those in existence as standard, and as adopted in 1913. Your committee respectfully recommends that the revision of the specifications for air brake and signal hose for passenger and freight equipment cars be made standard; that the specifications for steel axles be adopted as standard, and that the following specifications be submitted to letter ballot as recommended practice: Refined wrought iron bars, heat treated knuckle pivot pins, welded pipe, helical springs, chain, and journal box brasses.

The report was accompanied by recom-

mended specifications for air brake and signal hose for passenger and freight equipment cars, welded pipe for passenger and freight equipment cars, heat treated knuckle pivot pins for passenger and freight equipment cars, steel axles for passenger and freight equipment cars, refined wrought iron bars for passenger and freight equipment cars, helical springs for passenger and freight equipment cars, chain for passenger and freight equipment cars and journal brasses for passenger and freight equipment cars.

## Report of Committee on Couplers and Draft Rigging.

The Master Car Builders' Committee, R. L. Kleine, Chief Car Inspector, Pennsylvania Rd., chairman, submitted a very complete report, of which the following abstract has been made:

Comparisons show that the experimental couplers reported on last year are much stronger throughout than present types of couplers and that your committee is working along the right lines. This work has been conducted jointly with the coupler manufacturers. A joint committee held numerous meetings to discuss and decide upon details and fundamentals of design, such as operation, contour lines, strength of the various parts, dimensions of knuckle hub and knuckle-pin hole, location of knuckle-pin hole and lock set, height of coupler head, size of shank and type of knuckle thrower, etc. Considerable discussion ensued on these points which are very pertinent to design, each one influencing the other to such an extent that full development or perfection of any one will handicap one or more of the others. The members of the association were invited to make a critical examination of the coupler models and give the committee the benefit of their criticisms and recommendations, at last year's convention.

STATIC TESTS.—A series of static pulling tests consisting of two couplers of each design submitted by the coupler manufacturers and exhibited by your committee was instituted at Altoona shops, Pennsylvania Rd. under the direct supervision of C. D. Young, Engineer of Tests. tests on these couplers were made by laying the couplers off and measuring both deflection and permanent set after each increment of load and tabulating the distortions by so much plus or minus from the original dimensions. A comparison of permanent set at the knuckle openings shows the committee specification type to have a decreased set of 78.9% at 150,000 lbs., and an increased loading of 94.1% at the M. C. B. limit of set. The total load can be increased 75.5%. This likewise applies to the knuckle stretch, which shows a decreased set at 150,000 lbs. of 98.9%, and an increased ultimate load of 69.5%.

ROAD TESTS were continued, and were conducted with couplers of present type on freight cars and with couplers of both present and the experimental design on freight locomotive tenders on the Pennsylvania Rd. The freight car couplers were applied to 100,000 lbs. capacity steel hopper cars in the coal trade between the bituminous mines in western Pennsylvania and tidewater, a service comprising grade and flat country as well as hump-yard classification. The tender couplers were applied to 7,000 gal. steel tenders in general heavy freight service on the Western Pennsylvania division, between Altoona and Pittsburg, which includes heavy grade service. The road tests of couplers on tenders in freight service develop in the shortest space of time the defects as well as the relative life

of couplers, and it is surprising to note the short life of couplers of the present type in this service, as well as the relatively longer life that is being obtained from the experimental coupler.

SELECTION OF COUPLERS FOR GENeral trial in service.—Coupler manufacturers designed the working parts of the couplers submitted at the last convention, and it was essential to select from these couplers several designs to be tried in service during the ensuing year to definitely determine the best contour line, efficiency of operation and strength of the various parts, with a view of harmonizing the designs thus chosen

mittee did not feel like giving up the advantages dormant in the wedge lock principle, which is applicable to most coupler designs, nor did it desire that a wedge lock coupler be tried in service in general, hence it was decided to make and confine further experiments with this wedge principle under the direct supervision of your committee. 5,000 of each type of coupler was the number agreed upon for the tests.

HEIGHT OF COUPLER HEAD ABOVE centre line -The following were decided The hub of the knuckle shall be 8 ins. high. The height of the coupler head above centre line of coupler shank shall not ex ceed, for a locomotive coupler, 634 ins. for a distance of 6 ins. back of coupling line, and for a freight car coupler, 71/4 ins. for a distance of 6 ins. back of coupling line; but using same head as for locomotive coupler, the allowable increase (1/2 in.) in height for the freight car coupler is to provide for fe inforcement of junction of top coupler ear to coupler head. The head shall not be off set below centre line of coupler shank. The design of the coupler shank shall be the same in both experimental couplers. weight of the complete couplers, 6 by 8 in. shank, 91% in. butt, shall not exceed 400 lbs.
THE COUPLER SHANK, 6 BY 8 INS.

THE COUPLER SHANK, 6 BY 8 INST design shown by American Steel Foundries was accepted for the present; also that sub-

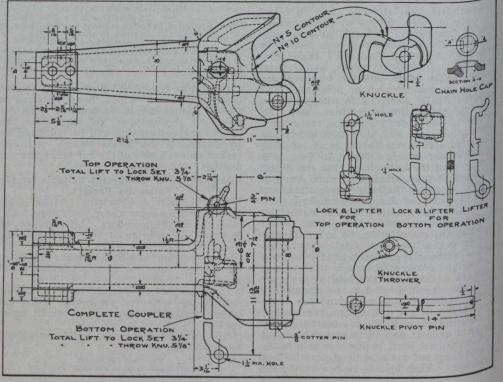


Fig. 1.—Experimental Standard M.C.B. Coupler A.

and eliminating any details that may prove unsatisfactory to the end of establishing the standard coupler. Accordingly, a joint conference was held with the coupler manufacturers.

The nine couplers submitted to your committee as embodying the joint specifications of design and which your committee exhibited at the 1913 convention, were taken to Altoona and mounted on operating racks for the purpose of studying each and to learn the effects of being in the weather. Each coupler submitted was taken up and each minute detail, both of design and operation, was considered and thoroughly discussed, and by carefully weighing all the points at issue it was decided to try two couplers shown in figs. 1 and 2. These couplers have straight locks and were selected for the general trial, but the com-

mitted by the National Malleable Castings

COUPLER BUTT, to be 9½ in., with 1½ in. vertical face for yoke gib, coupler rivel holes and general design same as present M. C. B. standard.

M. C. B. standard. KEY SLOT.—Uniform standard should be adopted.

adopted.
COUPLER SHANK, 5 BY 7 INS., to be the same as present M. C. B. standard, with the exception of the juncture of the shank to the head, which is to be in accordance with drawings submitted for the representative couplers.

COUPLER BUTT, same as present M. C. B. standard.

MARKINGS CAST ON THE TWO TRIAL couplers.—During the trial of the two select ed committee specification couplers it will