

Mechanics.

IRON VS. STEEL FOR BOILER PLATES.

The question of iron vs. steel for boiler plates continues to be the subject of an animated discussion in England and on the Continent. Both sides of the controversy are being conducted with considerable skill, and some facts of interest are elicited from various sources. It will be remembered that attention was again directed to the subject by the failure of the steel boilers of the "Livadia." After the plates had been passed as excellent in quality by the shipbuilders, by the Russian inspectors and by the officials of Lloyd's, the finished boilers broke down under a test which was by no means severe. It was naturally concluded that there was something radically wrong. The case does not, however, by any means sufficiently justify a wholesale, indiscriminate condemnation of steel as a material for that purpose, nor would it, on the other hand, be wise to pass by such a failure in absolute silence. The present and great prospective value of steel is fully admitted by all who have had occasion to test its merits. We have, however, the testimony of too many intelligent and disinterested constructors as a proof that the new material, "ingot iron" or "mild steel," is subject to sudden and, apparently, unaccountable failures. The interests of producers of steel and of their customers are not well served by any attempt to pass by these failures in silence, and it is certainly a poor argument on the part of the friends of steel to urge that iron is worse. What is wanting is a full and clear statement of facts, so that it may become possible to fix with certainty the dangers to be avoided and settle upon the best treatment to be adopted. Whether and under what circumstances open-hearth or Bessemer steel is permissible or preferable, is also a matter which will come up for early decision. As yet there is—justly—an inclination to adhere to the milder qualities of metal turned out by the open-hearth process, and, as we have had occasion to state the result has been very favourable to it in this country. It has been argued that the favor which steel has been gaining in England is due, to a large extent, to the liberality of the steel-making firms in the matter of credits and the promptness with which they are willing to replace defective plates by new ones. As a business measure, in introducing an unknown material, such a course is evidently a wise and prudent one, but we doubt whether an attempt to keep occasional failures as quiet as possible, by taking back rejected plates, is still the correct one. Boiler-makers have sufficient confidence in the new material, and consumers will not now be frightened off by a free discussion of matters relating to its use. Little can be gained, and much lost, by undue reticence, and we hope that in the next few years the questions relating to the treatment of steel boiler plates will be freely and fully entered into. The failure of the "Livadia" boilers is a case in point. All that can now be said can only be general in character, until specific and detailed facts are forthcoming to form a sound basis for argument.—*The Metal Worker.*

PRACTICAL VIEWS ON HORSE-SHOEING.

Do you value your horse, and wish justice done to his feet by the smith? If you do, assist the smith by paying a little attention to the horse's feet yourself. Any one who has observed the paring of horse's feet is aware of the excessive hardness of some feet. They plainly see a considerable amount of physical exertion used by the smith, and note that the instruments become dull by the hard resisting horn which they have to contend with, causing a loss of time in preparing the hoof for the shoe.

A careful and observing man who has fine horses to take care of, thinks it but little trouble to stuff the feet for the purpose of softening them. This may be done by oiling the sole of the foot, and by saturating loose cotton waste with oil and embedding it against the sole of the foot. Then with a sharp knife cut pieces of stiff whalebone the proper length, and spring them in place between the hoof and shoe for the purpose of keeping the waste in its place. The whalebone is no source of danger in case of accidental removal. This can be done the night before shoeing. When the horse is taken to be shod, the material can be removed. A foot thus prepared will be clean of all hard spots, and easily shaped to suit the smith, while the sole, naturally elastic, will be rendered more so, to the benefit of the sensitive laminae of the inner part of the foot, between the coffin bone and the sole.

Cow manure will answer the same purpose as the oil and waste with little or no trouble, the only preparation required being a

shovelful placed where the horse stands. This will also remove soreness after a severe day's labour, and the moisture from the manure has a tendency to check the heating and drying nature of the straw bedding.

A great number of fine driving horses have very hard feet. Any one who will pay attention to keeping the feet properly softened will observe a marked increase of activity in the horse's movements.

Heavy dray horses in hot weather should have their feet well cleansed of all gathered material, such as loose earth, sand and sticks, which sometimes get between the shoe and the sole of the foot. After being properly cleansed they should be painted with oil. A fifteen cent. brush and a pot of oil, costing twenty-five cents, will last two months. This tends to prevent the heat absorbed from the sun's rays that arises from cobble stones and earth, from drying the feet. The benefit of this little hint, if acted upon, will be found inestimable. The dumb brute who contributes his strength for the benefit of man, at the end of the day should have his limbs washed, his feet cleansed and oiled, clean water to drink, and a generous supply of wholesome food, as well as good clean bedding, so that he may become refreshed for the following day's labour.

CHAS. SMITH.

BLOWERS FOR BOILERS.—A correspondent of the *Boston Journal of Commerce* has been investigating the subject of blowers for steam boilers and gives the following as the result: from my investigations and experience I have arrived at the following conclusions: Upon inquiry of the largest manufacturers, I found that there are more blowers now being used for boilers purposes than ever before, and that there use for that purpose is steadily increasing; that the power required to run a blower for such purpose is small as compared with the benefits obtained in increase boiler capacity and the ability to use a cheaper class of fuel; that there is small risk from fire if properly put up and used. During several years' use of a blower, and from inquiries made of those used for the same purpose, I can learn of no instance of back draught occasioned by its use. (The mill adjoining me using no blower was set on fire by back draught). There will be no blow-pipe action if the air is properly put into the ash pit and regulated by a gate, and the effect on the crown sheets will be the same as with strong natural draught. It is not an uncommon occurrence to be obliged to renew the crown sheets when blowers are not used. Certainly something must be wrong and out of the usual course to be obliged to renew them on new boilers in so short a time. In conclusion, my own experience demonstrates that to offset the disadvantages of a blower, if any, a saving is made of fifty per cent. in fuel expenses by my ability to use a cheaper class of fuel although I have a good natural draught from a 100-foot brick chimney."

A CIVIL engineer writes thus trenchantly in the *London Building News*:—One would imagine, after the perusal of a modern fashionable building specification, that its framer and the concoctor of its details had the most perfect knowledge of the materials on which that document so glibly descants. If, however you take the trouble to follow up the work it pretends to control, you, in the majority of cases, find that the whole thing is a mere sham, not so much from the desire to do wrong as from the incapacity to do right. A clerk of the works is, as a matter of course, appointed, whose duty is supposed to be of a protective character; but even the most experienced of that class is unable to cope with the difficulties with which, even in an ordinary building, he is surrounded. Unfortunately, in these times, both engineer and architect prefer the luxurious office to the building they have undertaken to construct, and have no pride in looking after the details on the ground—unlike, in that respect, Wren and Smeaton, the former of whom, it may be safely affirmed, knew every stone in St. Paul's, and the latter had an equally intimate acquaintanceship with every member in the scheme of his great work—the Eddystone lighthouse."

THE CORROSION OF IRON.—Air alone does not corrode iron. Therefore, by the elimination of aqueous vapor and carbonic acid from the interior of closed iron vessels, the iron is preserved. The principle can be utilized in many ways for preserving unused steam boilers by thoroughly closing all orifices, and by heat causing the aqueous vapor to evaporate. Burslyn proposes a cheap and simple method, by taking advantage of the affinity which calcium chloride has for moisture. He lays a flat, open vessel, containing the calcium chloride in the iron vessel, and the air is soon freed from all moisture. As soon as the calcium chloride is saturated with moisture, it is useless and re-