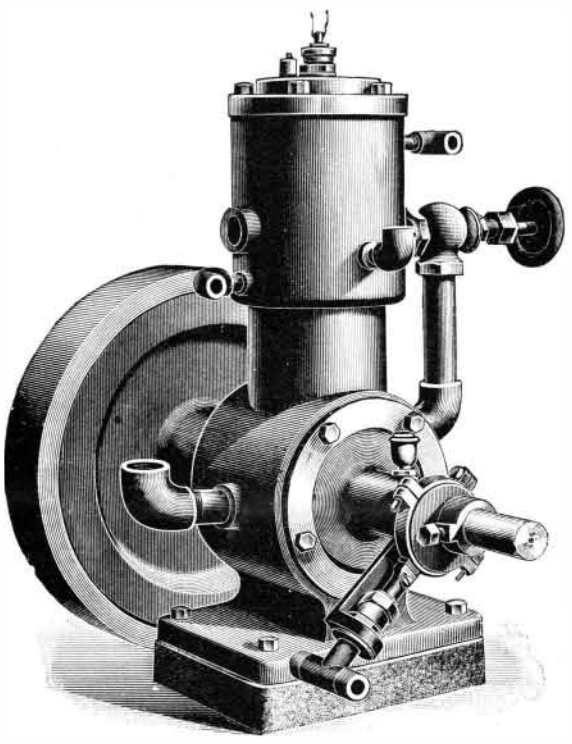
### NEW GAS MOTOR.

We give herewith an engraving of a new vertical gas and gasoline engine, recently brought out by Palmer Brothers, Mianus, Conn., with a view to furnish the complete engine or castings with working drawings for amateurs and others desiring to construct an engine.

It is suitable for running light machinery, when arranged as a stationary engine. The marine type (which



SMALL GAS AND GASOLINE MOTOR.

is shown in the cut) will run a 16 or 18 foot boat or light motor carriage. It will run in either direction.

A pump is used to circulate water in the water jacket of the portable engine. In the stationary form a tank is used instead of a pump. These motors are built on the two-cycle compression system, with an impulse at each revolution of the crank. It receives its charge and exhausts through a cylinder port opened and closed by the movement of the piston. A suitable valve regulates the charge received from the closed crank chamber in which the mixture is compressed by the downward stroke of the piston. Vapor and air are drawn into the crank case by the upward stroke of the piston, and thoroughly mixed by the motion of the crank. The engraving shows the circulating pump, but the pipe leading from the pump to the water jacket is omitted.

The weight of the marine engine is 135 pounds; of the stationary, 200 pounds. The height of the stationary engine is 23 inches and that of the marine is 17 inches. The height from the base to the center of the shaft is 4½ inches.

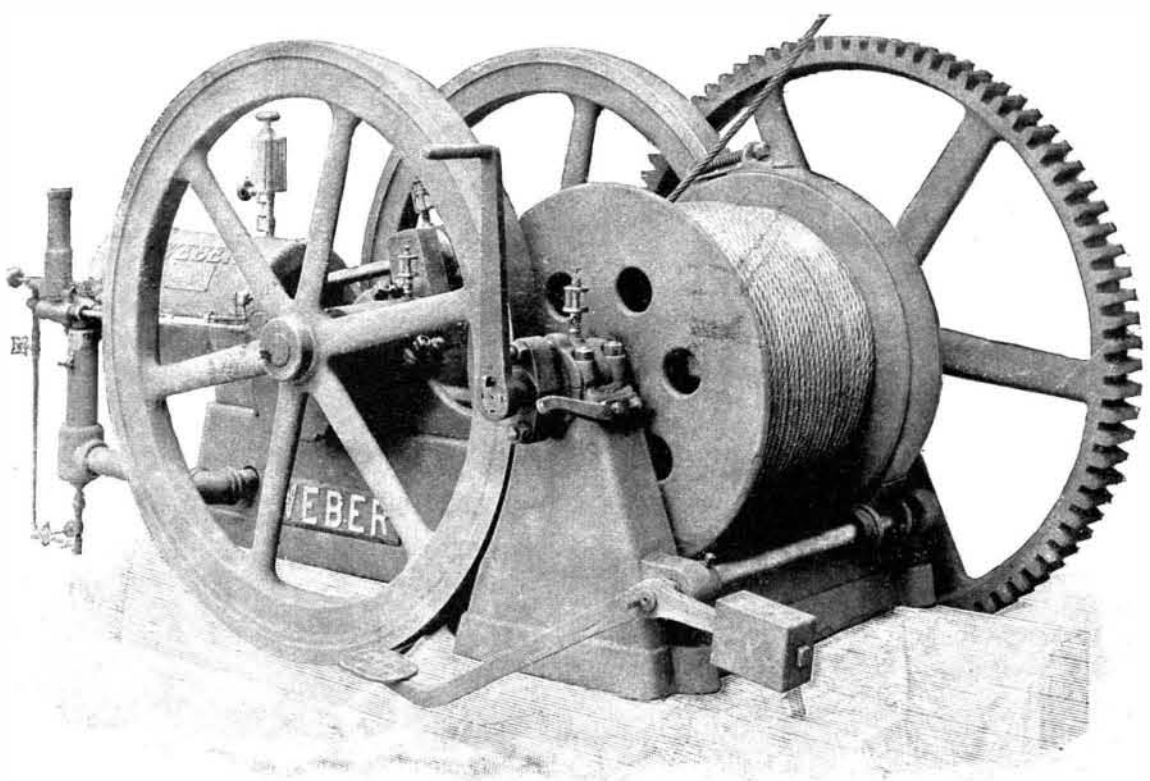
### GASOLINE OR GAS HOISTING ENGINE.

The facility with which gas or gasoline engines can be adapted to different uses and the extent to which these motors have been introduced into new fields is remarkable. The latest application of the gas and gasoline engine is shown in our illustration. It is a hoisting engine in which the gas or gasoline motor and the hoisting mechanism are mounted on a single rigid base. The hollow cast iron drum which turns on its shaft is carried by an internal wooden frictional driving device, and the power is transmitted from the engine shaft to the hoisting shaft by heavy spur gearing. The drum is provided with a steel strap brake, and both clutch and brake levers are placed in convenient positions. The motor has a special governor which enables the user to change the speed to suit the work to be done.

The machines are made in sizes ranging from ten to fifty horse power. They are simple in construction and adapted for all uses, but are especially suited to mining localities where water is scarce and fuel expensive. The use of these machines permits of working many mines which could not be worked if steam were the only motive power available. Either gas, gasoline, crude oil or distillate can be used. The manufacturers of these engines furnish a special driving pulley when desired which allows of using the engine for driving ventilating or forge fans, pumps or other machinery when it is not used for hoisting.

The hoister is compact, economical and safe; it can be managed by any one, and, as in the case of all gas engines, expense ceases when the engine stops.

The Weber Gas and Gasoline Engine Company, Kansas City, Missouri, are makers of this machine.




NEW HOISTING ENGINE.

### The Care of Watches.

There are a great many little superstitions connected with the handling and wearing of watches, as with everything not commonly understood. How many owners of timepieces are very wary about leaving them with a watchmaker, lest some of the "jewels" may be abstracted! If these people only knew that the most precious jewels in the ordinary watch are worth about eight cents apiece, and only about forty cents a gross unset, their alarm would vanish; but they would also look upon their watches with a great deal less of mystic veneration and awe.

Another common belief is that turning the hands backward will injure the works. How, they do not know—but in some mysterious manner that ordinary mortals cannot comprehend, In fact, the only style of watch which could have been injured in this way is the old English "verge" escapement, modeled after fourteenth century clocks—watches which almost anything would have injured, and which were useful for almost any purpose except keeping time.

A watch is a complicated piece of mechanism—the least elaborate have a hundred and fifty separate parts, some over a thousand, every part nicely adjusted to its delicate functions. And the movements never stop, unless the watch's owner neglects the important precaution of winding it, or, on the contrary, is so very solicitous about its welfare that he attempts to remedy the defects of its anatomy by surgical operations with a penknife, a pin, a lead pencil, or some other instrument as inappropriate.

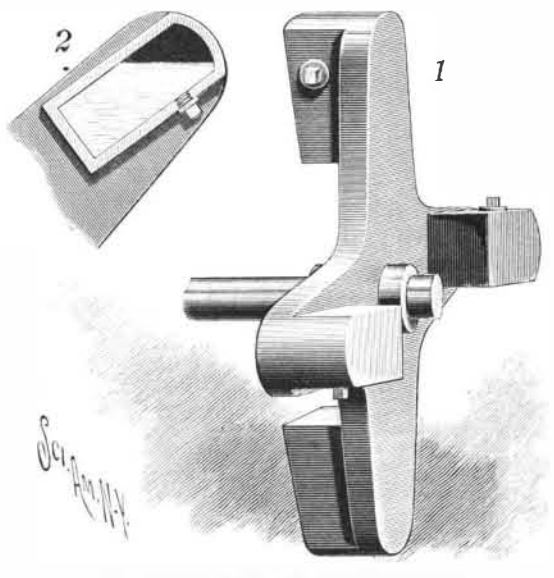
Wind your watch regularly. That is the first great rule for watch wearers. In the morning is probably the best time, so as to have the greatest tension of the spring during the day, when the works are most liable to shaking and hard usage. Have your watch cleaned and oiled regularly. The delicate balance wheel makes 150,000,000 vibrations during a year. The best oils will gum and clog where there is such continued friction.

Keep your watch pocket clean. Don't let lint and fine dust accumulate in the corners. No matter how well the cases may close, the subtile dust will work its way through soon enough.

Chief of all, curb your curiosity. Don't open the cases and inspect the works. They are there yet, even though you have not seen them since yesterday. If anything should occur to cause them to stop, don't try to find out yourself what it is. A watchmaker will charge you nothing for an accurate diagnosis, which involves no possible further injury. And don't try to regulate the watch yourself. You may do it successfully, but the chances are against you. In fact, the chances are that the watch may not need regulating at all. All watches, except the best, run faster in winter, slower in summer. Yet some men set their watches with every clock they see, and move the regulator, too, if they can pry the cases open.—Popular Science News.

### A NOVEL SHAFT BALANCE.

A balance more especially designed for use on pumps and other manually operated machines, to counterbalance any wheel or wheels on the shaft, is shown in the accompanying illustration, the device being designed to permit the operator to start the shaft and actuate the machine with great ease. The improvement has been patented by A. S. La Fontaine, of the Aruba Phosphaat Maatshappy, Curacao, Dutch West Indies. On the driving shaft of the machine on which the balance is to be applied is a spider with radial arms supporting at their outer ends closed boxes, as shown in Fig. 1, each provided with a filling plug to permit of placing water or other liquid in the boxes, as indicated in Fig. 2. The boxes are arranged alternately on opposite sides of the arms, and by partly filling the boxes a running weight is formed for the arms of the spider, designed to be free from all jerk or jar, as is so frequently the case with balance wheels for sliding weights, the construction also dispensing with a rim, and calling for less weight and bulk than a fly wheel.




LA FONTAINE'S SHAFT BALANCE.

### The Alleged Occurrence of Frogs in Blocks of Stone.

The occurrence of living frogs and toads inclosed in blocks of rock or stone or in clay, many feet below the surface of the ground, has often been reported, but never substantiated, says Leisure Hour. Dr. R. H. Traquair, keeper of the Natural History Collection in the Museum of Science and Art, Edinburgh, has examined this delusion, among others, and he puts all such reports down to want of power of accurate observation. A stone is being broken, a frog is seen hopping about close to the place, and forthwith the lively imagination of the quarryman persuades him that he has seen it actually come out of a cavity in the rock. Dean Buckland made experiments for the purpose of ascertaining how long frogs and toads could live shut up in cavities of stone and excluded from air and food, with the result that most of them were dead within a year, and none survived more than two years. Yet frogs are alleged to have been found inclosed in rocks which, geology teaches, were deposited under water millions of years ago, and afterward subjected to a pressure which has crushed all the fossils contained in them as flat as paper. If geology is right, the frog stories are utterly incredible. Or, as Dr. Traquair puts it, the blow of the hammer that disclosed a live frog inside a block of stone without an opening would at the same time destroy not only geology but the whole fabric of natural science.

ON the death of the Duc d'Aumale, on May 7, the Institute of France comes into possession of the splendid Château of Chantilly, with its splendid collection This bequest is valued at $8,000,000. The collections will now be opened to the public and a rare treat is in store for those who make the pilgrimage to the famous château. The exterior wings of the château are assigned as lodgings for the three curators. To meet the expenses of the preservation of the château, the great forest is included in the bequest. The funds obtained from annual clearings and from the income of other portions of the estate will produce more than the sum necessary for keeping up the château.