

**Improved Steam Heating Apparatus.**

The accompanying engraving represents the steam heating apparatus, patented July 18, 1871, by F. H. Pulsifer and Wm. C. Wheeler, of Baltimore, Md.

A B C D represents the outer shell, made in four sections and bolted together. The lower section, A, rests upon the brick ash pit, E, and is provided with a grate, F, separated by the hollow partition, G, inclined as shown. Through this partition is cast a number of tubes, H, for the passage of air to the fires, thereby producing a more perfect combustion of the fuel. By means of this partition two separate fires may be made, and, if preferred, only one grate or side may be used, thereby saving one half the amount of fuel. In this section is arranged the furnace door, I, which is of the ordinary construction. The sections, B and C, are provided with eight pipes or tubes, J (through which the water circulates), inclining and joining in the center, and bolted together through the center by the bolt, K. A water space is thus left all around the tubes.

In the engraving two of the sections, with flues or tubes, are shown; but for a larger boiler, as many sections as desired can be used. The pipes, J, in each section, may be set around or advanced, as shown in the engraving, thereby obtaining a greater heating surface.

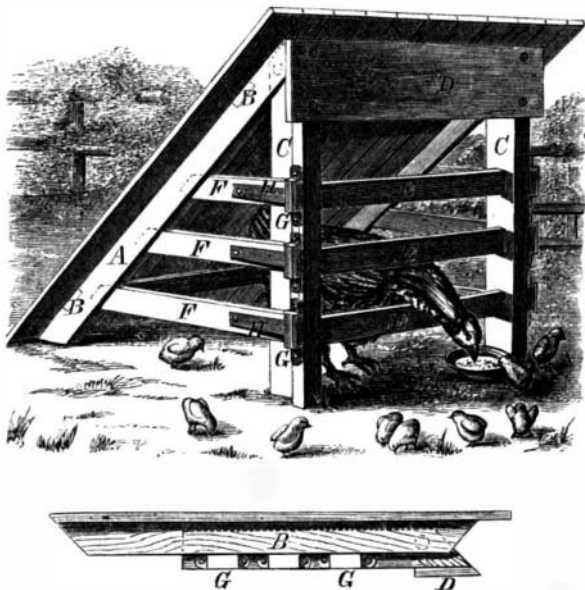
In the top section, D, forming the dome or steam drum, are arranged four flues or pipes, L, running at right angles to each other, thereby obviating the necessity of elbows as heretofore used. M is the steam pipe connection. The sections are all connected between the inner and outer shell, forming the water space, N, by the openings, O. The front of the ash pit is of cast iron, and is fitted with ash pit doors, P. The advantages claimed for this apparatus over others heretofore used are, that a better circulation of the water is obtained, as well as a greater amount of heating surface; the water, being in the hollow partition in close proximity with the fire, is sooner heated, and, if desired, only one of the fires may be lighted, thereby saving one half of the fuel. A more perfect combustion of the fuel is also claimed; the outlets or escape flues having no elbows, the smoke is sooner got rid of; by bolting the pipes together in the center, greater strength is given the boiler. And it is claimed that, by including the tubes, they are not so liable to be cracked or broken in contraction or expansion, nor to hold the sediment contained in the water. And by arranging the tubes or pipes, as shown in the engraving, all the heat passing from the furnace or fire must come in contact with some portion of the heating surface, before passing out to the chimney.

The boiler is designed not only for heating but for other purposes.

For further information or for purchase of State rights, address Frank H. Pulsifer, Milwaukee, Wis., or Wm. C. Wheeler, 679 Lexington street, Baltimore, Md.

**WILCOX'S FOLDING HENCOOP.**

To raisers of poultry and farmers in general, the invention we herewith illustrate will possess interest. It is a folding chicken coop, which may be closed together in small space for storage or transportation, and is constructed as follows:



The inclined bars, A, are held parallel to each other by crossbars, B, which, with the inclined bars, support the roof. To the upper ends of the bars, A, are pivoted the uprights, C. The latter are rabbeted on the outside, so that when the coop is folded they partly overlap the bars, A, as shown in detail at the bottom of the engraving. To the outer sides of the upper ends of the bars, C, is attached a board, D, the ends of which project and rest against the ends of the bars, A, as shown.

The edge of the board, E, and the ends of the bars, C, as also the edges of the shoulders of the bars, C, are beveled off so that the coop may stand firmly when set up.

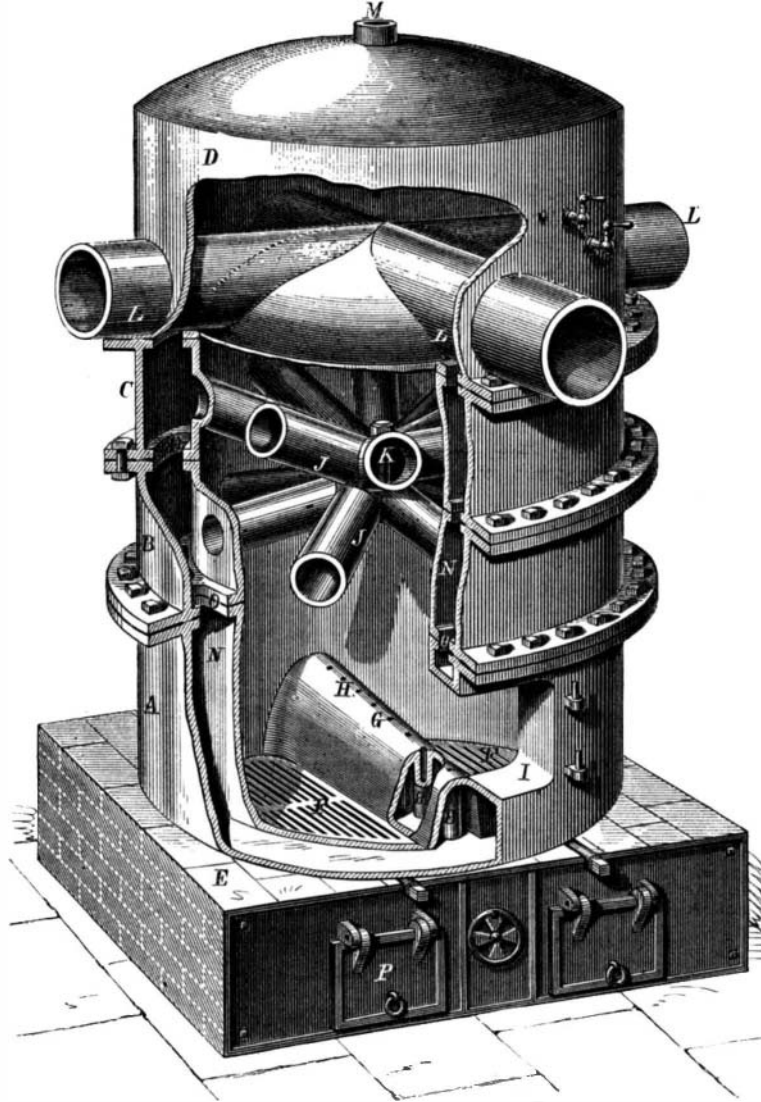
To the bars, C, and at a proper distance from each other,

are attached crossbars, E. The side bars, F, are slid in through keepers, G, and are held in place by spring catches, I, which engage the keepers, as shown. The inner ends of the bars, G, enter mortices in A, as shown in dotted outline.

When taken down and folded, the parts assume the position shown in detail at the bottom of the engraving.

The invention was patented through the Scientific American Patent Agency, Nov. 14, 1871, by Edward J. Wilcox, of Ivy Mills, Pa., who may be addressed for further information.

**ANTS AS ENGINEERS.**—It appears that the ants in Panama are not merely mining engineers—they build tubular bridges.



**PULSIFER & WHEELER'S STEAM HEATING APPARATUS.**

A corresponding member of the Glasgow Natural History Society, who has been lately in that country, describes the curious covered ways constructed by these ingenious insects. In tracing one of these covered ways, he found it led over a pretty wide fracture in the rocks and was carried across in the air in the form of a tubular bridge of half an inch in diameter. It was a scene of busy traffic. There was nearly a foot of unsupported tube from one edge of the cliff to the other.

**Toothache, Earache, Etc.**

The little work noticed in another column, entitled "First Help in Accidents," speaks of these complaints, so prevalent at this season of the year, as follows:

"It is a bad practice to put cotton wool, soaked in laudanum or chloroform, into the ear for the relief of toothache. It is true that it may sometimes prove effectual, and procure a night's rest, for the connection between the teeth and the ear is very close. But let it be borne in mind that the ear is far too delicate and valuable an organ to be used as a medium for the application of strong remedies for disorders of the teeth, and that both laudanum and chloroform, more especially the latter, are powerful irritants, and that such applications are always accompanied with risk. The teeth should be looked after for themselves, by some competent dentist; and if toothache spreads to the ear, this is another reason why they should be attended to at once; for prolonged pain in the head, arising from the teeth, may itself injure the hearing. In earache everything should be done to soothe it, and all strong irritating applications should be avoided. Pieces of hot fig or onion should on no account be put in; but warm flannels should be applied, with poppy fomentation externally, if the pain does not soon subside."

**Clark's Locomotive Engine.**

John Clark, M. E., of 44 Finsbury Circus, in the city of London, England, has recently patented, through the Scientific American Patent Agency, an improvement in locomotive engines, the object of which is to radiate the leading and trailing axles of locomotive engines, or of engine and tender combined, to enable them to pass round sharp curves more freely.

He constructs the leading and trailing axles hollow, inside of which he fits a central spindle, to which are fitted, at each end, cranks in connection with the driving gear. The hollow axles may be called the carrying axles, and the central spindles, the driving axles. The centre part of the spindles may

be square or hexagonal, to fit freely a bush fixed at the center of the hollow axle, so that it may slide therein. Thus, when the spindle is driven, the carrying or hollow axle will be driven with it.

The radial movement of the hollow axles is effected by links fixed to the framing. The spindles are carried in bearings in the framing, and are held in a parallel plane with the other axles of the engine by horizontal rocking shafts. The engine may have eight, ten, or even twelve wheels coupled and propelled by one pair of cylinders, either outside or inside.

One purpose effected in the design is to make the load moderate on all the wheels—say not to exceed nine tons per pair—and to include all the weight for adhesion. In the eight wheeled engine, the four wheels in the centre form a fixed or parallel wheel base from seven to ten feet centers.

The leading and trailing axles radiate freely to pass curves of three chains radius. In the ten wheeled engine the six wheels in the centre form a fixed or parallel wheel base, the middle pair being without the flange. In the twelve wheeled engine the six wheels, situated immediately behind the leading axle, form a fixed or parallel wheel base from nine to twelve feet centres, and the leading and two trailing axles are fitted with the radial arrangement.

The load carried by the radial axle is entirely borne by a transverse spring or springs from a pin in the center buckle, supporting slings from a bracket fixed to the framing or boiler. Either wheel of the leading and trailing axles is free to rise or fall about an inch and a half, to suit the "cant" or inequalities of the rail, without imparting any cross twist to the framing, thereby securing the advantages of the American bogie as applied to engines. The said supporting slings have a double fulcrum pin, where they are joined to the supporting brackets, to secure a certain amount of righting to make the engine run smooth and steady on a straight road.

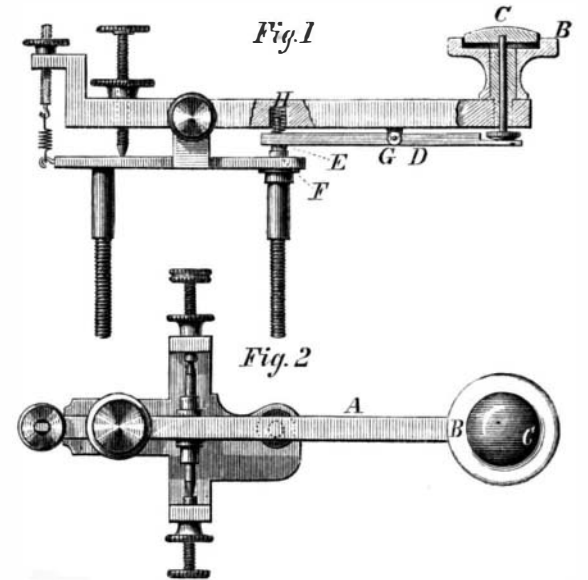
The details of Mr. Clark's invention cannot well be explained without drawings, but the general description given will enable engineers to comprehend in some measure the nature of the improvement.

**SELF-CLOSING TELEGRAPH KEY.**

This telegraph key, which was patented through the Scientific American Patent Agency, Nov. 7, 1871, by Jeremiah F. O'Sullivan and Philip W. O'Sullivan, of Jackson, Miss., is so constructed as to hold the circuit constantly closed, in order that it may not be accidentally left open by careless and inexperienced operators.

To this end there is applied to the ordinary key bar, A (see engraving) a secondary button, C, in addition to the ordinary one, B, in connection with the lever, D, and spring, H, the latter holding the lever in constant contact with the conductor, unless it is lifted off by pressure on the secondary button.

The second button, C, is fitted upon a pin or shank, which passes through the button, B. The lever, D, is pivoted to the under side of the bar, A, at G. The spiral spring, H, holds the pin or hammer, E, in contact with the anvil, F, thereby closing the circuit.



The instrument can be worked perfectly, without grasping the button with thumb and fingers, by operators who do not use the thumb in writing. The improvement can be adapted to all keys at very little expense, and new keys can be made as cheap as the old.

The key is very convenient to inexperienced operators. Accidents that would open a common key will have no effect on this. The spring, so sensitive to the touch which closes the circuit, would require a nicely balanced weight to keep it open without bearing down the key bar and connecting the platina points on the hammer and anvil.

For further particulars, address O'Sullivan & Brother, Jackson, Miss.