

3. The steel shall conform to the following limits in chemical composition:—

Carbon.....	Not over 0.60 per cent.
Manganese.....	0.40 to 0.80 per cent.
Phosphorus.....	Not over 0.5 per cent.
Sulphur.....	Not over 0.5 per cent.

4. Drillings shall be taken from the crop end of one axle, shaft, or similar part from each melt represented, parallel to the axis on any radius one-half the distance from the center to circumference, to determine whether the chemical composition of the heat is within the limits specified in Paragraph 3.

In addition to the complete analysis, the purchaser has a right to call for a phosphorus determination, to be made from turnings from each tensile test specimen, and the phosphorus must show within the limits called for by Paragraph 3.

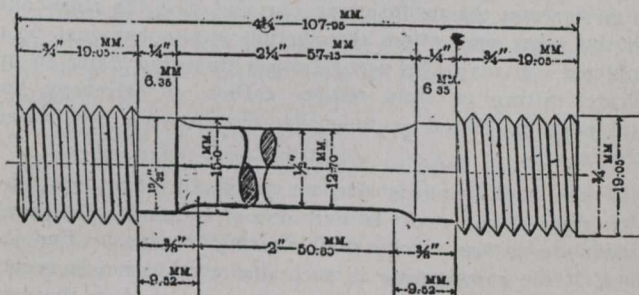


Fig. 1

5. The steel shall conform to the following minimum physical properties:—

Ultimate strength, lbs. per sq. in.....	85,000
Elastic limit, lbs. per sq. in.....	50,000
Elongation in 2 ins., per cent.....	22
Reduction of area, per cent.....	45

The elastic limit shall be determined by extensometer. Above 40,000 lbs. per sq. in., each increment of load shall not be more than 1,000 lbs. per sq. in.

6. The test specimen as shown by Fig. 1, 0.5-in. diameter and 2-in. gauge length, shall be used to determine the physical properties as specified in Paragraph 5. Tests specimens shall be taken from the crop end of one axle, shaft, or similar part, from each treating-plant heat; if more than one open-hearth heat is represented in a treating-plant heat, a test shall be taken from each open-hearth heat represented. A full-size prolongation shall be left on each axle, shaft, or similar part.

7. A cold bend test shall be made from the crop end of one axle, shaft, or similar part, from each treating-plant heat; if more than one open-hearth heat is represented in a treating-plant heat, a test shall be taken from each open-hearth heat represented. The test shall be made with 1/2-in. square specimen, not exceeding 6 ins. in length, around a flat mandrel with edges of 1/2-in. radius, and the specimen shall bend without fracture, 180 degrees around the said mandrel.

8. Specimens for tensile test and cold bend test shall be taken parallel to the axis of the axle or shaft and on any radius one-half the distance from the center to the circumference.

9. In case the physical results obtained from any lot of axles, shafts, or similar parts, do not conform to those called for by Paragraphs 5 and 7, the manufacturer shall have the privilege of retreating such parts, from which new tests shall be taken by the purchaser, and these shall govern the acceptance or rejection of the lot.

10. Each axle, shaft, or similar part shall be allowed to cool after forging, shall then be reheated to the proper temperature, quenched in some medium, allowed to cool, and then reheated to the proper temperature for annealing.

11. Warped axles or shafts or similar parts must be straightened hot; that is, at a temperature above 900 degrees F., and before offering the parts for test.

12. All axles, shafts, and similar parts shall be free from cracks, flaws, seams, or other injurious imperfections when finished. Those which show such defects while being finished by the purchaser will be rejected and returned to the manufacturer, who must pay return freight.

13. All axles, shafts, and similar parts must be rough-turned with an allowance of 1/8 in. on surface for finishing, except on collar, which is to be left rough forged. Turning must be done on 60-degree centers with clearance drilled at point.

14. The heat number shall be stamped on the rough forged collar. After rough turning, the manufacturer's name, heat number, individual axle or shaft number, and inspector's mark shall be stamped at place indicated by the purchaser, except at any point between the rough collars.

15. The inspector representing the purchaser shall have free entry, at all times while his contract is being executed, to all portions of the manufacturer's shop which concerns the manufacture of material ordered. All reasonable facilities shall be afforded to the inspector by the manufacturer to satisfy him that the axles, shafts, and similar parts are being furnished in accordance with the specifications. All tests and inspection shall be made at the place of manufacture prior to shipment and free of cost to the purchaser. The purchaser shall have the right to make tests to govern the acceptance or rejection in their own test-room, or elsewhere, as may be decided by the purchaser, such test, however, to be made at the expense of the purchaser and to be made prior to the shipment of the material. Unless otherwise arranged, any protest based on such tests must be made within six days, to be valid. Tests and inspection shall be so conducted as not to interfere unnecessarily with the operation of the mill.

THE HANDLING OF MEN.

The following, which is abstracted from a letter of G. O. Griffith, of Fort Flagler, to one of our contemporaries, is very much to the point:—

"In the management of men to get the best results the man in charge must have the respect of his men. To get their respect he must treat them as men who are in no way inferior to him except in the matter of work. There are many men who are working in a lower position than they really should be on account of some one higher up who does not appreciate their work and will not give them their just dues. Every chief should watch and study his men and when one shows that he is competent and deserving of advancement, the chief should give him what he deserves, and not show favoritism.

"Fair treatment will get better results than unjust treatment. Men dislike a person who is always 'cussing' and is 'grouchy' with them and they will not do as good work when he is away as they would if he were a man that was respected. Of course, there are some men who will not benefit by good treatment and with a man of that kind one has either to get rid of him or make him understand that he will have to do as he is required.

"Perhaps nothing will make a man slight his work more when he gets the chance than abusive language. And most men like to have their work praised occasionally."