

**Improvement in Farm Gates.**

Nothing is more unsightly around a farmer's house than a dilapidated farm gate. Many improvements have been patented, but the one illustrated herewith is among the latest. As these modern gates have been adopted by farmers a vast improvement in the appearance of country homes is apparent. The gate shown in the annexed engraving is claimed to possess advantages not to be found in any other in use.

Fig. 1 shows this gate partially opened; and Fig. 2 shows it entirely opened, and held from closing by a latch. In Fig. 1, if the gate should be slid to the left it would meet the post, A, and the latch, B, engaging with the post would fasten it shut. When partially opened, the gate rests on a block, C, at the middle of the bottom, with a notch at the top to admit the bottom rail of the gate, the first motion in opening being a sliding to the right.

It has a wooden hinge bar, D, composed of two pieces of timber playing on each side of the gate, with a gudgeon or hinge pin, E, at the top and a similar one at the bottom. This hinge bar stands at the angle shown in Fig. 1, when the gate is closed, and remains in that position until the middle vertical bar of the gate meets it as the gate is slid open.

A roller, F, between the two parts of the hinge post, D, allows the gate to be slid back to the position shown in Fig. 1 without disturbing the position of D. A cord running from the post, G, to the top of D, limits the inclination of the latter.

In opening the gate after it has reached the position shown in Fig. 1, it engages with the hinge post, D, the bottom of which is held by, and plays in a step H. The hinge post is then thrown back to a vertical position, lifting and carrying the gate with it until the gudgeon, E, enters a slotted bearing, I, nailed on to the tops of the posts G and I. These posts are not set one directly in front of the other, but one a little to one side of the other to allow the gate to swing between them.

As soon as the hinge post, D, reaches the vertical position the gate is balanced on its center of gravity, and may be rotated upon D until it reaches the position shown in Fig. 2, in which it is held by the latch L.

Fig. 2 shows by the dotted lines the first position of the gate and also exhibits the positions of the different parts when the gate is fully opened.

The hinge post, D, may be made of a proper length to elevate the gate above snow in winter, and the gate may be unhung as readily as gates with the common hinges. Nothing but wood and common nails are employed in its construction.

Patented April 27, 1869, through the office of the SCIENTIFIC AMERICAN, by J. T. Moxley, whom address for further information at Owosso, Mich. See advertisement on another page.

**Suspension Bridges.**

In the construction of suspension bridges, the ties, or ropes from the main cable, sustaining the roadway, are of twisted wire as well as the main cable. With the alleged advantages of twisted wire ropes, for this purpose, over straight iron rods, I am not aware that the less expansion and contraction of the wire ropes, by changes of temperature, have been recognized.

A hempen rope will contract in length when wetted, owing to the minute particles of water acting as wedges, increasing the width and the convexity of its spiral curves. The fibres of the same hemp laid straight, will not be shortened by wetting, but when in small fragments, as when made into paper, will be expanded in a similar manner by wetting.

An iron rod and wire rope of equal lengths would expand equally by heat, waiving the above referred to property, but the wires of the rope being in contact, and expanding laterally, would, by an equivalent wedge-like action, increase the convexity of the curves and tend to shorten the rope. By a reverse operation cold contracts and flattens the spiral curves, and tends to lengthen the wire rope, as with the hempen rope, when dried and stretched.—T. W. Bakewell.

**Steam Boiler Incrustations.**

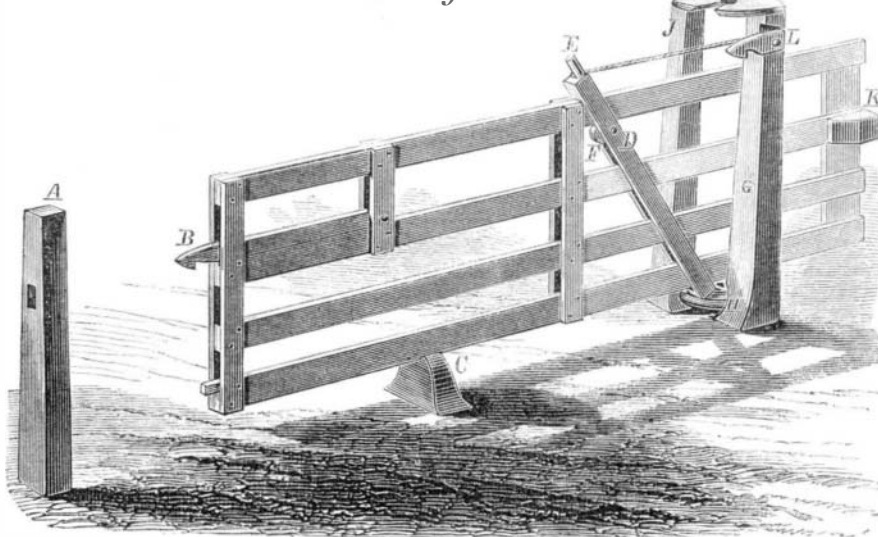
According to the *Chemical News*, M. E. Wiederhold states that the hardest incrustations of this kind are formed when the quantity of carbonate of lime amounts to from 20 to 25 per cent of the entire mass. He has found, by an experience extending over several years, that some kinds of clay, among these the substance known as *kieselschiefer* (a peculiarly fatty clay), when suspended in the water, contained in steam boilers, prevent the particles of carbonate and sulphate of lime dissolved in the water, even if the latter is very hard, to cling together, and become fixed to the sides of the boilers, forming there a hard incrustation. A series of experiments, made on purpose, and continued for a sufficient length of time to yield a reliable result, has fully proved that the addition to the feed-water of the steam boilers of fatty clays, especially the kind known as fuller's earth, entirely prevents boiler incrustations, even where, of necessity, very hard water has to be used as feed water. A loose, soft mud is deposited as soon as the motion of the water, due to the boiling, ceases on cool-

ing. This mud readily runs off on opening the sludge valve of the boiler.

**Increase of Weight During Combustion.**

The *Chemical News* gives a description of an interesting experiment. A small horseshoe magnet is hung up at the beam of a balance sufficiently sensitive to turn with centigrammes; the poles of the magnet are immersed for a moment in the *limatura ferri* of the chemists' shops, and a beard of small particles of iron is caused to adhere to the poles; by means of proper weights placed on the scale-pan at the other end of the beam the equilibrium is restored. This having

Fig. 1



MOXLEY'S FARM GATE.

been done, the finely-divided iron is kindled, by approaching to it the flame of a Bunsen gas burner, and continues to burn. While burning, it will be seen that the arm of the balance on which the magnet is suspended considerably deviates from the horizontal position, thus indicating an increase of weight on the side where the experiment is going on. This experiment succeeds best with a magnet of moderate dimen-

cessed to allow the air to flow freely up around and to enter the interstices of the grate as well at the back as the front. By similar means the air also enters the ends of the grate to supply all parts of the incandescent coal equally with the oxygen necessary to combustion. The air also becomes heated in this chamber previous to entering the fuel, and is thus in the best condition to favor combustion.

The ashes, when the grate is stirred, fall back into the recess instead of pouring forth into the apartment, and thus one of the objections to the use of grates, which has greatly retarded the employment of this most wholesome and pleasant of all the means employed for burning coal in dwellings is removed. The inventor claims that the use of this grate will cure smoky chimneys on account of the more perfect draft secured.

The back is made separate, and can be used with ordinary baskets, in grate fronts of any pattern and with all grates by re-setting. It is simple in construction, and not liable to get out of order. The inventor also states that air-heating compartments are successfully used in connection with it.

State and county rights may be obtained on application to the inventor, who will also furnish full-sized patterns gratis to purchasers.

Patented through the Scientific American Patent Agency, August 25, 1868, by G. H. McElevy, Newcastle, Pa., who may be addressed for further information.

**Lürmann's Blast Furnace.**

*Engineering* states that a considerable number of German ironmasters have, during the last two years, applied to their furnaces the system of Mr. Lürmann, the manager of the Georg-Marien Mining and Iron Company, of Osnabrück, Prussia, the improvement consisting in closing the front of the hearth, thereby dispensing with the dam stone, tump, etc. A scoria outlet is set in the closed breast at a distance of about 6 in. below the tweers, and through this outlet the slag runs off regularly and constantly. The tapping hole is placed where the heat is greatest.

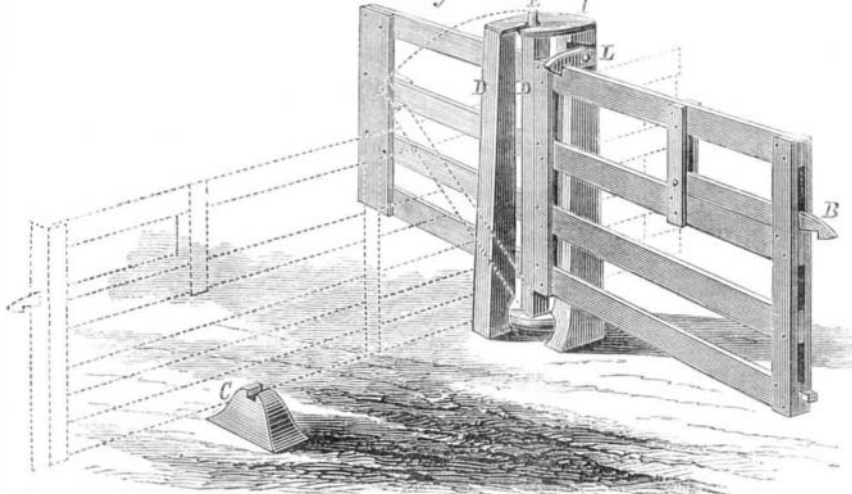
This arrangement has been successfully worked for six months or more at the Old Park Iron Works, Shropshire, and more than one of our leading ironmasters have expressed their intention of adopting it. Its advantages are thus enumerated:

1. The slag discharges itself through the scoria outlet at about the same level, therefore there are no vacillations of the slag in the hearth, and the corroding of the wall is diminished.
2. As there is no fore-hearth, there are of course no repairs, and no breaking up of the scoria crust in the same. This is equal, as shown above, to a saving of at least twenty days per year. Suppose a large furnace produces forty tons per day, the same will yield at least eight hundred tons per year more, if built on Mr. Lürmann's principle than if it were of the ordinary construction.
3. As there are no interruptions, the furnace does not cool. It works more regular, as the heat in the furnace is always the same.
4. The doing away with the dam and the fore-hearth allows the removal of the tapping-hole from the former into the wall of the hearth. The opening of the tapping-hole is then easy, as it is close to the greatest heat.
5. The completely-closed hearth allows a considerable increase of the pressure of the blast, because a throwing out of materials has become impossible.
6. The increase of the pressure is always of great importance, and especially where pit coal, anthracite, etc., are used; and where the layers are compact. The number of charges can be greater, effecting a corresponding increase of produce.
7. The augmentation in the number of tweers, and the equal distribution of them, made feasible by the doing away with the forepart of the hearth, allow a better and equal distribution of the blast in the hearth; the furnace therefore works better, and a greater quantity of ore is smelted, provided there is sufficient blast.
8. The number of hands may be lessened, as the operations are few and easy; the same need not be of great skill and experience. No fire clay and other refractory materials for the repairs, and less tools, are wanted. It may be mentioned that formerly the smelters of Georg-Marien-Hütte, when working, were almost stripped; now they are always in full working dress.

TO CLEAN OILCLOTH.—An oilcloth should never be scrubbed with a brush, but, after being first swept, should be cleaned by washing with a soft flannel and lukewarm or cold water. On no account use soap or water that is hot, as either would have a bad effect on the paint. When the oilcloth is dry, rub it well with a small portion of a mixture of bees' wax, softened with a minute quantity of turpentine, using for this purpose a soft furniture polishing brush. Oilcloth cared for in this way will last twice the time than with ordinary treatment.—*Septimus Piessé.*

WE have received a number of communications on the subject of street crossings, none of which seem to us to contain any practicable suggestions, they are therefore declined with thanks.

Fig. 2



sions; the horseshoe magnet applied in this instance weighed, without its armature, 210 grammes, and can bear a load of 12.5 grammes of iron; when this is altogether converted in magnetic oxide, by combustion, the increase in weight will be about 4.7 grammes.

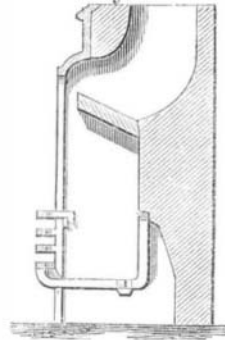
**IMPROVEMENT IN OPEN FIRE GRATES.**

Great as have been the improvements in all kinds of domestic heating apparatus, we all know that a very large proportion of the available heat still eludes us and passes through chimneys to the open air. And there is no doubt

Fig. 1



Fig. 2



also that much of the combustible matter is distilled rather than burned, and passes off as gas, not only failing to give its share of heat but taking with it a portion of the heat furnished by that which is consumed.

Our engravings exhibit a form of grate called by the inventor a Perfect Combustion Grate, calculated to obviate these losses, by securing more perfect combustion, and using to greater advantage the heat produced.

To secure these ends the grate is constructed as shown in front elevation, Fig. 1, and in section, Fig. 2. It will be observed that the mason work at the back of the grate is re-