load, — that is, a constant amount of work to be done. It is very seldom that an engine will be found that will give diagrams like these for several revolutions, because the load will vary. This is caused by throwing on or taking off work. The expansion curve should never cross the back pressure line as it does in the right-hand diagram of Figure 3, when the engine is doing its ordinary work; for if this is the case, the back pressure on one side of the piston is greater than the working pressure on the other side, and no effective work is done at that part of the stroke.

As the areas of these diagrams represent the amount of work done in each end of the cylinder, it will be seen that one end in Figure 3 was doing considerably more work than the other. The steam did not begin to enter the cylinder until the piston had started on its stroke, and hence the pencil could not rise in a vertical direction; but the admission line is a resultant of the vertical movement of the indicator piston and the horizontal movement of the engine piston. As the admission was late, the cut-off was also late. The exhaust and compression lines are very good. The engine is of the class known as the "automatic cut-off," having admission and exhaust valves independent of each other for each end of the cylinder. The difference in height of the diagrams of Figures 2 and 3 is partly due to the difference in the scale of the spring used. The scale refers to the height through which the pencil rises; that is, with a 30 spring, thirty pounds' pressure will raise the pencil one inch. A 40 spring requires forty pounds to raise the pencil one inch. The diagrams of Figure 2 were taken with a 30 spring, and those of Figure 3 with a 40 spring.

H. G. M.

For the benefit of members of the Institute our exchanges will be placed in the reading-room. Students will please not remove them from the room.

Fire in the forge shop recently; loss estimated at eighty-seven cents.

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**Mechanical Engineering.**

TWO boiler excursions within a week!

A friend suggests that a tasty sign in a conspicuous place in the "steam engineering laboratory" might relieve the anxiety of the uninstructed, who sometimes vainly seek for that department!

The number of students in the three years taking the regular Mechanical Engineering Course is now thirty-five, while but a few years ago the department had no representatives in the fourth year and only two or three in the third. This great gain, making it the largest of all departments in the Institute, shows clearly the increase of interest taken in the work of our course by those wishing to prepare themselves for an active life. A proof of the practical success of the course is given by the readiness with which our graduates obtain good positions soon after completing their work here. As shown by the catalogue, a large majority find opportunities for putting their knowledge and ability to immediate use in securing an independence.

At the last meeting of the Cotton Manufacturers' Association, Mr. Edward Atkinson wore one of the remarkable suits which were made at the Atlanta Exposition in nine and a half hours from the time the cotton was brought in from the field. At this meeting it was voted to present to the Mechanical Department of the Institute a series of models of arrangements for belting, exhibited before the Association.

The *Scientific American* says: It is a significant fact that in this country more boilers explode in establishments that use light fuel than in any other class of manufactories. It is probable that this results mainly from neglect of the safety valves, coupled with the great, sudden, and oft-repeated changes of temperature of the shell; the result of careless, excessive, and irregular firing, and perhaps the use of ice-cold feed water.