

THE DEMENGE ENGINE AND BOILER.

Our illustrations, which we take from *Revue Industrielle*, represent a compound steam engine and boiler, constructed by Mr. Demenge, and received with much favor in France. Fig. 1 shows a stationary engine. The steam enters the smaller high pressure cylinder first, expands partially and then passes into the larger cylinder, where the expansion is completed. Pressure is exerted only between the exterior head of the cylinder and the pistons, and not on the inner surfaces of the latter. The cylinder heads and the pistons are partially covered with lead, which, being a poor conductor of heat, diminishes condensation.

The connecting rods being subject to compression only, and acting in opposite directions on the shaft, may be made of cast iron, and the cranks may be smaller than in ordinary engines.

The velocity of this engine may be greater, and consequently a larger amount of work may be accomplished than by other engines of similar dimensions. The condenser pump has no exhaust valve, but its piston is connected with that of the low pressure cylinder in such a manner that it acts only during one quarter of the revolution, commencing just when the action of the piston of the large cylinder on the crank and shaft ceases. The cylinders and valves are so proportioned that the pressure on the pistons remains the same throughout the stroke, no matter what may be the degree of initial pressure and expansion in the high pressure cylinder. Tight joints placed at each side of the shaft prevent the air from entering the large cylinder.

The shaft is made of steel; the surface subject to friction is rather large, and is automatically lubricated.

The regulator does not act on the distributing mechanism directly, but operates on a separate valve. Fig. 2 shows the engine combined with a portable boiler, for agricultural purposes. Although rather clumsy and more complicated than desirable in agricultural machines, it is yet said to recommend itself by its economy in regard to fuel.

The boiler, of which Fig. 3 shows sectional views, is of the Thomas-Laurens type, and is placed in oblique position; this is done to prevent any water from being carried along with the steam and to facilitate the attachment of the tongue. Fig. 3 illustrates the position of the tubes, which are partly surrounded by water, partly by steam.

Chinese Dentistry.

It is well known that the Chinese attribute toothache to the gnawing of worms, and that their dentists profess to take these worms from decayed teeth. But how they performed this trick, and so artfully concealed it in the hurry of daily business, was a secret only recently solved by a European inquirer. After some difficulty and delicate negotiation, an intelligent looking native practitioner was induced to hand over the implements of his trade, together with a number of the worms, and to give instructions in the method of procedure. When a patient with toothache applies for relief, if the tooth is solidly fixed in the socket, the gum is separated from it with sharp instruments and made to bleed. During this operation the cheek is held on one side by a bamboo spatula, both ends of which are alike, and on the end held in the hand some minute worms are concealed under thin paper pasted to the spatula. When all is ready, this is adroitly turned and inserted in the mouth, and the paper becoming moistened is very easily torn with the sharp instrument used for cutting the gums; the worms mix with the saliva, and the dentist, of course, picks them out with a pair of forceps. The patient having ocular demonstration that the cause of the disease has been removed, has good reason to expect relief, which in many cases would naturally follow the bleeding of the gum. When the pain returns, the same operation is performed over again, and a fresh supply of worms fully accounts for the recurring trouble. These worms are manufactured in quantities to suit the trade, and they are very cleverly done; still, to carry out the delusion fully, the dentists are obliged to keep on hand a few live worms to show their patients, explaining that most of those taken from the tooth are killed either by a powder which is often applied, or by the process of removing them with the forceps. This is resorted to when the tooth is firmly set.—*Chambers' Journal*.

Telegraph Messages through Metallic Tubes.

When the plan of delivering messages through tubes from the main telegraph building in this city to the most important business marts was first adopted a description of the tubes and operation of the pneumatic arrangement was described in the *SCIENTIFIC AMERICAN*. More recently an ac-

Stock Exchange and the branch telegraph office there, and other pipes down to the Cotton Exchange and to the branch office near by there. These were pneumatic tubes, 2½ inches in diameter. They were four in number—two of them "up" tubes, as they are called, worked by exhausting the air and making a vacuum, and two of them "down" tubes, worked by pressure. The messages were rolled up thereafter and placed in little leather boxes, open at one end, and about 6 inches long, and shot back and forth between the main and branch offices, instead of being sent by messenger boys or telegraphed over the wires. The company is now exchanging from 3,000 to 4,000 and more messages a day, through their pneumatic tubes, between the main office on Broadway and the branch offices at and near the Stock and Cotton Exchanges. It saves thereby the labor of at least 25 telegraph operators, and the public is saved much expense.

The tubes are, two of them, 2,100 feet long (the Wall street tubes), and two are respectively 3,000 and 3,500 feet long. They are worked by a steam engine, which has a capacity of 75 horse power, but which is never called upon for half its resources. An engineer and four boys at the tubes are all the employes needed in place of the 25 skilled operators.

This system has worked so well in the business emanating in the commercial and financial quarters of the city, that it is to be extended to Printing House Square, connecting with the offices of the principal newspapers.

New Inventions.

An improved apparatus for use in photographic galleries as an accessory in forming backgrounds for pictures has been patented by Mr. William F. Ashe, of New York city. It is so constructed that it may be arranged as a staircase, a balustrade, or a pedestal, as may be required.

Mr. John A. Caldwell, of Brownsville, Tenn., has patented an improved Compound Beveling Instrument for the use of stair builders, carpenters, millwrights, and others, by which complicated cuts, such as the pitches of handrails and bevels of jack rafters, are easily obtained.

An improved Attachment to Stemwinder Watch Cases has been patented by Mr. Joseph Fortenbach, of Carlstadt, N. J. The invention consists in a perforated metallic plate fitted upon the winding stem and interposed between the lock spring and the center ring of the watch case, to operate the spring at one side of and out of contact with the stem.

Mr. Gilbert W. Bradley, of Sunderland, Vt., has patented an improved Wooden Box. The process consists in bending wooden veneers into tubular shape under successively decreasing arcs and increasing pressures, and sewing together the lapped edges.

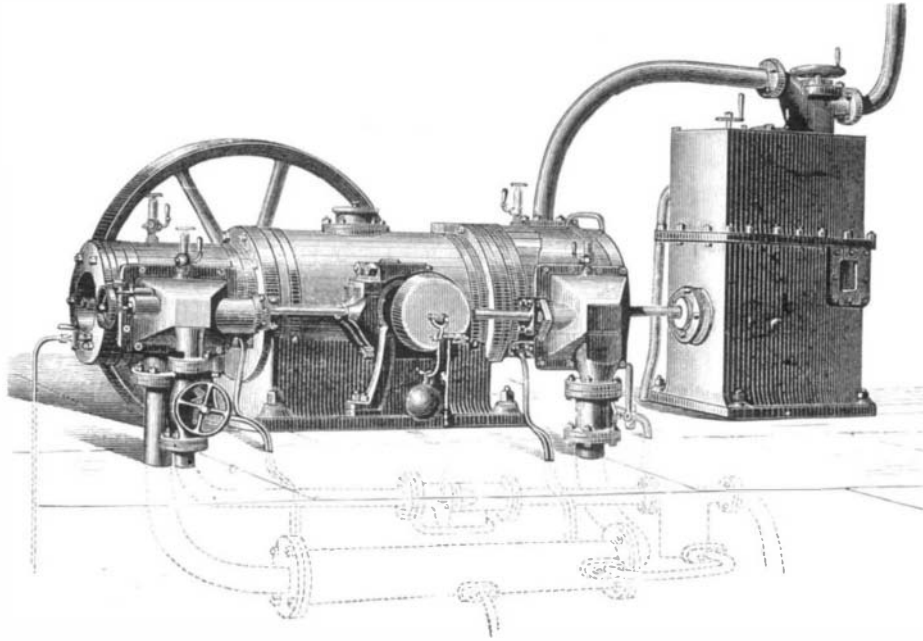
Messrs. Hiram D. Jewett and Israel D. Jewett, of St. Omer, Ind., have patented an improved Mechanical Telephone, which is so constructed as to receive the full volume and force of the voice and other sounds, magnify them, and transmit them to the instrument at the other end of the line with distinctness, so that they can be clearly heard at considerable distance from the instrument.

Mr. Lawrence Klemm, of Terre Haute, Ind., has patented an improved Apparatus for Cleaning Middlings by means of a force and suction draught.

The device is of simple construction, and requires less power than the complicated machinery at present employed for separating the middlings from the lighter particles.

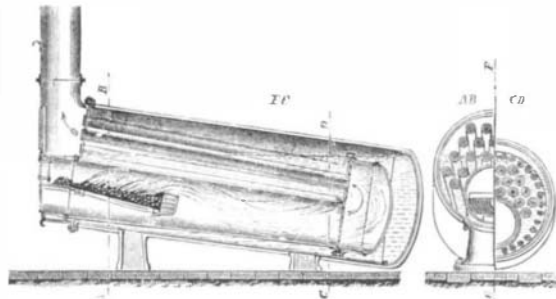
Mr. Marshall R. Dowlin, of North Adams, Mass., has patented an improved Attachment for Flexible Leather Covered Horse Collars of double harness, for the purpose of protecting the throat of or lower end of the collars from wear, and from being drawn or bent out of shape by the tension of the pole strap.

Mr. Wm. H. Hubbard, of Red Bank, N. J., has patented an improved Gate, which consists of metal or wooden bars supported at one end in a post having a friction roller at the bottom running on a rail, and at the opposite end entered into metal or wooden tubes placed in or constituting the adjoining panel of the fence, so that when the gate is opened the rods of which it is made slide or telescope into the tubes of the adjoining panel.

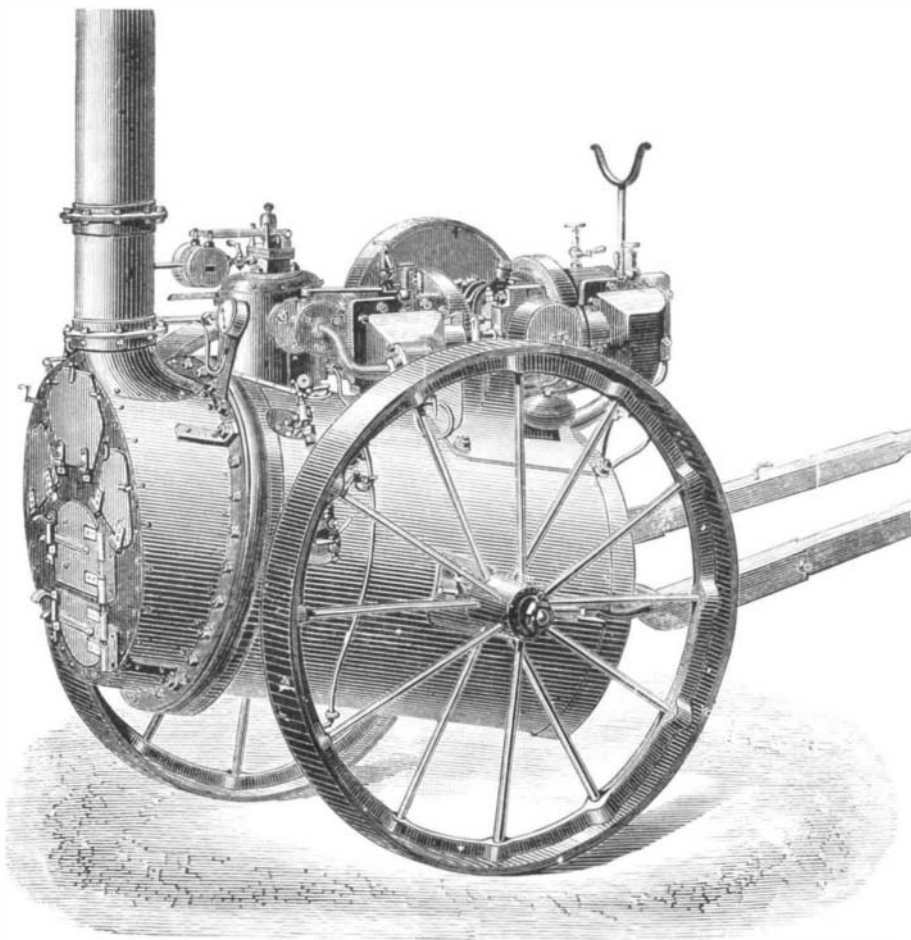
**Fig. 1.—STATIONARY DEMENGE ENGINE.**

count of the success of the enterprise has been published in the *Philadelphia Press*, from which we copy:

Great are the economies of machinery, commences the writer. Two years ago the Western Union Telegraph Company came to the conclusion that the business of getting

**Fig. 3.—THOMAS-LAURENS BOILER.**

messages from the main office on Broadway to Wall street and back was costing the company and the public more than necessary. In order to cheapen the expense of the large volume of business emanating in that part of the town, the company laid brass pipes, properly protected from the moisture, down Broadway and Wall and Broad streets to the

**Fig. 2.—PORTABLE DEMENGE ENGINE.**