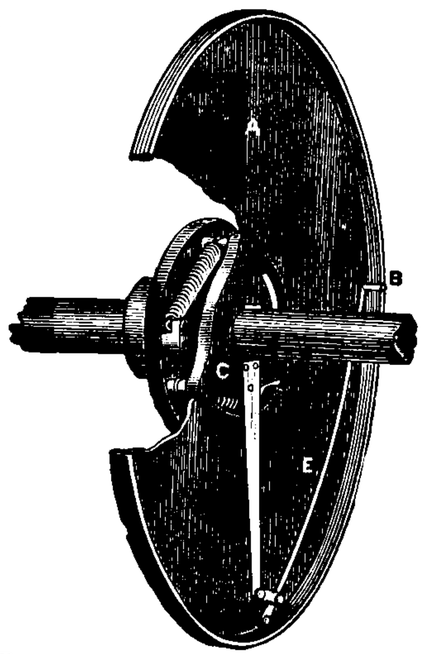
and link-motion may be so arranged that with one of the two adjustments the bead may commence to move when 8 horse-power is being transmitted at a certain speed; the whole motion from the circumference to the centre may be completed, when the horse-power transmitted varies from 8 to 12. With the other adjustment, the bead may start moving when 4 horse-power is being transmitted, and the entire travel of the bead from the circumference to centre completed by this transmitted horse-power increasing from 4 to 6. Slipping either the driving or the driven belt on to the loose pulley, G, causes the transmission dynamometer and the dynamo machine to stop while the engine is going on."

Dynamometer Coupling.—"The next figure shows Profs. Ayrton and Perry's dynamometer coupling, which differs only from the preceding in that it is intended to be used with machinery driven directly by shafting where belting is not employed. For instance, this coupling may be used to measure the horse-power given by a fast-speed engine to a dynamo or other machine driven directly by it, or it may be employed to measure the power given by a marine engine to the screw or to the paddles, or generally the horse-power transmitted along any line of shafting; the spring coupling, in fact, replacing the ordinary coupling used with such shafts.



PROFS. AYRTON & PERRY'S DYNAMOMETER COUPLING.

"One of the halves of the coupling seen in the figure is keyed to the driving shaft—for example, the shaft of a fast-speed engine; and the other to the driven shaft—for example, that of the dynamo. The half, C, is attached to the other half by means of the spiral springs, and the stretching of these is therefore a measure of the torque. The angular motion of the one relatively to the other causes the bright bead, B, to approach the centre, and, as before, the radius of the circle of light measures the horse-power transmitted at any particular speed. The arm, E, carrying the bead, is also, as before, slightly flexible, so that when no power is being transmitted the bead, B, is pressed with a certain force against the rim of the larger plate. Hence the bead does not commence to move until a certain prearranged horse-power, at a given speed, is being transmitted, and the whole motion is completed for any prearranged excess beyond this, thus enabling delicate measurements to be made at powers a little more or less than that normally transmitted.

"By a proper arrangement of the link-motions, we have succeeded in making the radial motion of the bead in both instruments exactly proportional to the extension of the springs or twist transmitted.

"The transmission dynamometer and dynamometer coupling just decribed have the great advantage over any sort of laboratory dynamometers, in that the former have not to be put into position and adjusted for each particular experiment, but are always ready, and are always indicating the power transmitted at any given speed. If, for example, a dynamometer coupling be inserted in the shafting of a factory in place of the ordinary coupling, a glance at it at any time will show the power that is being transmitted by it. If two such dynamometer couplings be inserted at two places in the same set of shafting, the difference between the transmitted powers indicated by them is the power utilised by the machinery driven by that portion of the shafting that is between them. At present, masters of works, we think, have necessarily but rather a vague idea of the amount of power expended in different parts of their works—how much, for example, is used to drive one portion of the machinery and how much to drive some other. The substitution of a few dynamometer couplings, at well-chosen places, for the ordinary couplings, would settle this question."

Note.—For a more complete section on Dynamometers, see the Author's *Text-Book on Applied Mechanics*, Vol. I., Lecture VIII.