New Train-Stop System Developed in Germany

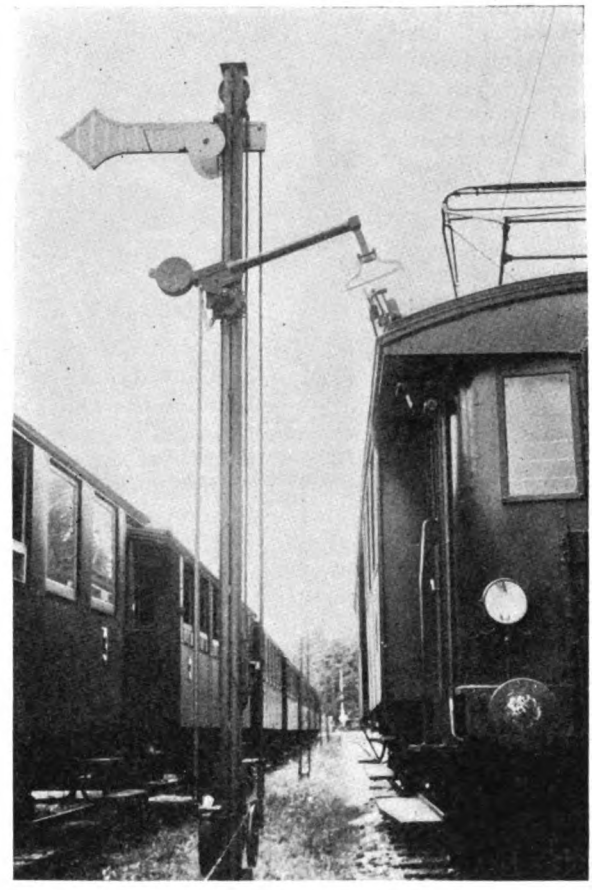
A NEW type of mechanically-operated automatic train-stop system, developed by George Kofler, an Austrian engineer, has been tested, with results said to be entirely satisfactory, on an electrified section of the German State Railways, known as the Isar Valley line, in the vicinity of Munich. Briefly, this is a mechanical-trip type of control with the locomotive unit on a level with the top of the engineman's cab, and the wayside unit is an arm extending from the wayside signal mast at a point 10 ft. 11 in. above the level of the rail. This arm is operated in connection with the semaphore in such a manner that when the semaphore is at stop the train control arm is lowered to extend toward the track. On the end of the arm there is a heavy metal loop with a lightly curved section at the bottom which contacts with the engine units.

The engine contact ramp or bow is so arranged that as it contacts with the wayside unit the engine bow is forced down, thus opening a valve which in turn applies the brakes or operates a warning signal, as the case may be. After the operating bow passes under the wayside arm, a second ramp or bow, which is fixed, then contacts with the loop on the wayside arm, effecting a release and allowing the arm to be thrown upward where it latches in a position beyond the clearance limits so that it will not be struck by any portion of the cars of the train. When the loop on the wayside arm strikes the fixed ramp on the engine the loop is turned so that the arm revolves on its own axis *b*. Now referring to the cross section a-b (Schnitt a-b) the turning of axle *b* operates lever *d*, link *e*, thus pulling the locking pawl *f* out of its notch in segment *g*. At one side of the casing *h* there is an adjustable spiral spring *i* in the drum *k*. When the locking pawl *f* is pulled, the spring *i* turns the entire case, to which the arm is attached, thus bringing the arm up to the second position (Signal-Fahrt Stellung), out of the way of the passing train.

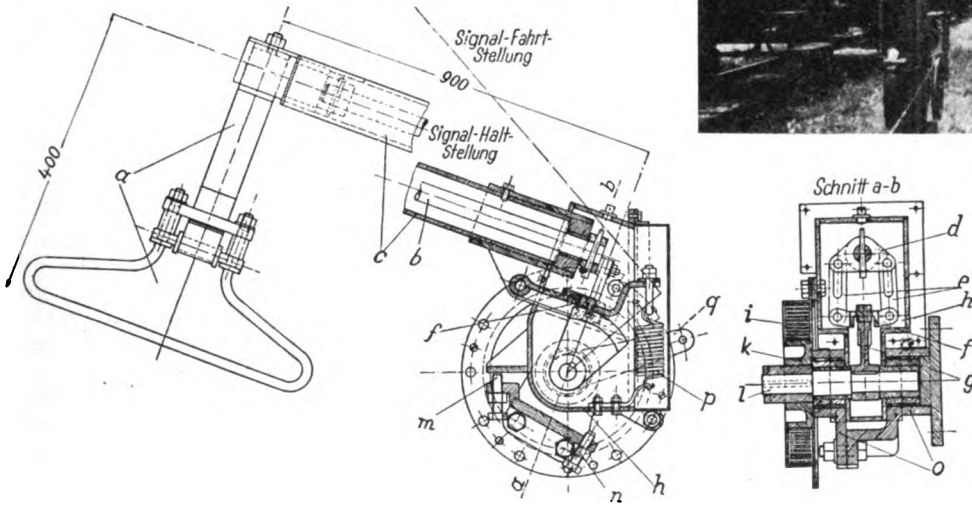
The next operation of the signal again engages the train-stop arm and when the semaphore is again placed in the Stop position the train-stop arm will be moved into a position to engage the train-stop unit on the locomotive.

The length of the bow on the wayside arm is such as to insure contact with the engine element regardless of the "roll" or oscillation of the engine. In order to insure that the engine unit will be at the proper height to contact with the wayside arm regardless of the up-and-down motion of the engine on its spring, the engine unit is mounted in a case which is free to move up and down, the whole case being supported by a rod extending down to a boxing on an axle.

Between September 13 and October 28 of last year, 29 trials of this new system were made by the German State Railways. In each trial the car was stopped immediately, as soon as the train stop was applied, in some cases the speed of the car having been as high as 53 kilometers (33 miles) an hour. On all the 29 trials no objection was found to the operation of the system, and no faults were found.



The mechanical trip arm is approximately 11 ft. above the rail



Cross-section of the wayside arm: a, striking lever; b, axle; c. bracket tube; d, lever; e, drawbars; f, locking pawl; g, locking segment; h, casing; i, spiral spring; k, spring drum; l, axle; m and n, adjusting screws; o, bearing; p, screw spring; q, lever