LOCOMOTIVE TENDERS.

Several Examples of Improved Practice.

By William Forsyth.

(Concluded from page 184.)

Pennsylvania Six-Wheel Tender for Class E 1 Engines.

Another example of six-wheel tender for fast passenger service is shown in Figs. 9 and 10, which represent the tender of the Pennsylvania Railroad class E 1 engine, which was fully illustrated and described in our June issue. In this case the middle and rear axles are equalized. The tank carries the coal above the water and holds 4,000 gallons. The coal runs down to the fireman at an elevation about one foot above the foot plate, which is convenient in view of the high fire doors. The usual wooden flooring on top of the frames is omitted in this design.

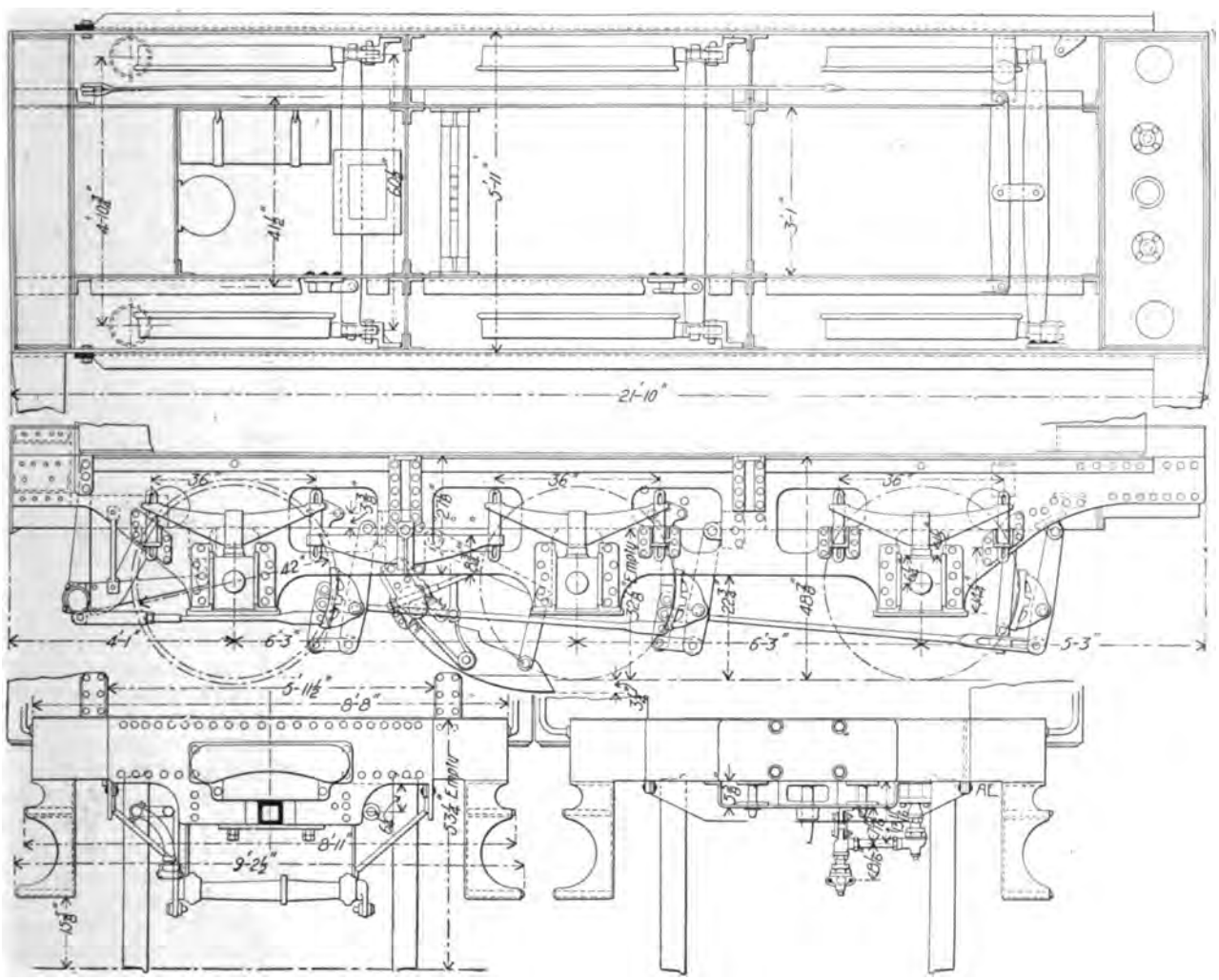

Fig. 9.-Frame for Six-Wheel Tender Pennsylvania Railroad.

The main frames are outside of the wheels and the boxes are carried in bracketed pedestals bolted to these frames. The main frames carry an internal cellular system with longitudinal stiffening plates and cross girths which attach to the main frames between the wheels. The tank rests between box girders projecting above the frames at the front and rear ends, the front one being much deeper than the one at the rear. The tank is wedged tightly in place and is held by special fastenings riveted to it and to the frames, the purpose being to hold the tank in case of collision, so that it will not be torn loose by the shock and endanger the lives of the engineer and fireman. This is in marked contrast with the usual ineffective fastenings, and the practice is suggestive of a necessary improvement in tank fastenings. The brake cylinder is at the rear and vertical. It operates a bell crank with two arms projecting vertically downward to the equalized brake system. Another arm takes the hand brake connection. In the front end of the tank structure four closets are built for clothes, tools and the steam pump used in connection with the steam heating system for the train. The water space bracing consists of 2½ by 2½ by 5/16-in. angles, spaced 2 ft. 10 in. apart, and connected across by 6-in. plates. This tender has an excellent arrangement of draft gear in which the drawbar has 1⅞-in. lateral play each way from the center. The design employs iron and steel throughout and is made to receive the Janney coupler. The buffer is a plain two-stem plate with springs which are not equalized with the coupler, and the guides for the follower and buffer are steel castings. The buffer and draft springs are enclosed in metal boxing, the whole arrangement being the most durable that we have seen.

These tenders are supplied with the form of balanced track tank scoop which was fully illustrated on page 283 of this paper in November, 1896, and the fact that the same drawings were used for the scoops of the class E 1 engines testifies to the attention this road gives to designing. The experience of four years has not developed a single desirable improvement in this detail. The interesting feature of the scoop is the balancing of the lower part so that it may be raised from the trough at high speed. It has been demonstrated that water may be taken at speeds of 70 miles per hour. Experiments indicate that 3,000 gallons may be taken in 10 seconds at a speed

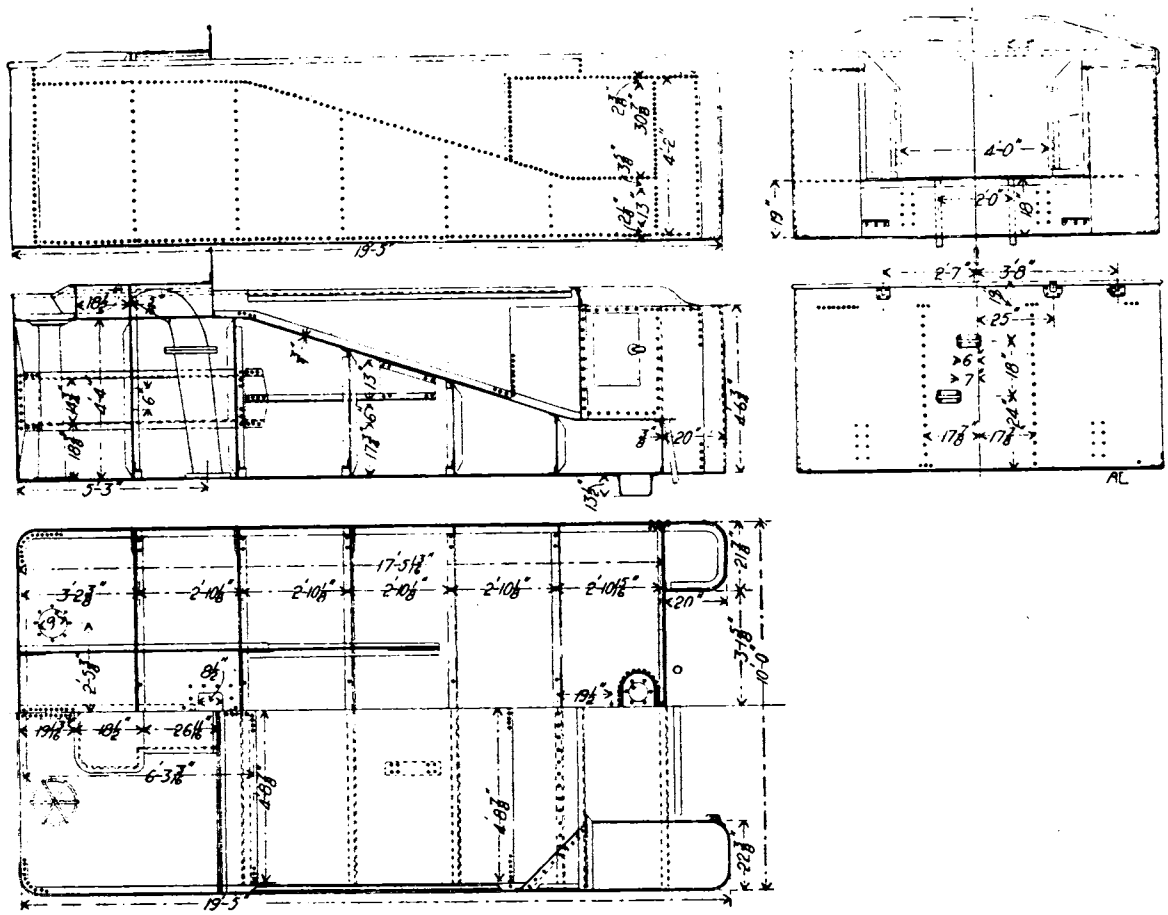

Fig. 10.—Sectional Views of Tender Tank for Class E 1 Engines, Pennsylvania Railroad.

of 68 miles per hour. The following figures have been supplied from tests made with one of these tenders:

Time in seconds.	Speed in m. p. h.	Gallons water taken.	Dip of scoop in water.
20	34	1,760	3⅛ in.
17	40	2,315	3 in.
14	49	2,380	3⅛ in.
11	62	2,608	3 in.

These figures show that more water was raised per foot of trough at the higher than at the lower speeds, which is accounted for by the form of the opening which takes in the wave raised by the scoop and adds to the depth of water taken. These tests indicate that there should be no difficulty in picking up 3,000 gallons from a tank 400 yards long at speeds of 60 miles per hour.

An Atlantic liner, larger than any now afloat, has been ordered by the North German Lloyd, to be built by the Vulcan Shipbuilding Company of Stettin, Germany. It is rumored that her length will be 752 ft., her speed 24 knots, and that her engines will develop 40,000 h.-p.

A lathe, direct driven by an electric motor, turning up a piece of shafting while the whole combination was suspended from an electric traveling crane, was exhibited to a party of engineers visiting the Crocker-Wheeler Electric Company's works recently. This ingenious application of electricity to machine tools was devised to exhibit the flexibility of the electric method of power distribution and was described in "The Mechanical Engineer." The lathe had a motor direct connected to the spindle and the piece of shafting was placed in the centers. The electric current was applied by a cable connected to the traveling crane. The current was applied, the lathe started on the floor and then lifted by the crane and carried up and down the shop while turning up the shaft.

THE FUTURE USEFULNESS OF THE MASTER MECHANICS' ASSOCIATION.

By M. N. Forney.

It is very difficult for an old newspaper man to lay off the spirit of cock-sure criticism. The habit of assuming for years that he is very wise and very right in his opinions cannot be laid aside when his editorial pencil has been blunted, and when he no longer has the right to speak of himself as "we." Annual conventions like those which have just been held in Saratoga are incentives to be oracular, they excite criticism and stimulate the feeling common to most of us, that we know just a little better than others how such affairs should be conducted. If besides the conventions of this year a person can go back for thirty years and recall the meeting held in Philadelphia in 1870, and nearly all since then, it is a still further incentive to criticism and suggestion.

The fact that a committee was appointed to report on the question of "What Can the Master Mechanics' Association Do to Increase its Usefulness?" naturally suggests two questions, what have been the hindrances to the usefulness in the past and what would aid in increasing it in the future? The retrospect of thirty years will be a help in replying to the first part of the inquiry, and it suggests two causes which during that time have seriously interfered with the usefulness of the meetings. The first of them is meeting rooms in which only part of the proceedings could be heard, owing to noise or bad acoustic properties, or an arrangement of seats by which the audience and the speaker have been separated too far from each other. To hold meetings for discussion at which the speakers cannot be heard seems like great folly; nevertheless, it has happened at many of these meetings held during the past thirty years that a great part of the proceedings were inaudible to many of those who attended them. To increase their use-