

to a solid cast frame there are two small cylinders, bored to a diameter of 0.796 in., giving an area of $\frac{1}{2}$ sq. in. These cylinders connect through the pipe connections mentioned to the ends of the dynamometer cylinder. Both cylinders are single ended, opening towards each other.

Between the two cylinder bores is an aluminium piston rod, the ends of which are turned, and brass piston sleeves fitted thereon. These sleeves are turned with four packing grooves, 1-64 in. deep. At the

top of the recording table.

As mentioned, a sheet of paper can be put in continuous motion over the face of the table under the recording pen. The mechanism that moves this paper is shown in fig. 5. On one of the axles of the four wheel truck there is mounted a 4 groove rope pulley, with a corresponding wheel mounted on a shaft on the frame of the recording table. Four spring belts pass around both wheels, passing up through a box opening in both main and dynamometer

prevents it from unrolling too rapidly. From this roll the paper passes up over a roller, the top of which is flush with the table top, thence forward on the table, and over a similar roller, and down on the front paper roll, on which it is wound by the worm mechanism, which can be thrown in and out at will.

The paper passing over the table is to be seen in fig. 6, all the recording apparatus being shown there also. On the pantograph arm is the pressure recording pencil. To

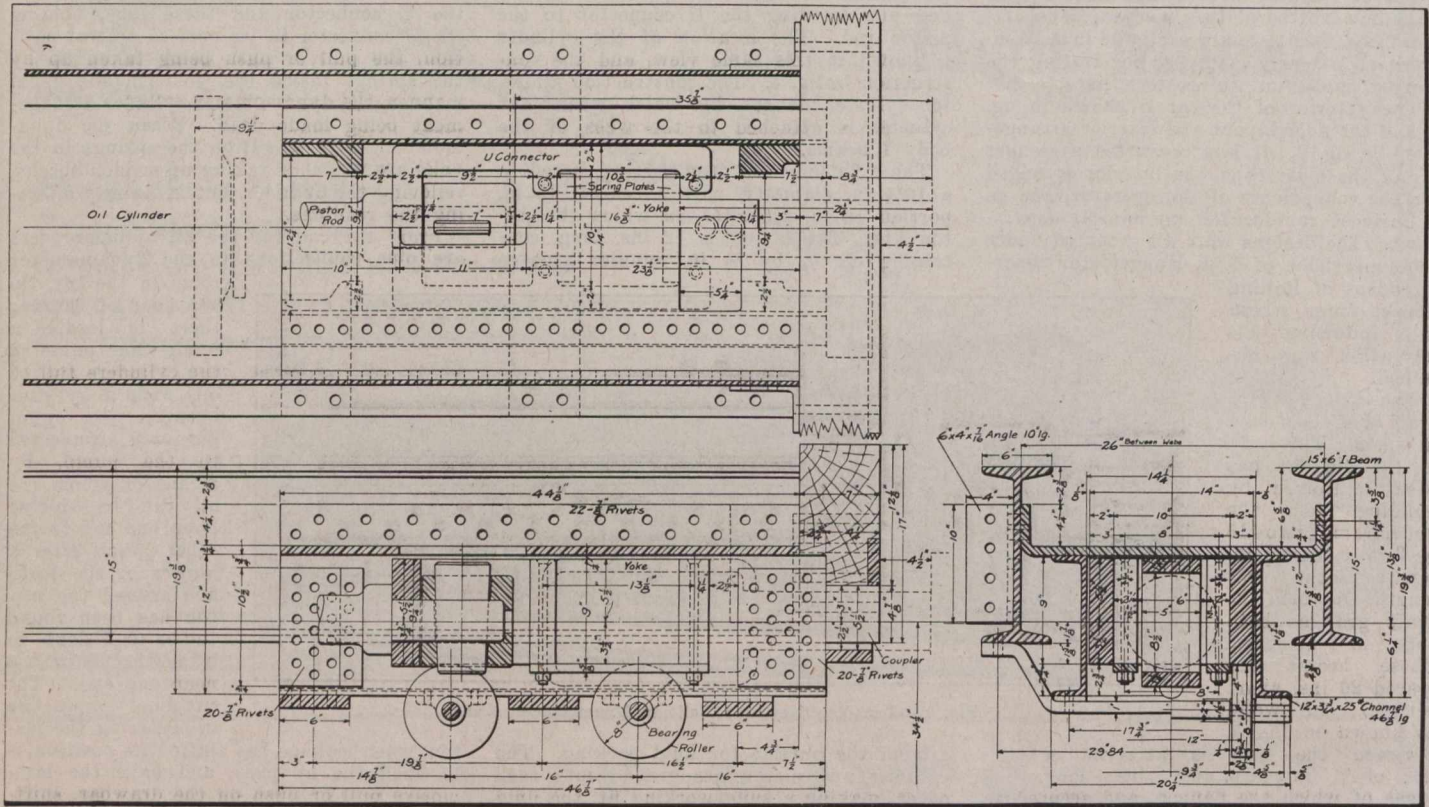


Fig. 3.—End Construction and Draft Rigging of Dynamometer Car.

centre of the piston rod there is a type of crosshead, connected to it by a wrist pin, the outer ends of the cross head attaching to connecting rods which pass alongside each cylinder to cross heads at the rear of each cylinder. Between each cross-head and the cylinder head are calibrated indicator springs, so that the distance of piston displacement due to oil pressure is a measure of that pressure to a scale dependent on the calibration of the springs.

room floors. The motion of this frame wheel is in consequence dependent directly on the speed of the car.

The carrying shaft is connected by a universal joint to a short worm shaft, the end furthest from the universal joint being carried in a bearing that can be moved through a small arc, and clamped in any of its positions by a clamp lock. By this means it can be brought in or out of engagement, with a worm wheel directly

the rear is an indicating pressure gauge, connected in with that end of the pressure recording cylinder, the dynamometer cylinder pressure being there indicated for that end of the cylinder. At the rear end, under the table, is another gauge, for indicating the pressures on the other end of the cylinder. The opposite end, being that most used, is placed on the table in a conspicuous place, and can be read in conjunction with the paper records.

In front of the rear gauge there will be noted an electrical ticker, similar to a telegraph instrument, consisting of a double electromagnet, in front of which is a hinged flapper, the lower end of which is also hinged to a rod running across the table, to which two pens are attached, in adjustable positions, for marking two datum lines on the moving paper.

In the front of this rod is another cross rod connecting a gauge in the foreground with the black box in the left background. The latter is a speed recorder, connected through a long spring belt with a pulley on the truck axle. A flexible cord in the speedometer connects with this front cross rod, the rear end of the cross rod connecting with the gauge in the foreground, this gauge indicating the speeds on the dial face. The speeds are also recorded graphically by a stylograph pen attached to the cross rod.

The pens on the rear cross rod are so adjusted as to give datums for the pull on the far side of the paper, and for the speed on the near side of the paper. The electrical attachment on the far end of this

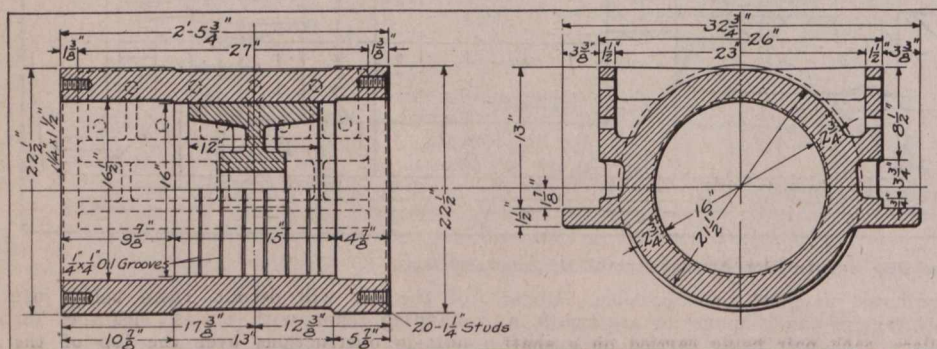


Fig. 4.—Oil Draft Cylinder of Dynamometer Car.

The springs at each end only operate one at a time, depending on the end of the dynamometer cylinder in compression. Through a pantograph movement a stylograph pen on the outer end of an arm multiplies the extent of the piston displacement, marking the same on a sheet of paper that passes continuously over the

beneath it, a pinion on the same shaft as the latter meshing with another gear on a lower shaft, this latter shaft carrying between the frames a recording paper roll. On the rear part of the table frame is another paper roll, carried on a shaft on bearings on the rear legs. A friction brake regulates the movement of this roll, and