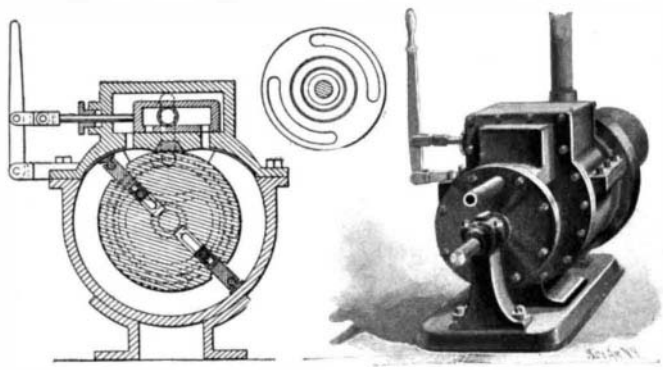
AN IMPROVEMENT IN ROTARY ENGINES.

The accompanying engravings represent a perspective view and cross-section of a rotary engine, together with a cut-off valve employed therein. The inventors are James T. Hay and Gilbert L. Depuy, of Garland, Texas. The engine comprises a cylinder with a fixed abutment in its upper portion. The piston is mounted concentrically within the cylinder, and in contact with the abutment. In the piston, two piston-heads slide having blocks mounted to rock on their outer ends so as to accommodate themselves to the shape of the abutment. The piston-heads are pressed into contact with the cylinder by springs, resting on trunnion-bars engaging cam grooves in the head of the cylinder. Above the cylinder is a steam-chest connected with the cylinder by ports on opposite sides of the abutment. In the steam-chest, a sliding reversing-valve controlled by a lever is mounted. The valve is provided with ports adapted to register with the cylinder-ports, only one port of the valve being in register with the corresponding cylinder at a time. The registering ports serve as exhaust ports; while the cut-off port serves as a steam-inlet. One side of the slide valve opens at all times into an exhaust pipe, so that the exhausted steam can readily escape. Into the steam-chest a channel opens, registering at intervals with the segmental slots of a rotary cut-off valve secured to the main shaft and revolving in a casing of its own. The valve controls the opening of a steam supply pipe directly opposite the steam-chest channel. When a piston-head reaches a lowermost position, the steam is cut off, the corresponding slot in the cut-off valve being out of register with the steam-pipe. As the other piston-head passes the abutment and steam inlet, the other slot in the cut-off valve begins to register with the steam-supply pipe; and a second impulse is given to the piston. In order to prevent leakage of steam, the inner faces of the cylinder heads, the interior of the cut-off valve casing, and the cut-off valve, are formed with grooves adapted to receive the water of condensation. As the grooves fill with water, they form a packing for preventing the escape of steam.

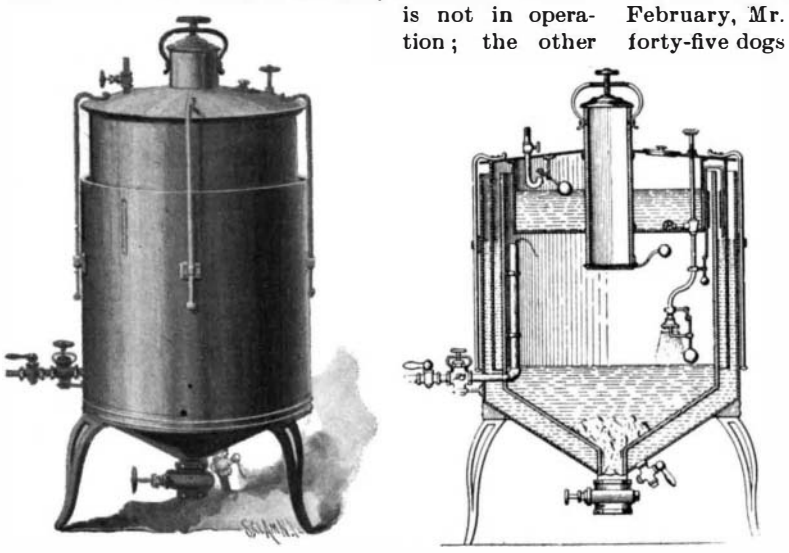


IMPROVED ROTARY ENGINE.

A NEW ACETYLENE GAS GENERATOR.

We present herewith illustrations of a new acetylene gas generator, in which the production of gas is automatically regulated in accordance with the amount consumed by checking the water fed to the calcium carbide.

The apparatus comprises a generator surrounded by a jacket of water, a holder, the body portion of which occupies the space between the jacket and generator, a tank secured to the holder, and a carbide-receiver, which extends centrally through the holder and tank, and which is provided with a cover and with a weighted drop bottom. Into the tank extends a water-supply pipe which is controlled by a float-valve. A water-distributing pipe runs downwardly from the tank and is provided with a sprinkler which plays over the carbide and which is provided with a float-valve. The water-distributing pipe is provided with two valves. Of these valves, one is controlled by a stem projecting above the holder and is closed only when the machine is not in operation; the other valve is controlled by a weighted arm and opened and closed by the rise and fall of the holder.



ACETYLENE GAS GENERATOR IN PERSPECTIVE AND CROSS-SECTION.

In operation, calcium carbide is fed through the receiver, and water is turned on at the supply pipe so as to fill the tank to the height determined by the float-valve. The water from the tank will pass through the distributing-pipe and will be sprinkled over the carbide, thus generating gas which is conveyed to the burners by a service-pipe. When the pressure of gas becomes excessive, the weighted arm controlling the valve in the distributing-pipe closes the valve under the action of the rising holder and thus checks the water. When the pressure falls, the valve reopens automatically.

When the apparatus is to be cleaned, the lime is removed by opening a valve in the bottom of the generator. Water is then turned on at the supply-pipe and is automatically shut off by the float-valve of the sprinkler when the desired level has been reached. After a time the water is drawn off. The operation is repeated until the generator is clean.

Further information regarding this apparatus can be obtained from Frank Zunino, 230 Washington Street, New York city.

Petroleum Joints for Common Iron Pipes.

A writer in Cassier's Magazine says that "To make a good petroleum joint with common iron pipes, a very good system is to heat both the male and female threads sufficiently to dissipate every trace of oil. Then make the joint up with thick shellac varnish, which may be combined with ordinary dry vermilion or even Venetian red. A joint of this kind I have found to stand well. A very good joint can also be made with ordinary yellow bar soap rubbed into the threads of the pipe, the grease first being removed. Treacle, honey, glue, mucilage, or glycerine, are quite petroleum-proof. For a stuffing box, ordinary wicking saturated with common yellow bar soap may be safely employed. Canvas, saturated with shellac varnish, makes a good washer, but soft metallic washers are better. A very good flexible diaphragm for a regulator may be made of closely woven cotton fabric, varnished on both sides with a compound of gelatine and glycerine. About equal parts by weight make a very tough and elastic compound. Wooden vessels, bags, etc., may also be made petroleum tight by saturating or varnishing with this compound. As a rule, all substances which are soluble in water are quite insoluble in petroleum. For stuffing boxes for standing both water and petroleum, castor oil may be employed, as this peculiar oil seems quite insoluble in either."

Return of Mr. Wellman.

Walter Wellman and the survivors of his Polar expedition arrived at Tromsoe, Norway, a few days ago after successfully completing their explorations in Franz Josef Land. In the summer of 1898, an outpost was established in latitude 81°. Two Norwegians remained there while the main party wintered in a canvas covered hut called Harmsworth House at the southern end of Hall's Island, latitude 80°. In the middle of February, Mr. Wellman with three Norwegians and forty-five dogs started north. It is said to be the earliest sledge journey on record for that high latitude. On reaching Fort McKinley, Mr. Wellman found one of his Norwegians had been dead for two months and the survivor was safe and cheerful notwithstanding the fact that according to promise he had kept the body in the house. The party pushed northward through rough ice and storms until they found new lands north of Freedom Island where Nansen landed in 1895. About the middle of March disasters began. Mr. Wellman while leading the party fell into a crevasse, seriously injuring his foot. A number of the dogs were killed by the fall of blocks of ice and some of the sledges were destroyed. The condition of Mr. Wellman's foot became serious and the Norwegians dragged him on a sledge by forced marches nearly two hundred miles. Mr. Wellman is still seriously injured. The other members of the expedition explored regions hitherto unknown, and important scientific work was done. No trace of Andrée was found.

The Color of Water.

BY PROF. SPRING.

The author reports on his experiments of many years to explain the color of the water. He has come to the conclusion that a pure blue is the natural color of water, for when we look through a long tube filled with distilled water against a brilliant white surface, a pure blue is seen, such as shown by the Lake of Geneva in quiet weather, a color which is not influenced by superficial or interior reflection.

When pure water becomes slightly turbid by extremely finely divided white or colorless particles floating therein, they reflect, even in the case of ground mountain crystal, a yellow light, which unites with the natural blue into a brilliant green color, such as is exhibited by the Neuenburg and Boden Lakes.

The peculiar facts established by various observers, that the water of ordinarily green lakes turns perfectly colorless at times, is not due to a clarification, but, on the contrary, to an influx of a reddish mud, colored by ferric oxide, which completely neutralizes the green.—Neueste Erfindungen und Erfahrungen.

Wood Flour in Dynamite.

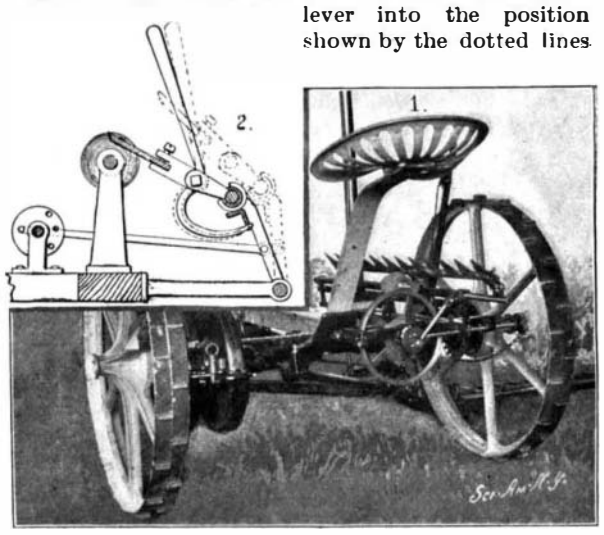
Wood flour is made by grinding saw-dust to a fine powder and is used for two general purposes: first, in the manufacture of dynamite and nitro-glycerine; and second, in the manufacture of linoleum and papyrolite, or artificial flooring. The wood flour is used as a cheap substitute for infusorial earth, which is the standard material for dynamite manufacture, It is regarded as distinctly inferior to infusorial earth for making explosives and it is only used where a cheap product is desired, or where the infusorial earth cannot be obtained. Wood flour has also been somewhat extensively used in the manufacture of linoleum. The floor-cloth is made by laying a coating of hardened linseed oil mixed with ground cork on a canvas net or back, but here again it was found to be hard and inelastic and for that purpose inferior to cork meal; so that its use has been abandoned by most German makers. Papyrolite is extensively used as a flooring for kitchens, halls, corridors, etc., and is also used on German war vessels because it has most of the advantages of wood, it does not splinter from shot or take fire. The subject has been investigated by several of our United States consuls, and the low price which is given abroad for it seems to offer little encouragement for imports from a source as remote as the United States.

AN INGENIOUS MOWING-MACHINE-SICKLE GRINDER.

Our illustrations represent in perspective and cross-section a new form of grinder for mowing-machine-sickles, in which the grinding-disk merely rotates and the sickle is reciprocated by special devices.

The grinding-disk is arranged above the axle of the mowing-machine; its shaft is parallel to the tongue and is driven by gearing operated from one of the mowing-machine wheels. The sickle is mounted on a series of holders adjustably held in a slotted tube and adapted to be oscillated to and from the disk by means of swinging arms attached to a rod connecting them with an eccentric forming an attachment to the gearing already referred to.

The means for raising and adjusting the sickle to enable the grinding-disk to act successively on the cutters or knives, comprise a pivoted lever (Fig. 2) having a locking engagement with the swinging arms, which is maintained by gravity. When two cutters or knives have been ground and it is desired to shift the sickle longitudinally, the driver of the machine throws the lever into the position shown by the dotted lines in Fig. 2, thereby raising the holders and sickle. The same movement releases the lever from engagement with the swinging arms. The lever can now be used for moving the sickle longitudinally and lowering it upon the grinding-disk so that the next set of cutters can be sharpened. Hence, in bringing the new cutters into position, the lever is pushed laterally or away from the grinding-disk, and then parallel with the tongue of the machine.



MOWING-MACHINE WITH SICKLE-GRINDER APPLIED.

The arrangement of holders and co-operating devices, so that the sickle can be shifted parallel to the tongue, secures economy of space, safety, and ease of adjustment.

The inventor of this attachment is Eddie V. Green, of Topeka, Kan.