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speed up is well shown. The final current is 18 amperes per motor.

The mean current for the first four seconds from the moment when the circuit is made appears to be 75 amperes. This would give us a total torque per motor (see Fig. 21) of 2,430 inch-pounds. Deducting the frictional torque corresponding to a current of 18 amperes per motor —namely, 755 inch-pounds—we have 1,675 inch-pounds available for acceleration. Since the weight to be accelerated is 3·4 tons per motor, the acceleration is 2·05 f.p.s. per second. The acceleration curve has been drawn as if the acceleration were constant from the moment of making the current; this is not strictly correct. The curve should cut the time base about one second from the origin, but it gives a fairly accurate measure of the mean initial acceleration, which by measurement appears to be about 2·1 f.p.s. per second.

Fig. 52 is the record of a test in which the motors were allowed to speed up in series. The current taken does not appear to have been quite so much as in the case represented in Fig. 51. The form of the current curve is well shown, both with the series and with the parallel connection, and indicates the jerk experienced when the motors are thrown into parallel, the acceleration at this point being greater than at the moment of starting. The energy required to attain a speed of 35 f.p.s. is less than that required by the method illustrated in Fig. 51.

The diagrams show a considerable increase in the current taken from the line at the moment when the motors are thrown into parallel connection. It is instructive to inquire if this increase is necessary, and to