

more time, he must give it ungrudgingly, if he cares for the safety of his establishment.

It is our invariable practice, on visiting any steam factory, to find out the attendant, and see the gauges tried. On visiting a small establishment of this kind not long ago, we found the boiler surrounded with shavings and chips, and the steam up, and no person apparently in charge; and on trying the cocks, we found pure steam only. Having some little business with the principal, we went up stairs, and found him working away quite deliberately, as if his factory was run with horses and not with steam; no "make haste" in his case; and on mentioning that the boiler required water, he quietly moved down and started the pump, as unconcerned as if he thought it of no consequence. This same person had an explosion some years ago, when the boiler went through several buildings. Such a person is the last who should own or have any control of a steam boiler; nor should he ever be employed about a steam factory.

The mountings of a steam boiler comprise the gauge cocks, safety valve, stop valve, sometimes a surface blow-off valve, pressure gauge, manhole and mudholes. There are also used by some parties who really desire to have everything right, and spare no expense to have them so, several other devices, as water indicators and low water signals, which require some notice here.

Gauge Cocks.

There are several kinds of gauge cocks, and each kind in great variety;—so numerous, indeed, are their petty distinctions, that it would fill a volume to note their claims. All that is wanted in a gauge cock is, that it will be of such construction as not to wear out soon from the using, and to discharge a good stream from the orifice, for the better distinguishing of the discharge of steam and the water therefrom.

There is one very good and durable kind of gauge cock, the prominent feature in which is, that the aperture is opened and closed by two flat discs, one in the body of the gauge cock behind the orifice, the other on the stem with an india rubber packing in the face, secured in a recess turned out to receive it, and moved back and forward by a small wheel on the end of the stem, the stem having a screw cut in it for this purpose. The packing can be renewed as it wears out, and when the discs get ground or cut, they can be readjusted in the lathe.

There should always be several spare gauge cocks, so that the repairs can be done on them at any time suiting the convenience of the brass finisher. It looks bad to see faulty cocks, drop-

ping and blowing where all should be tight and clean.

Water Indicators.

There is no indicator more reliable than the gauge cock. The only advantage of an indicator is by having it correspond with the cocks: unless it does this, it is of no use. The advantage of an indicator is this, that its dial being always looking as it were in the face of the attendant, he cannot but take notice when the pointer is looking downwards, which is in fact telling him to try his gauges; and if he is not at hand to observe this, when it gets a little lower down, it will let not only himself know, but all in the establishment, by blowing a loud and shrill whistle, and which will continue to blow until some one comes to its assistance, and puts matters right. A machine that will do this is of much importance, and renders valuable assistance itself in the management of steam boilers.

Duff's indicator and low-water signal is got up expressly for this purpose, and is every way effective.

Safety Valve.

The safety valve, as previously stated, should be accurately made, and of sufficient size to carry off the steam at a pressure equal to the tested pressure of the boiler, and should be placed on an accessible place, without any obstruction being in the way of getting to it. It is not necessary that the stem of the valve should have a link on the top embracing (loosely) the lever. When the lever is lifted by means of the rope and pulleys, the valve, if free, will be raised by the pressure of the steam; and if it does not rise, it is stuck fast on its seat, and the dampers must be shut down until this is adjusted; and if the steam be getting too high while this is being done—which the pressure gauge will show—the fire must be drawn out.

Pressure Gauge.

The pressure gauge is very useful in such cases as the above, and also for getting up steam. This machine can also be detected when supposed to indicate incorrectly, by moving the counterbalance to the several notches on the lever of the safety valve. When it is right, the graduations on the dial and the notches on the lever will correspond. The pressure gauge has now become a necessary adjunct to the steam boiler.

Blow-Off.

The blow-off valve should be used once in every twelve hours at least, blowing not less than one solid gauge out at one time—having more than three solid gauges when commencing to blow off—