

The construction and operation of this machine cannot be clearly described without engravings.

An improved rub-iron for car trucks has been patented by Mr. David E. Small, of York, Pa. The object of this invention is to provide an ordinary car truck with an improved rub-iron which will adapt the truck to carry either wide or narrow car bodies, or such bodies as are used upon broad or narrow gauge roads, so that the car body, with its cargo, may be transferred from the truck of a wide gauge to the truck of a narrow gauge road.

**Volcanic Thunder Storms.**

A paper on volcanic thunder storms, by M. Faye, was read before the French Academy of Sciences, on November 2. It is stated that in paroxysmal eruptions the enormous amount of steam ejected causes volcanic thunder storms, which are very different from ordinary thunder storms. The volcanic storm has no gyratory movement; it is confined to the column of ascending clouds, and no flashes occur without the presence of ashes. Altogether, the phenomena resemble very closely those of the Armstrong electric machine. As observers have failed to mention any hail attending these thunder storms, it is probably because no hail is formed. Its absence is due, M. Faye thinks, to the lack of gyratory motion already noticed.

**TIDAL OUTLETS FOR SEWERS.**

On this page we show a plan from Mr. Rawlinson's "Suggestions" for a main sewer outlet to the sea, or to a tidal estuary on a flat shore.

The object sought to be attained by this plan is to permit the rise and fall of the tide in such a manner as not to disturb the flow of sewage, or drive back sewer gases during windy weather or during the rising of the tides.

In Mr. Rawlinson's plan, the sewer is much smaller than many outlet sewers, being oviform, 3 x 2 feet, with an area of 4.594 square feet, equivalent to a circle of 1.654 feet diameter.

The main is carried to a man hole chamber, at which a flap valve is placed over the inlet. There are two outlets, one from the bottom by an 18-inch cast iron pipe, leading to a point below low water, and terminating in a bell-shaped end opening downward, the other from the high water level by a 24 inch pipe of cast iron, so constructed as to discharge between high and low water mark.

The man-hole chamber is ventilated at the top.

At some distance back from the chamber an 18-inch cast iron pipe is led from the bottom of the sewer to the bottom of the man-hole chamber, which is above low water mark. It is there trapped, so as to prevent the passage of air if the pipe is not running full.

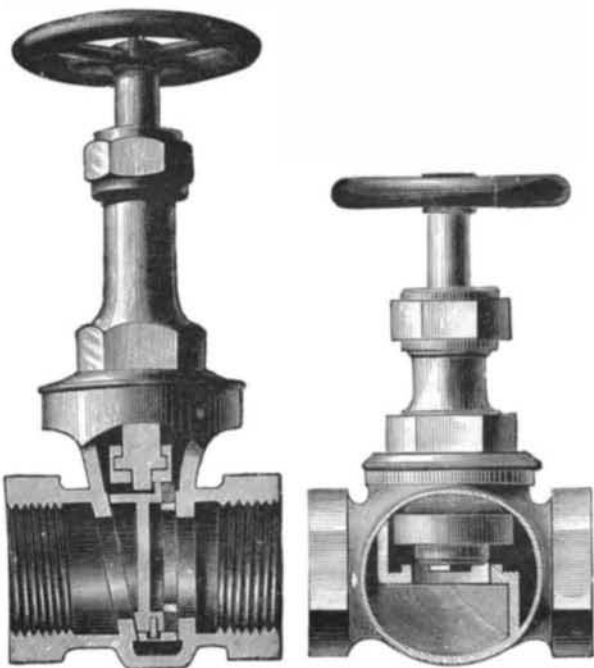
This pipe is intended to carry off the dry weather flow of the sewer without opening the flap at the chamber inlet, and thus allowing the entrance of wind from the outlet. A ventilated man-hole is placed over the upper end of the pipe.

This is, upon the whole, a neat arrangement. Its chief defect, if it can be called a defect, is in the reliance upon a flap valve. All automatic appliances are rather unsafe in a sewer, being liable to be clogged and their action impeded by the slime and foreign material, which cannot be prevented from entering the sewer. In this case the flap seems altogether useless, for the flood-water overflow, which is the

only inlet for wind at the seaward end, might just as well be carried to low water level, and seated in the same manner as the low water outlet.—*The Plumber and Sanitary Engineer.*

**JENKINS' PACKING AND VALVES.**

The engraving shows two forms of valve patented by the late Nathaniel Jenkins, and now a well known standard article familiar to manufacturers and steam engineers throughout the country. These valves are provided with disks of Jenkins' compressible packing instead of the usual metallic surface. This packing has been in every-day use for twelve years, and has been indorsed by first-class engineers and mechanics throughout the country. It is found to



JENKINS' IMPROVED VALVES.

render the valve perfectly tight under all pressures of steam, oil, or gas, and it is not injured by sand or grit, nor will foreign substances lodged between the valve and seat prevent it from closing.

Should it become necessary to repair one of these valves it need not be removed from its place, as the disk can be replaced in a few minutes, at a small cost, and without the aid of a mechanic. No regrinding is required as in other valves.

The improved packing is applied to various purposes, and is largely used by our best engineers and manufacturers. It is made up in sheets, gaskets, rings, and washers, and when used in a joint subjected to steam or heat it hardens, forming a body which, the manufacturers claim, will last for years, as it does not burn out or decay, and if care is taken, the joints may be often broken without injury to the packing. The same material is also made up into pump valves, which, we are informed, have given general satisfaction, being especially desirable on account of its heat-resisting qualities. It is used in pumps for handling oils and acids, and

may be used where rubber valves have failed, a special form of the packing made which is adapted to valve stems rendering the stuffing boxes steam and water tight.

Messrs. Jenkins Brothers, of No. 11 Dey street, New York city, and 104 Sudbury street, Boston, may be addressed for further information in regard to these inventions.

**AGRICULTURAL INVENTIONS.**

Mr. William H. Ryer, of La Crosse, Wis., has patented an improvement in sulky plows. This invention consists in the mechanism for raising and lowering the plow upon the frame, and in certain other features of construction, which cannot be described without engravings.

Mr. George W. Fink, of Pleasant Plains, Ill., has patented an improvement in that class of check row seed planters in which the seed-dropping mechanism is actuated by a rope stretched across the field; and has for its object to simplify the construction, lessen the weight, and increase the reliability of the seed-dropping mechanism.

A combined listing plow and seed planter, patented by Messrs. Leonard A. Cooper and Oliver F. Bostwick, of Atchison, Kan., is so constructed as to open the ridge or clear a space for the row of hills, open a furrow to receive the seed, drop the seed, cover the seed, and roll down the soil.

Messrs. Richard E. Caviness and George McCormick, of Beckwith, Iowa, have patented a check-row corn planter of the kind that is operated to drop the seed by a line stretched across the field.

An improved cockle mill, for separating cockle and other small seeds from wheat, has been patented by Mr. James M. King, of Walnut Station, Minn. It is simple in construction and effective in operation.

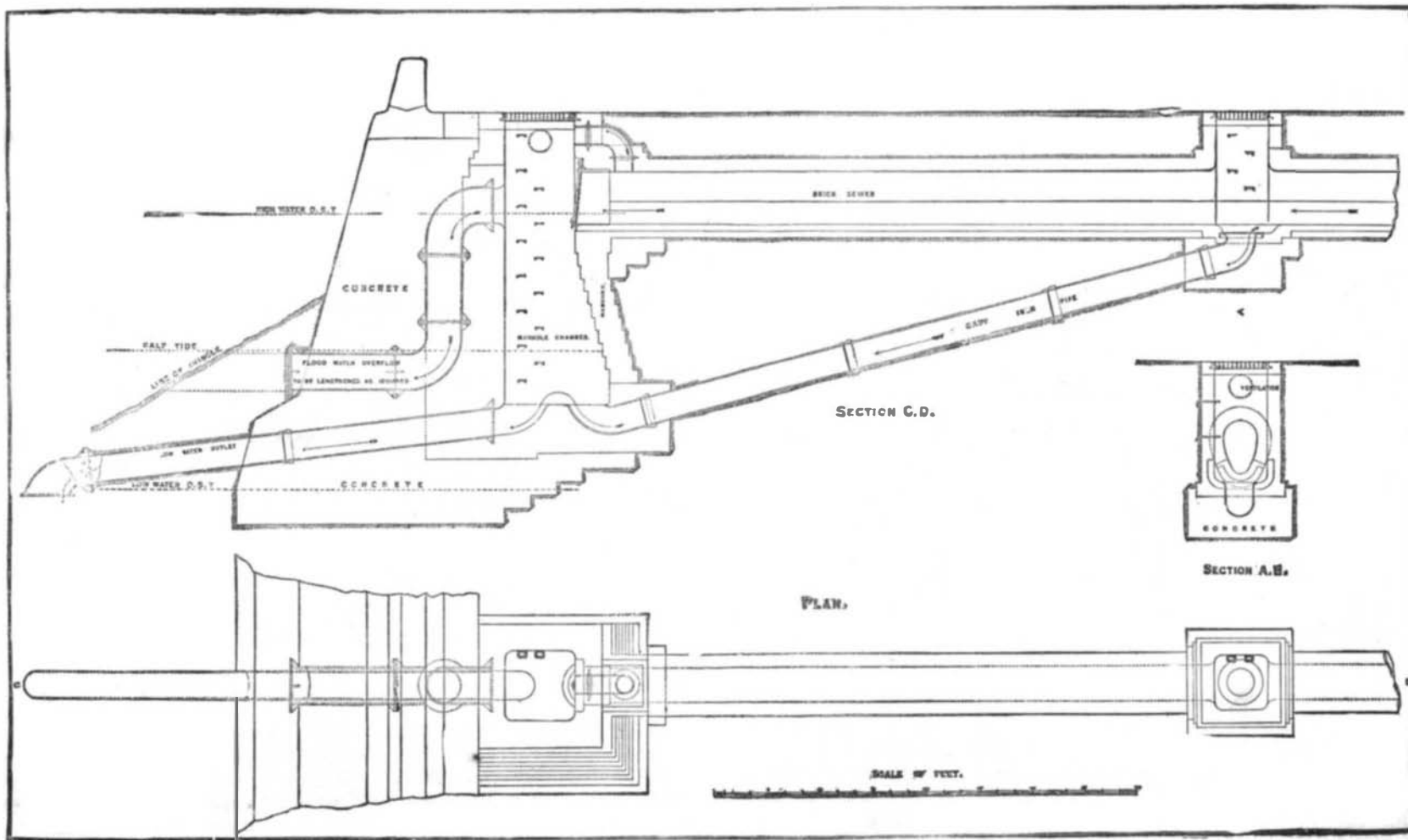
Mr. George C. Winslow, of Kalamazoo, Mich., has patented an improved harrow and cultivator tooth which is not only yielding to obstructions, but one capable of adjustment for greater or less tension, as well as adjustable to greater or less depth and inclination.

**The "Frigate" Mackerel.**

A notable event in the history of our coast fisheries was the sudden appearance, last summer, of the "frigate" mackerel in immense schools about Block Island and the adjacent waters. These fish are very common about the Bermudas, the Azores, and on the coast of Europe, but were never before seen in the waters of the United States. It was estimated that many of the schools in the vicinity of Block Island contained from 80,000 to 100,000 fish each. Considerable quantities of the fish were taken, but they were found in small demand as a table fish. They will probably prove valuable chiefly for the oil which they contain, and for use as a fertilizer.

**Beatty's Organ Factory.**

In another column of this week's issue we publish a new advertisement from the Hon. Daniel F. Beatty, Mayor of Washington, New Jersey, the well known manufacturer of the Beatty organ. An appropriate gift for a holiday present would be one of his 14 stops \$65 organs. Mr. Beatty extends a cordial invitation to all who desire to purchase either a piano or an organ to visit his manufactory at Washington, New Jersey. Every organ he sells he makes in his own factory. Read his advertisement and send for his holiday newspaper and catalogue, which he sends out free.



SEWER OUTLET ON TIDAL RIVER OR SEA SHORE.