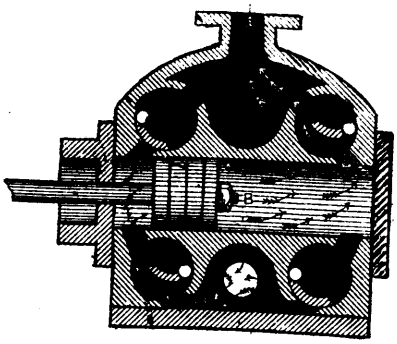

FIG. 2.
Section through Cylinder.

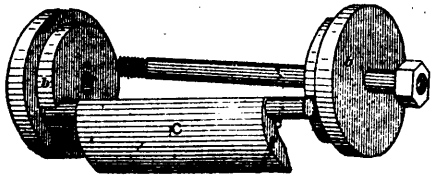

FIG. 4
Details of Valves.

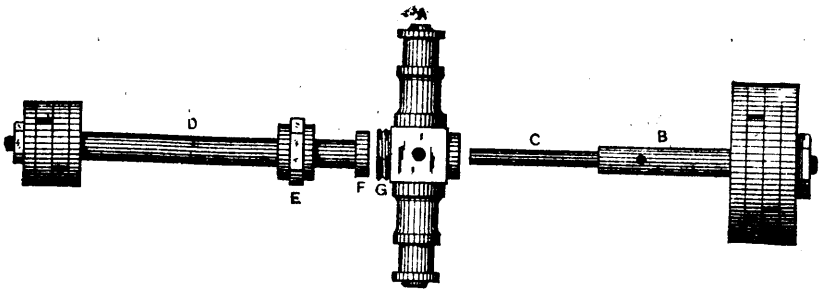

FIG. 3.
Detached Piston Rod.

guide in each cap, with external nuts on each end of bolt, and this bolt limits the extreme lift of valve. The faces of the valves are made true to the same radius as the inner surfaces of the cylinders and are accurately fitted, while the valve pivots are turned to exactly fill the slots in the caps. These valves fall on their seats of their own weight, and, being circular on the faces, evenly and gradually bed themselves, so that no composition in the seats or valves is necessary and springs, etc., are dispensed with. The wear of these valves is very small. Dirt cannot lodge on the seats, and large objects or impediments, such as fish, rags, etc., are cut, and any hard matter large enough to pass through the ports goes through without injury to the parts, or is removed by the swinging motion of the valve. The working of this form of valve increases the tightness, and they are thus made capable of forming an almost perfect vacuum in the suction-pipe. This pump, we are informed, can pump molasses, mashes of any kind, glue or anything that can be made to move.

An ingenious arrangement of piston rods is used when power is transmitted from the fly-wheels of these pumps. In Fig. 3, *B C* is the main steam piston-rod, the end *C* being turned to small diameter so as to fit within the hollow part of the water cylinder piston-rod *D*. The dotted lines denote the hollow, which acts as a guide for the rod *B C*. The nut *E* passes on to shoulder *F*, which nut is screwed to thread *G* on cross-head *A*. When the pump is to deliver water this nut is detached, when power only is needed and the water piston remains at rest. These pumps are used for power engines in a number of instances, and we are informed give satisfaction, and for fire pumps or where a high pressure and rapid flow is required they are very efficient.—*American Engineer.*

THE DANGER OF ELECTRIC DISTRIBUTION.

Notwithstanding the susceptibility of the public mind to suggestions of alarm, it is doubtful if a full realization of the risk to which the members of the community are exposed from electric wires has been generally attained. If the recent law providing for death by electricity as the punishment of murderers never goes into effect, it will doubtless do its meed of good. It will cause a more thorough discussion of the subject in technical circles, and the idea and true conception of the danger will be disseminated among all.

Electric companies, whether supplying current for lamps or motors, have every inducement to increase the danger inevitably attendant upon their installations. The cheapest wire is the uncoated one. A wire however poorly insulated costs more; a properly insulated one is still more expensive. The quality of the insulation at the start is only one element—its duration when exposed to the weather is another.. Insuring the latter gives a further increase in cost. As the network of wires grows thicker, and as the lines cross each other more often, an additional cause of deterioration appears. The contact of swinging wires with one another tends to rub off the insulation and expose the metal. The lines which have done the damage then serve as conductors to carry off the current, possibly to a telephone box or other place where it may do much harm.

Recent experiments in death by electricity which have been made upon animals illustrate the fatal nature of the dynamic shock. In the early days of the science, the static discharge of immense potential and very small quantity was considered the most fatal. It corresponded to the lightning stroke, both in its electrical characteristics and effects. Following the devel-