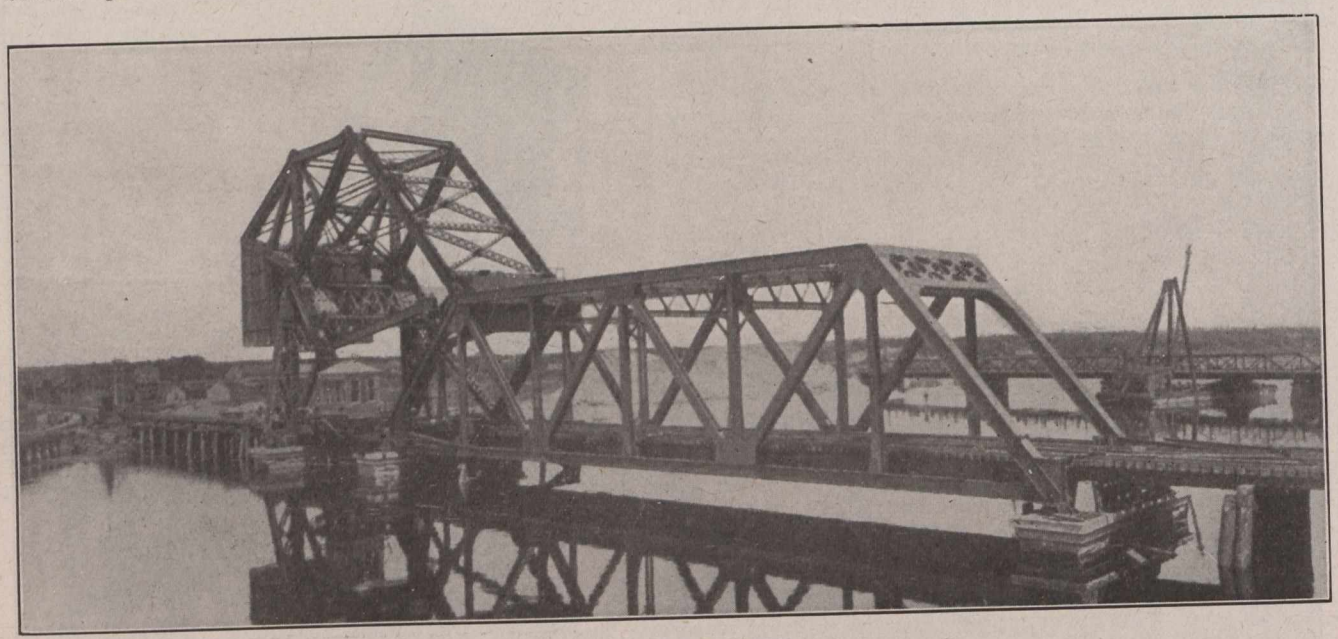
Metropolitan Elevated Railway bridge located beside it. A large percentage of the bascule bridges that have been built have been equipped with electric motors and controlling devices.

Advantages of Electrical Operation

For the amount of horse-power developed, the electric motor is light and compact, and is conveniently reversed, running equally well in either direction. It has no reciprocating parts, and therefore the mechanical wear and internal friction are almost negligible quantities. It is capable of sustaining a heavy overload for short periods, which enables is to take care of the very difficult problem of accelerating a heavy mass and also of operating the bridge against high wind pressures that may occasionally be experienced. It is almost noiseless in operation. Being compact, it can be located close to the point where the power must be used, thus obviating the necessity of having a large engine room with a heavy floor system above the deck of either the swing or bascule span. This makes it possible to locate the bridge operator at the most convenient position from the standpoint of accessibility, or where the best view can be obtained of the river or railway or highway traffic. The motors can be located on a moving portion of the structure while the operator's house is located on the fixed part. This is one reason why the electric motor has been so important a feature in the development of the bascule bridge, as on a number of present designs the leaf motors as well as the motors operating the locks at the extreme point of the bridge, move with the leaf through its entire angular range of motion. Connection can readily be made between the moving and fixed portions of the bridge by means of swinging loops, flexible joints or commutating devices. The electric motor, furthermore, at at present designed and constructed, requires comparatively little attention, and the possibility of its getting out of order and refusing to do its work is very remote where periodical inspection is given.

Standard Electrical Equipment.

The modern bascule bridge requires one or two motors for the operation of the moving leaf, a motor for the front lock, and in some cases a motor for the rail locks. Frequently, moving rail locks are omitted and the end locks are operated by hand power. Each of these motors is ordinarily provided with a solenoid brake and the motors operating the end lock and rail lock are automatically stopped by the current being cut off and the brake being applied when the lock in its travel reaches the end of its motion in either direction. The current is ordinarily cut off from the leaf motors and the brakes applied when the leaf in opening reaches a point beyond which it is dangerous to allow it to travel. The controllers for the operation of the several motors are located in the operator's house conveniently situated, and a switchboard is provided carrying the necessary instruments, switches and circuit breakers or contactors. The motion of the leaf is under the control of the operator at all times except when it reaches the danger point in opening, when the automatic stop acts. The motors for the end locks and rail locks are ordinarily started in the proper direction and run continuously until automatically stopped by the action of the contact switches, which cause the rupturing of the motor circuit at the switchboard. The positions of the bridge leaf and locks are shown to the operator by indicator lights conveniently grouped in front of the controller.



Strauss Bascule Bridge.

Owing to the fact that all the motors are on the moving leaf, it is not usually found feasible to install a mechanical brake, and in order to avoid the possibility of disastrous results attending the failure of the motor brakes to hold the leaf it is customary to install what is called an emergency brake, which will be applied automatically in case the current fails, or may be applied by the operator if desired. This brake is set by springs and ordinarily pulled into release before starting the bridge, and is applied again after the swing is made, not being used as a service brake unless the emergency conditions arise. An electric solenoid has frequently been used for releasing this brake, but a better method has been found in the use of a small electric motor operating a mechanism for releasing the brake, and holding it in release as long as the current is held on the motor. Rupturing the circuit by the operator, or by the loss of current on the line, automatically trips a release and insures instantaneous application of the brake without waiting for the mechanism to go through the reverse motion corresponding to that in releasing. This arrangement is