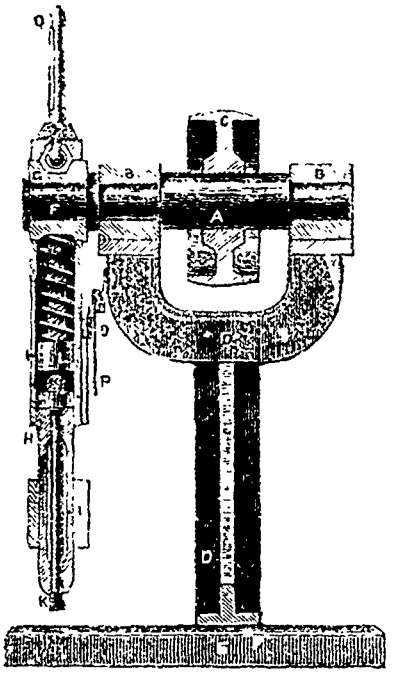
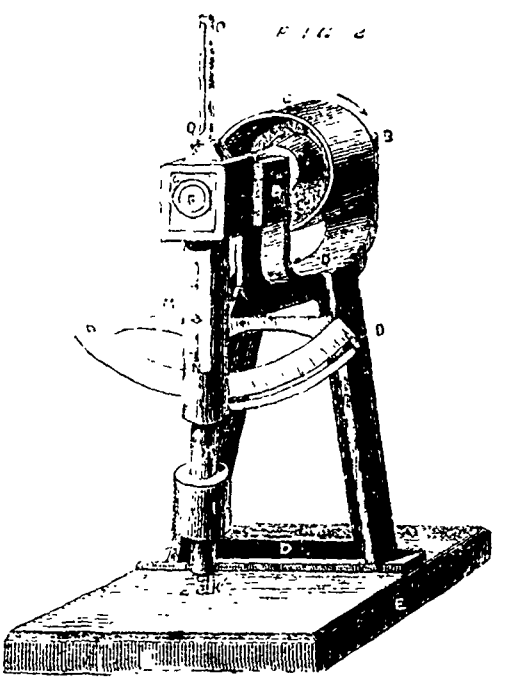
MACHINE FOR TESTING LUBRICATING MATERIALS.

The following is a description of a machine for testing the value of lubricating oils invented by Professor R. H. Thurston, of the Stevens Institute of Technology, Hoboken, New Jersey, which we extract from the Chicago *Railroad Gazette*. The form shown in the illustration was designed by Mr J. A. Henderson, a student of the above-mentioned Institute. The machine is intended to give the co-efficient of friction, pressure on bearings, and temperature of journal boxes at any time, and the readings are proposed to be taken at short intervals throughout the test. Fig 1, page 147, is a sectional side





elevation, and Fig 2 a perspective elevation The machine consists of a shaft A, running in two bearings B B, and driven by a pulley C The shaft is supported by a standard D D, carried on the base E E At the outer end of the shaft is a journal, F, of either steel or selected iron; suspended from this journal and clamping it by means of boxes G, is an arm H, carrying an adjustable weight I, which may be changed for one of different size, or adjusted on the arm, as is found requisite. The pressure under which the oil is to be tested is obtained by setting up the boxes, G, by means of the screw K acting on the nut L, on which nut the spring rests. The pressure per square inch is read off from the scale N which is traversed by an index M, attached to the spring. The friction causes the arm H to swing out from the vertical position, the moment of friction being indicated by the index on the arm O, which traverses the graduated arc P The co-efficient of friction is obtained by dividing the reading on the scale cut on the arc P by a second set of empirical divisors laid off on the scale N. The temperature is indicated at all times by a thermometer Q, set in the upper brass.

In using the machine, a small and determinate quantity of the oil to be tested is placed on the journal F, and the pressure being adjusted by the screw K to that at which the oil is desired to run under test, the machine is started at a speed which will give the desired relative velocity of rubbing surfaces. Observations are made at short intervals, and recorded, until the test is closed by rapid heating, as shown by the thermometer, and excessive increase of friction, as indicated by the arm H swinging up against its chocks. Competing oils are similarly tried, and the records afford a perfect means of comparison.

Thus, sewing-machine builders desire oil of long endurance and small frictional resistance and viscosity; on locomotives an oil that will bear high pressure for the greatest length of time without heating is the most desirable, even although not as limpid and of a slight frictional resistance. The relative power of resisting high temperatures without decomposition is another important point which may be tested. Any lubricant may be tested, whether mineral, vegetable, or animal oil, or tallow or mixture like axle-grease. The only precautions necessary are not to allow the temperature to run so high as to injure the thermometer or the journal surface, and to measure accurately the quantity of oil used

The form shown in the cut is that proposed for general use, but for extremely heavy pressures another form has been designed in which the pressure on the journal is obtained by a clamp composed of a fixed arm and a spring, the spring being set up by a hand wheel turning a nut in the end of the fixed arm. In this form of the machine, the moment of friction is measured by the compression of the spring. The essential feature of both forms is the combination in one machine or apparatus for making simultaneous dynamometrical and thermometrical tests of the lubricant. The machine is patented by Professor Thurston, but the patentee announces that master mechanics can obtain permission to construct and use it on application to him. He will also furnish applicants with the necessary dimentions for the machines and with the numbers to be attached to them.

News of a rather extraordinary feat in photography comes from San Francisco. It appears that a gentleman desired a photographic portrait of a celebrated trotting horse taken while the animal was going at full speed. The photographer set to work by arranging all the sheets in the stable as a sort of reflecting background. In front of these the horse was trained to trot, moving at the rate of 38 ft. a second. After two unsuccessful attempts, the photographer hit upon a method which gave a result as excellent, we are told, as could be desired. The operator closed his camera by two boards, so arranged that on touching a spring they slipped past each other, leaving an opening of one-eighth of an inch for the 500th part of a second. Using double lenses, crossed, a perfect likeness of the horse was obtained, and so instantaneous was the impression of the sensitive film that the spokes of the wheels of the vehicle to which the animal was harnessed were shown as if at rest This method may probably be turned to account in other directions.