

SCIENTIFIC AMERICAN

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

Vol. XXXI.—No. 19.
[NEW SERIES.]

NEW YORK, NOVEMBER 7, 1874.

\$3 per Annum.
[With Postage, \$3.20.]

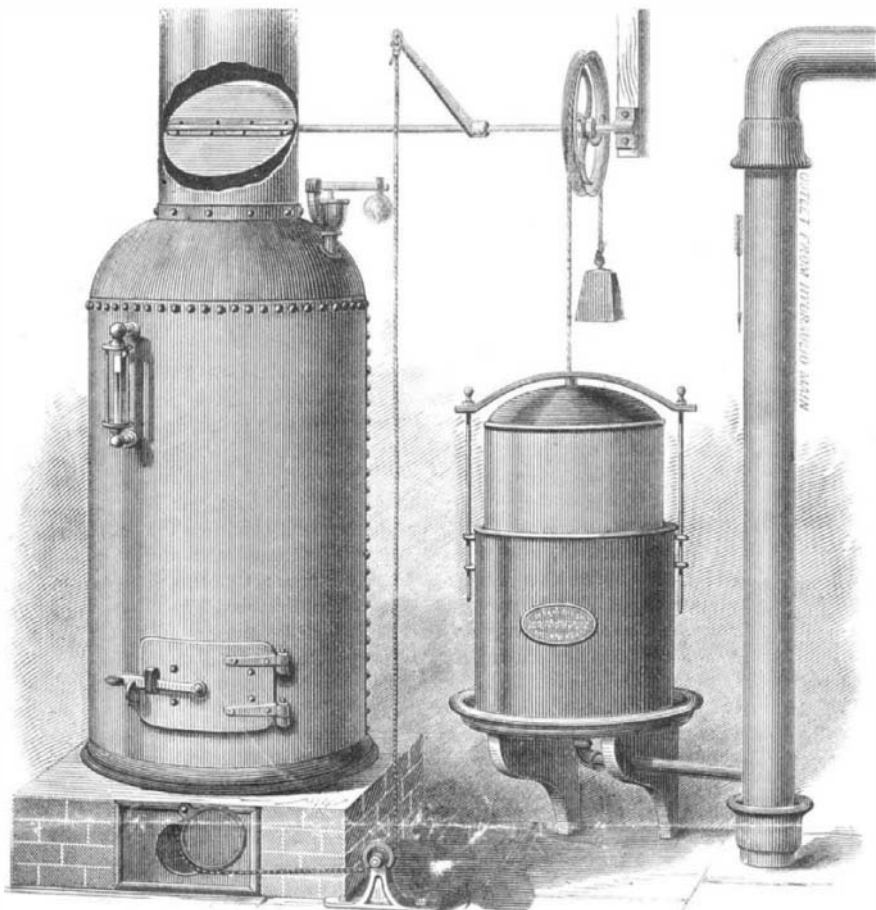
AUTOMATIC FIRE GOVERNOR FOR GAS WORKS.

The invention illustrated in the annexed engraving consists in a common gas governor, connected with the outlet of the hydraulic main, and also with the dampers in the chimney and under the fire. The arrangement is such that as soon as the engine does not exhaust fast enough, a slight pressure, being left on the retorts, is communicated to the governor, causing the latter to rise, thus opening the dampers at both of the above named points, and putting on all draft until the requisite speed is obtained. The pressure then being removed, the drum descends, closing the dampers, and preventing the fire making more steam until a future supply is once more required.

The disposition of the simple mechanism is clearly shown in our illustration, so that detailed reference to the various parts is unnecessary. It will be seen that, as the governor is controlled by the pressure of gas on the hydraulic main, the amount of steam will vary, according to the make of gas—whether it be ten, fifty, or a hundred pounds—and all without any attention on the part of the men, except to replenish the fire.

The Yonkers (N. Y.) Gas Light Company have had the apparatus in successful operation for several months past, where it can now be inspected. It is claimed to dispense with the engineer in many places, besides performing his work in a better manner; to save fuel, as burning to waste is prevented; to preserve the boiler, since the door need not be opened except when the fire requires renewal, and to obviate the use of compensators and engine governors.

The invention was patented through the Scientific American Patent Agency, August 4, 1874, by Mr. James Slade, of Yonkers, N. Y., who may be addressed for further information.



SLADE'S AUTOMATIC FIRE GOVERNOR FOR GAS WORKS.

IMPROVED COAL SCREEN.

The invention which we illustrate herewith will be found a very convenient device for use in coal yards, since it allows of the separation of the coal from the adhering dust and small particles with much less trouble to the workman than is necessitated in employing the ordinary screen. It consists of a box having an inclined open front portion for the reception of the screen, which last is supported by the projecting ends of its side pieces resting against the bottom portion of the box, while its upper part is sustained by levers, A. These levers are pivoted to the side walls of, and inside, the box, and are adjustable so that the screen may be inclined to any angle, as required by the quality and size of coal, ore, sand, or other material to be treated.

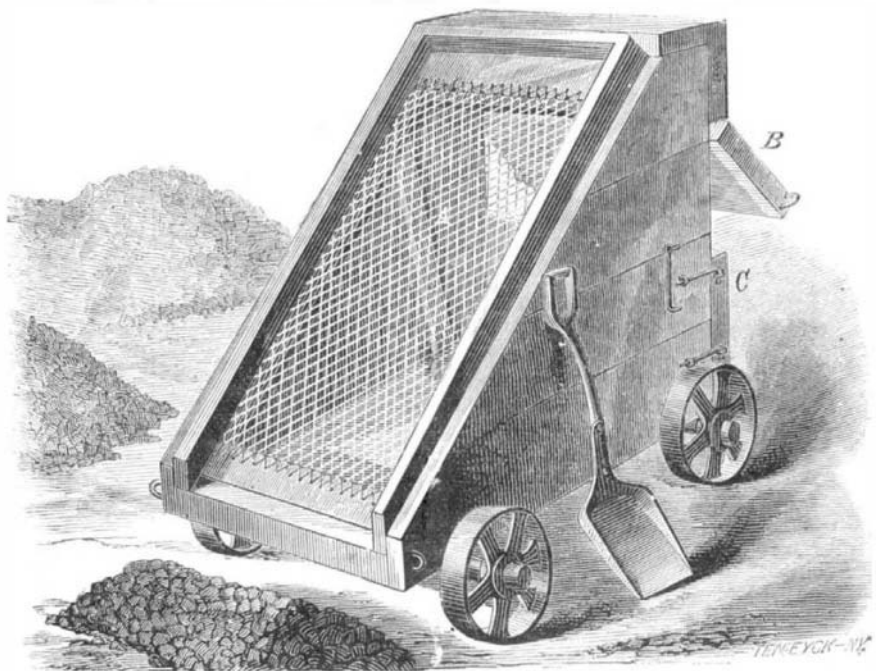
The rear portion of the box has an upper hinged door, B, which is provided with suitable latches, and there is also a detachable door, C, secured by hooks and staples or other convenient fastenings. The apparatus is mounted upon trucks, so as to render it readily transported from point to point in the yard.

As the material is thrown against the screen, the fine stuff falls through and into the bottom of the box. When a quantity has accumulated, the upper door, B, is opened, and a rake is introduced to draw the screenings to the rear of the receptacle. As soon as the latter is full, the device is wheeled away to the dumping spot, the lower door also removed, and the contents withdrawn.

This simple arrangement prevents the laborious carrying of heavy screens about a yard, and, besides, preserves the yard free from unsightly heaps of dust and refuse to collect. Since there is no possibility of anything passing through the screen, except small fragments, the waste of good coal—which often happens through pieces from the screened heap becoming mixed with the sifted stuff, and requiring too great a loss of time to pick out separately—is avoided.

The doors may be arranged at the side, or a trap may be provided at the bottom, as most convenient.

Patented through the Scientific American Patent Agency, by Mr. Henry L. Leach, of foot of E. 36th street (E. R.), New York city, who may be addressed for further information.



LEACH'S COAL SCREEN.

Consumption of Wood by Railroads.

At the end of 1873, there were reported 71,564.9 miles of main lines, and 13,512 miles of sidings and double tracks, making 85,977.9 miles of railroads within the United States. Of the main lines, 5,462.3 miles were in the New England States, 14,209 in the Middle States, 33,905.9 in the Western

States, and 2,481.3 in the Pacific States. Upon these roads locomotives were running, and a large proportion of them used wood for their fuel. The number of ties used varies from 2,200 to 2,800 per mile. If we take 2,500 as a mean, we find that 212,692,500 pieces of timber, eight feet long and from six to eight inches between upper and lower surfaces, are required to supply this single item.

The durability of ties varies with the kind of timber, soil, climate, and use, ranging from four to ten years. Taking six as an average, the amount required for annual supply must be 35,448,750 pieces, or 94,530,000 cubic feet. In con-

sidering this, we must remember that a large amount of waste occurs from hewing, and from leaving the upper parts of trees, some of which are used as firewood, the remainder being a total loss. It must also be borne in mind that the demand for timber by railroads, besides for ties and for fuel, is very great, including fencing, bridges, buildings, and structures of various kinds; that the risk from fires is exceptionally great, and that our requirements in this direc-

tion are increasing even more rapidly than our supplies are wasting.—*National Car Builder.*

A New Plaster Bandage.

A surgeon connected with the Southern Dispensary, in Brooklyn, N. Y., has recently invented a new method of applying the plaster splint, which, according to the *Tribune*, promises to be an important improvement. A common merino sock is drawn upon the foot and leg. It may extend as far up as is necessary to include the fractured locality. A small rope is run down the back seam in the center of the leg, around the heel and over the toes, returning up the middle of the instep and front of the leg. Six or seven pieces of flannel are then cut out to fit the leg and foot, allowing for shrinkage. The ends of the bones having been carefully adjusted, the stocking, upon which the rope has been attached as described, is drawn upon the foot and leg. The flannels are soaked in warm water and applied, the plaster of Paris paste being rubbed in with layer after layer. After the last layer has been applied, the plaster is allowed to set. When the plaster has become hard, the splint is perfect, and the patient can get about, on crutches, very comfortably. If the leg swells, and it is necessary to remove the bandage, the whole thing can be done inside of three minutes. The cord that has been run around the stocking now forms a line of division in the splint. To remove the splint, all that has to be done is to slip out the cord and slit up the stocking along the line where the cord was. Then the splint, divided in halves, can be removed as though it had been laid upon the limb to obtain a cast. Considerable time is thus gained by using this method of applying the plaster splint. When the broken limb becomes inflamed, it also is extremely painful and very tender to the touch. The slightest jar sends a thrill of pain through the body of the patient, who has sometimes been obliged to be chloroformed to enable the surgeon to remove a plaster splint applied with a bandage. By the new method, the limb need hardly be moved or touched.

Natural Gas for Fuel.

Messrs. Rogers & Burchfield, the makers of a well known brand of sheet iron, at Leechburg, Pa., produce weekly about 70 tons of such iron; to make this amount 9,100 bushels of coal, or 140 bushels per ton, would be required if they used coal for fuel. They have now been using gas for seven months, procuring it from an abandoned oil well, 1,250 feet deep, situated about 1,000 feet from the works, and from which the gas is conveyed by a three inch pipe. The branch pipes leading to each furnace are half an inch in diameter. They have one battery of four boilers, driving an engine of six foot stroke, thirty inches in diameter, at the rate of forty-five strokes per minute, which furnishes power for six pairs of sheet rolls and one bar train, steam being taken from the same boilers to drive two hammers; another boiler furnishes steam for a blowing cylinder, which supplies the blast for seven knobbling fires and onerefinery; another boiler furnishes steam for a small engine driving the rolls for the manufacture of tin plate. This is all done by gas, which is also applied directly in five puddling furnaces, in which the waste is three or four per cent less than with coal, and the quality of the iron is greatly improved; they also furnish gas for four sheet furnaces, and find it much superior to coal, the waste in these furnaces being about five per cent less than with coal; and further advantages gained are softer iron and a finer surface to the sheet. They have three large annealing furnaces, where they anneal in airtight boxes, putting about ten tons in each box, requiring about ten hours

to complete the process of annealing, at a saving of about one half in annealing boxes; and in the tinning establishment the pots of tin, into which the sheets of iron are dipped, are also heated by gas.

To use gas there is no change required in the construction of puddling furnaces, except that they use the patent water necks. These necks are an absolute necessity in using gas for fuel, as without them the intense heat, generated by the