

SCIENTIFIC AMERICAN

A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY, AND MANUFACTURES.

Vol. XXXVII.—No. 13.
[NEW SERIES.]

NEW YORK, SEPTEMBER 29, 1877.

[\$3.20 per Annum.
[POSTAGE PREPAID.]

Self-Acting Car Couplers.

The coupling of cars need not always be effected by the use of a link and pins, but it must be remembered, says the *Railroad Gazette*, that in attaching cars together they must be entirely free, within certain limits, to move up or down or laterally, otherwise the attachments or the cars themselves will be broken. As there are very few mechanical devices which will furnish a secure attachment in one direction, and will yet allow this freedom of movement in others, it will be seen that if the simplest one of them is abandoned a new set of difficulties is encountered.

Now, besides all these, it must also be taken into consideration that the cars to which self-coupling arrangements must be attached vary very much in their construction. The height of their drawbars is not uniform, and their form differs more than their height. In the case of the machine for picking up screws, the latter were all exactly alike, whereas if they had been of different sizes and shapes the difficulty of handling them by an automatic machine would have been immensely increased.

It will be seen, then, that the problem of making a self-coupler, instead of being a very simple one, is in reality very complicated. In addition to this, the fact that the thousand or more inventors who have been engaged in attempts at producing a really practicable self-coupler are, the great majority of them, inexperienced mechanics, have no knowledge of drawing, which is the language of invention, and probably never coupled a car in their lives—when all these considerations are taken in mind, it will be apparent that there is no cause for surprise that nearly, if not quite, all of their work has been ineffective.

If there were a rule in the Patent Office that no application for a patent for a self-coupler would be received unless the inventor would first give proper evidence that he had been engaged for three months in coupling cars, there would then certainly be fewer applications received, and there is no doubt that those sent in would describe inventions of more merit than is possessed by those which are received now. As coupling cars is a dangerous occupation, there would, with such a regulation, probably be fewer inventors of car couplers left alive—a result which, we are inclined to believe, many railroad officers and some editors of railroad newspapers would not regret.

Speaking seriously, however, if inventors would direct their attention more to devices by which cars could be coupled without its being necessary for a

person to go between them, they would probably accomplish more than they have thus far. If, too, car builders would take steps to construct their cars so that a person in between them would be secure from accident and injury, they would do more to preserve lives and limbs than they will by dreaming over self-coupling expedients, although, doubtless, such arrangements, if practicable, are very much to be desired.

Preparation of Oxalic Acid from Parchment Paper.

The waste left after the manufacture of ordinary paper are, as is well known, reutilized for paper making, but the raw material which is used for the fabrication of parchment paper always furnishes after the sulphuric acid treatment a considerable quantity of refuse residue not fit for paper making nor yet suitable as a combustible. As however, the parchment paper is made from pure rags, Mr. C. O. Cech, in *Dingler's Journal*, proposes to use this waste material after lixiviation in caustic potash for the preparation of oxalic acid, for which he considers it better than sawdust or beet pulp.

VERTICAL COMPOUND ENGINE WITH ALLISON'S BOILER.

We give herewith a perspective view, from *Engineering*, of a vertical compound condensing engine, constructed by Messrs. John Fowler & Co., of Leeds, England, for Mr. John Allison, of Lancaster Gate, and a boiler constructed by Messrs. Fraser Brothers, of London, according to the patented designs of Mr. Allison. We also give, in Figs. 1, 2, and 3, page 194, sectional views of the boiler.

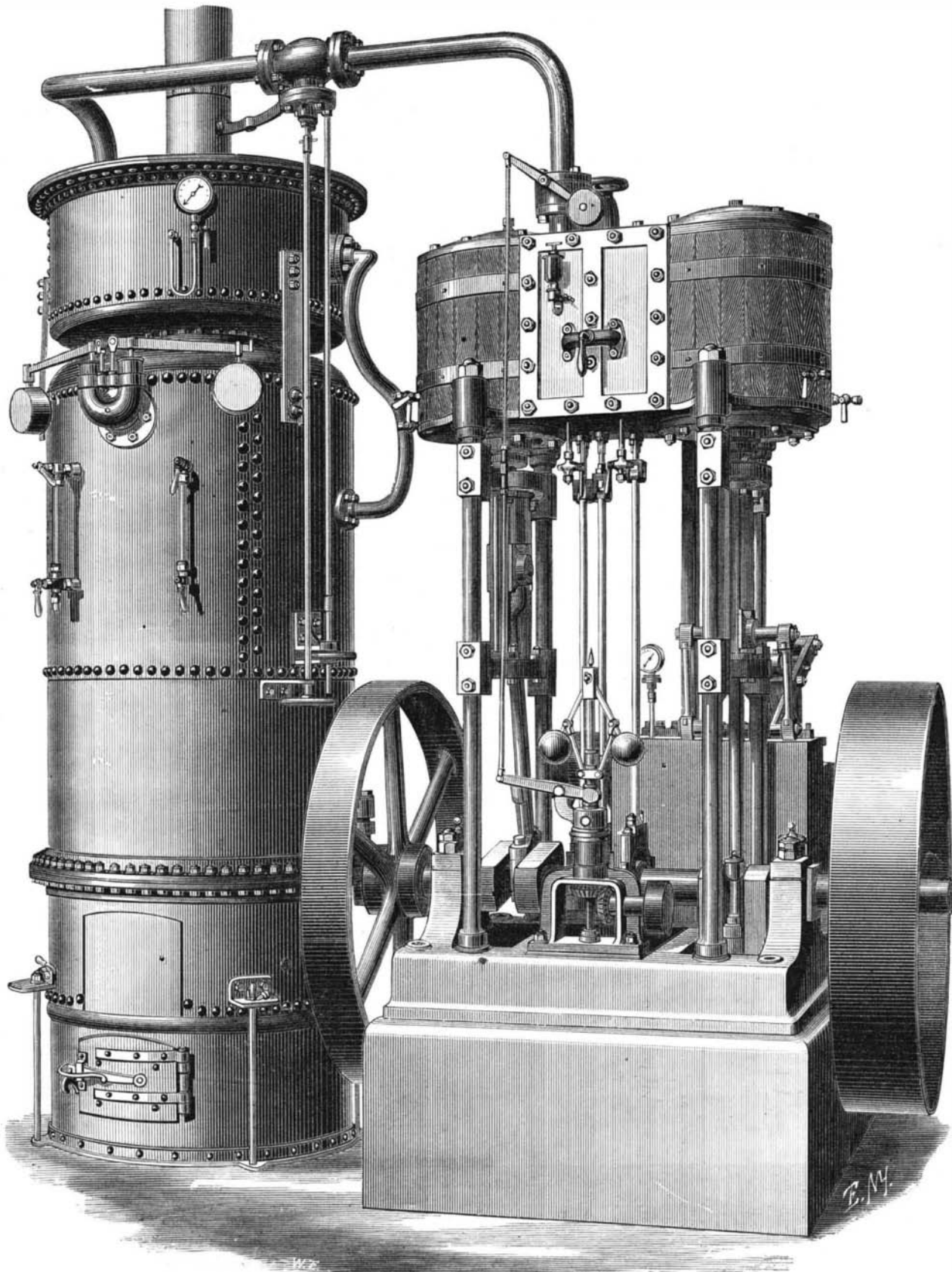
The engine is of the compound intermediate receiver type, the cranks being at right angles. The framing consists, as will be seen from the engraving, Fig. 1, of four wrought iron standards, 2½ inches in diameter, connecting the cylinders and bed plate, these standards being each made square at two points in their height to facilitate the attachment of the stays which carry the guide bars. The cylinders are both steam jacketed, and they are 9 inches and 15 inches in diameter respectively, the stroke of both pistons being 1 foot 4 inches. The engines are intended to be run at a piston speed of 400 feet per minute. The small cylinder is fitted

with an adjustable expansion valve at the back of the main slide, while the low pressure cylinder has a single valve only. The air pump is vertical, and is worked by levers connected to the cross-head of the low pressure piston.

The boiler is of a type designed and patented by Mr. Allison. As shown in the sectional views, the fire is contained in a chamber lined with fire-brick and situated below the boiler, this chamber forming a prolongation of the internal firebox. The air on its way to the fire-grate passes down between the exterior of this chamber and an annular brick pier on which the boiler is supported. Holes are formed in the sides of the furnace chamber for the admission of air above the fire if required. This arrangement of brick-lined furnace is one well adapted to secure good combustion, but we may remark that Mr. Allison does not propose to employ it in all cases, it being intended that the grate should, in the majority of instances, be fitted at the bottom of the firebox in the usual way.

As shown in the vertical section, a series of bent tubes extend from the sides of the firebox to the crown, these tubes being disposed in four rings, as shown. The firebox is surrounded by an annular diaphragm plate for the purpose of separating the upward and downward currents, and thus promoting circulation, while at the upper ends of the bent tubes deflectors are placed, as shown.

[Continued on page 194.]



VERTICAL COMPOUND ENGINE AND BOILER.