apparatus is automatic. In fact the part of the cylinder D comprised between the bottom and the piston N communicates by openings p (which are never covered with the escape-tube of the gas), in such a manner that upon its posterior face the piston N receives the pressure of the gas at the moment when it flows, a pressure which it is sought to render constant. The piston E receives on its anterior face the action of the spring which can be regulated at pleasure. As to the other faces of the two pistons, they are subjected to equal actions proceeding from the pressure of the gas at its entry, actions which thus counteract each other; so that the forces which determine the position of the movable system are, on the one hand, the tension of the spring, a constant and determined force, and, on the other hand, the pressure of the flowing gas; and thus equilibrium cannot occur unless the two forces are equal. If the gas should flow in too great a quantity, the pressure increases on the posterior face of the piston N, the spring is overcome, and the movable system advances a little toward the left; but then the orifices are partly covered and the flow diminishes. If the pressure then becomes too weak at the exit, the spring in its turn prevails, pushes the sheath toward the right, uncovers the orifices, and consequently a greater quantity of air may enter.

The machines which are now used at the St. Gothard Tunnel, genuine compressed-air locomotives, are furnished with M. Ribourt's apparatus. They consist of the following parts: A sheet-iron reservoir to contain the compressed air is mounted on a framework quite like that of steam-locomotives, and carrying glasses, cylinders, distributing apparatus, etc. The tube for receiving the air possesses, within reach of the driver, the automatic valve of M. Ribourt. The screw being easily regulated, the air can with certainty be made to issue from the apparatus at a determined pressure. This air then passes into a small reservoir (about one-third metre cube), intended to deaden the shocks, which are always produced when the machine is set agoing or stopped. Lastly, this small reservoir communicates with the cylinders, and the air which reaches them acts in the same manner as steam in ordinary locomotives.

The pressure in the principal reservoir at the point of exit depends on the power of the compressing apparatus; at St. Gothard it may attain fourteen kilogrammes per square centimetre, but is ordinarily about 7.35 kilogrammes. The pressure in the small reservoir is arbitrary, depending on the regulation of the screw; at St. Gothard it has a mean of 4.20 kilogrammes. The entire machine weighs about seven tons.—*Nature.*