; and seeing

that the electric light has been installed, the risk of an outbreak of fire or its spread has been materially reduced.

No mention of stage mechanism would be complete unless mention were made of the necessity of providing a carefully made and easily worked fire-resisting curtain of substantial but light con­struction. On the Continent metal curtains are favoured. In England the double asbestos curtain is more common. The London County Council prefer a steel framing with asbestos wire-wove cloth on both faces, the intervening space being filled with slag wool, well rammed and packed. Such curtains are somewhat

heavy and require counter-weighting to a nicety, but if well made and fitted may be deemed satisfactory. It is advisable to fit drenchers above fire-resisting curtains and to so arrange the working of the curtain that it can be lowered from four points, *i.e.* from both sides of the stage, from the prompt side flies and from the stage door.. According to the Lord Chamberlain’s rules, fire resisting curtains must be lowered once during a performance. This is a wise measure for testing the efficiency of the appliances.

Authorities.—*Modern Opera Houses and Theatres*, 3 vols. grand folio, by Edwin O. Sachs (1896-99); *Stage Construction,* 1 vol. grand folio, by Edwin O. Sachs (1896); "*Engineering Articles on Stage Mechanism,* by Edwin O. Sachs (1895-97); *Fires and Public Entertainments,* 1 vol. quarto, by Edwin O. Sachs (1897); *Le Théâtre,* 1 vol. oct., by Charles Garnier (1871); *Les Theatres*