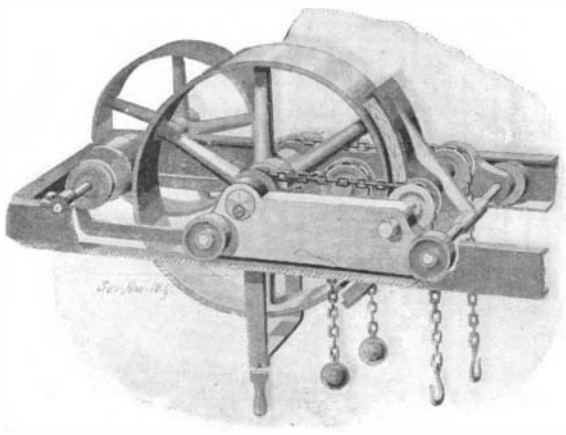
AN OVERHEAD HOISTING AND CARRYING DEVICE.

Our illustration pictures a novel overhead hoisting and carrying device, invented by Norman E. Brown, St. Joseph, Mich., which quickly raises a load, locks it in position, and then transfers it overhead to its destination.

The entire device is mounted on a carriage which travels on overhead tracks. In the carriage a shaft is journaled which carries a friction-wheel at its center, two sprockets placed one at each side of the friction-wheel, and eccentrically-mounted disks attached to a controlling lever. The friction-wheel can be moved into engagement with a driving-pulley secured on a driving-shaft driven by a belt. In order to lock the friction-wheel and driving-pulley together, spools are provided, which rotate loosely on the driving-shaft, and which are gripped by the inclined ends of arms projecting from the controlling-lever. About the sprocket-wheels carried on the shaft of the friction-



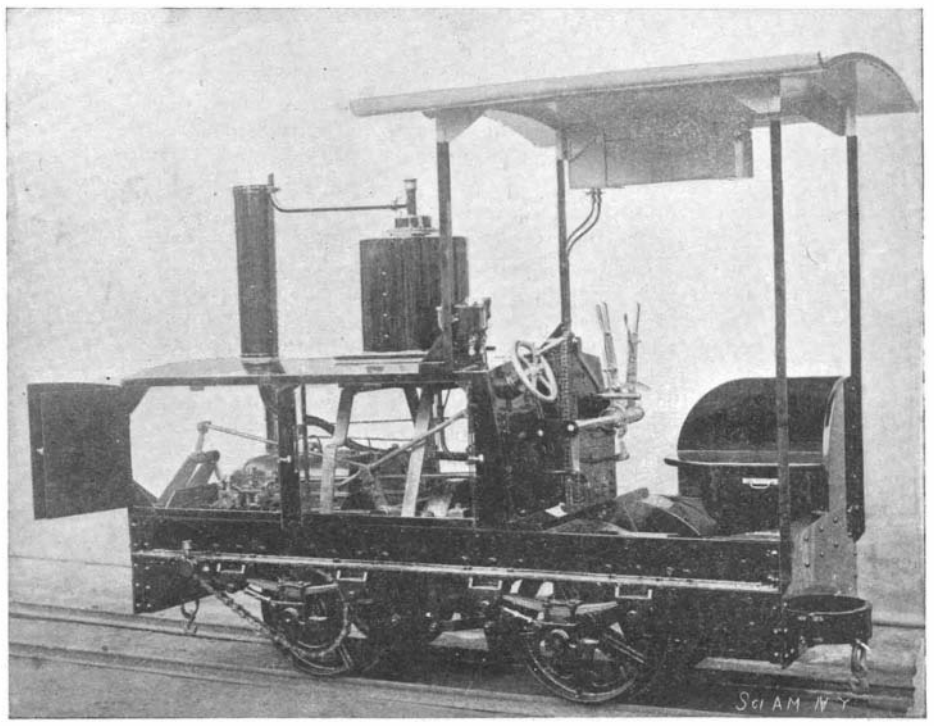
OVERHEAD TRAVELING HOISTING DEVICE

wheel, hoisting-chains pass, which extend over guide-pulleys.

By swinging the controlling-lever in a vertical position, the friction-wheel and driving-pulley are locked together, so that the movement of the one is communicated to the other. When the load has been hoisted, the lever is thrown to the right to turn the eccentrically-mounted disks and move the friction-wheel out of engagement with the driving pulley and into engagement with a brake-shoe on the carriage. The friction-wheel is thus prevented from rotating, so that the carriage and its suspended load can be moved along the tracks to the desired place. By means of the lever the wheel can be gradually released, so as to drop the load slowly.

PANHARD & LEVASSOR PETROLEUM LOCOMOTIVE.

The Panhard & Levassor Company, the Paris automobile constructors, have recently brought out a type of small locomotive with petroleum motor, whose general appearance is shown in the engraving. It is provided with a motor of five horse power, and is designed especially for use in shops or between the different buildings of large establishments. It is particularly adapted for the cases where the running of the locomotive is intermittent, as it is arranged to start and stop almost instantly by a simple device. The working parts of the locomotive are a combination of the same elements which enter into the construction of a petroleum automobile. The motor is of the same type as that used in the large Panhard & Levassor machines, and works by gasoline at 700 degrees density, using a carbureter at constant level; the ignition is obtained by platinum tubes maintained at a red heat by burners under pressure. A governor keeps the motor speed constant at 750 revolutions by closing the exhaust valves when the speed rises above this limit. A fly-wheel of 90 pounds is used with the motor. Movement is communicated to the front wheels by a set of speed-changing gears of the same type as used in the heavy automobiles. The motor is connected to the gears by a friction-cone of leather upon cast iron. As this mechanism is the same as for automobile wagons making at least four miles an hour, an additional set of gears is used between the first set and the pinion carrying the chain, in order to further reduce the speed. The chain passes to a wheel on the front axle, as will be noticed. Upon the rear platform are grouped the various levers for starting, speed-changing, etc., and the brake-levers, the arrangement resembling that of an ordinary locomotive; the idea is also carried out in the external arrangement. This type of locomotive will draw a load of about three tons.



PANHARD & LEVASSOR PETROLEUM LOCOMOTIVE.

A New Rifle Sighting Device.

A very ingenious additional aid for sighting rifles has been devised by Mr. W. Youlten, of England. It is called the infrascope, and by its utilization a soldier can sight his rifle to fire at a certain object, although the target itself may not be within his actual range of vision. The apparatus consists of a small metal tube about 12 inches in length and about an inch square. At each end is placed a small reflector, somewhat similar to the view-finder of a hand camera, inclined at an angle of 45 deg. The soldier fixes the instrument to a collapsible extension stock, attached to the butt of his rifle, and the breech of the firearm is brought to the level of the top of his helmet. The soldier, instead of securing his aim by means of the rifle sights, simply looks into the lower mirror of the infrascope, upon which is reproduced the reflection of the image in the upper mirror. The sight line of his rifle is also reflected upon this little mirror. The soldier, in firing, discharges his rifle, as it were, at the object in the mirror. The instrument is so perfectly adjusted that experiments have conclusively proved that the aiming capacity of the soldier is considerably improved by its co-operation. The British War Office has submitted the invention to a series of tests, and the report is so favorable to the device that there appears every possibility of the infrascope being attached to the small arm of the British army in the near future. It has been tested in the South African war with conspicuous success. In this case the instrument was utilized for scouting purposes, for which work it is specially adapted, since one can secure safe hiding and yet follow any movements in the surrounding neighborhood by the manipulation of the apparatus. It has also been developed for employment with the quick-firing machine guns and the heavier artillery.

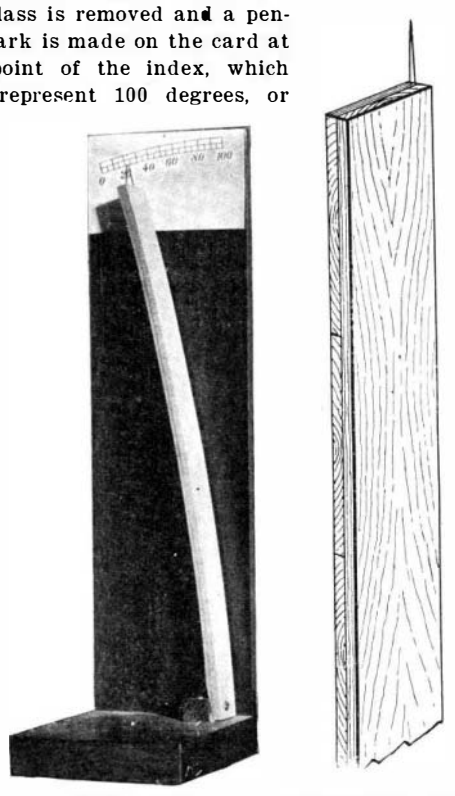
VII. SIMPLE HYGROSCOPE.

BY GEORGE M. HOPKINS.

No instrument is required to indicate a superabundance of humidity in the air. Everyone knows the discomforts of a moist, hot day in the summer without requiring a hygroscope. Still, to one scientifically inclined it is some satisfaction to know the hygrometric state of the air, and to compare one day with another of the same year or previous years.

A very simple hygroscope which is accurate enough for all practical purposes is illustrated by the engraving. Its construction was suggested by a panel made of two pieces of wood glued crosswise to keep it straight—the very best arrangement of the grain for causing it to assume a concavo-convex form under all conditions of the atmosphere except that in which it was glued together. It has a baseboard 4 inches square and 7/8 inch thick, with a back piece 4 inches wide and 13 inches high and 1/4 inch thick, attached to one edge. Near the right-hand edge of the base is secured a block to which is attached a hygroscopic strip made up of a longitudinal piece of any elastic wood (such as whitewood) 12 inches long, 1 inch wide and 1-16 inch thick, and a transverse piece of whitewood of the same thickness 1 inch long and 12 inches wide, carefully glued to it, so that the grain of one strip is at right angles to that of the other. These strips of wood should be well seasoned. This compound strip is secured to the small block on the base of the instrument, and a piece of plain cardboard is attached by two tacks to the wooden back at the center of the board, leaving the ends of the card free. The concave side of the strip should be arranged to face the left-hand side of the instrument, and a short piece of small wire, say No. 24, or a headless pin should be inserted point outward in the free end of the strip to serve as an index.

The scale is constructed by first placing the instrument under a bell glass with several pieces of wet blotting paper near but not touching the strip. The long, narrow strip does not change its length, but is bent one way or the other by the swelling or shrinking of the piece which is glued crosswise. The hygroscopic strip will straighten out or even curve in the opposite direction when submitted to the influence of moisture, and after the lapse of six or eight hours the glass is removed and a pencil mark is made on the card at the point of the index, which will represent 100 degrees, or



HYGROSCOPE. HYGROSCOPE STRIP.

the point of saturation. The instrument is allowed to assume the normal position by drying it in the open air, after which it is again placed under the bell glass with a dish of calcium chloride and allowed to remain five or six hours. The calcium chloride removes the moisture and causes the cross-grained side to shrink and thus curve the strip considerably. It now indicates the maximum dryness of the air, and a mark is made at the point of the index, indicating zero. The spaces between zero and saturation should now be divided into ten equal spaces, and each space may be subdivided into ten spaces, each representing one degree.

These lines should be neatly made with a drawing pen. Every tenth graduation should be extended a little and numbered; the entire scale being numbered from 0 to 100, i. e., 0, 10, 20, 40, etc.

This instrument is not intended to accurately show the exact amount of moisture, as is the case with the more elaborate hygrometers, but to afford a simple means of showing the ever-varying state of the air.

New Method of Bleaching.

The United States Consul at Coburg calls attention, in a recent report to his government, to Prof. Koechlin's method for the bleaching of cotton and other vegetable fibers by passing them through a bath of 100 liters (26 gallons) of water; 10 kilogrammes (22 pounds) of lime, and 50 kilogrammes (110 pounds) of bisulphite of soda. They are then steamed for an hour or two under a pressure of from one to two atmospheres, rinsed again and dried. The bisulphite can be replaced by hydrosulphite of lime. The cotton or other fiber may be boiled in the bath for a few hours instead of being steamed. Another process is to subject the goods for six hours under a pressure of two-thirds of an atmosphere to a liquid composed of 1,000 liters (264 gallons) of water, 10 kilogrammes of dry, caustic soda, 10 kilogrammes of soap, 1 kilogramme (2.2 pounds) of calcined magnesia, and 30 liters (7.9 gallons) of peroxide of hydrogen; the goods are then rinsed, soused, rinsed again and dried. The white obtained is said to be much better than could be had with hypochlorite, and the process is stated to do no damage to the fibers or fabric.

GOLD has been discovered near Apia, Samoa.