Practical Hints for the Factory or Mill Superintendent.

There are so many excellent technical publications issued throughout the world that even the most ambitious superintendent could not afford to read them all to get the cream of their articles. We propose in these pages to give some of the most practical hints and suggestions which appear in the technical press in all countries.

One Barrel of Oil Per Year.

By George H. Kellogg in Power.

The remark of an oil agent, that I "ought to be ashamed to look an oil agent in the face," when I told him that I only used one barrel of engine oil per year on a cross-compound Ball engine developing 400 h.p., caused me to think that Power readers may be interested to know how I accomplished the feat.

The engine is practically inclosed and has sight-feed spindles for all bearings, supplied by a pipe-oiling system connected to an elevated tank. All drips, except for the eccentric shields and the idler-arm drip, lead to the crank-case, from which the piping extends under the floor to a filter. This filter is one of my own "get up"; it is not patented as far as I know. After being filtered continuously for from six to eight months, the oil comes out perfectly clear, only slightly darker in color.

I had previously made three filters, of the "oil through hot water" variety, for other plants in which I had been employed, and was intending to make or get one of the same kind when I took charge of this plant. But at lodge meeting one night, I got into an argument with an oil expert regarding the efficiency of filters in general, and the "oil through water" kind in particular. One of his remarks impressed me very much. It was: "Oil manufacturers will water their stock, but they keep the water away from the oil." He also told me that oil exposed to

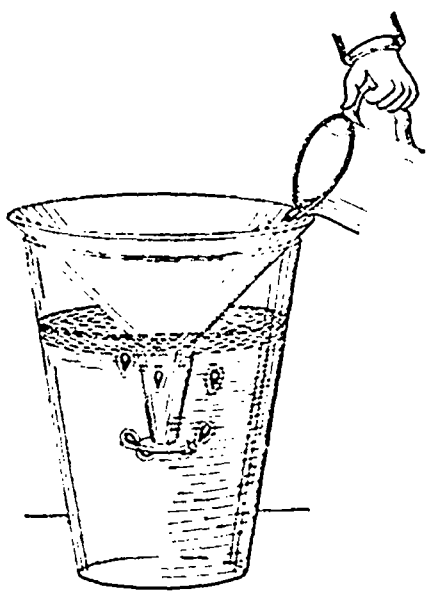

FIG 1

moist atmosphere would absorb from 2 to 3 per cent of moisture; and that the muddy and turbid appearance of oil coming from the ordinary filter was caused by the moisture it contained. By putting the oil up through a filter bed of charcoal, or other absorbing material, the oil would leave the water be-

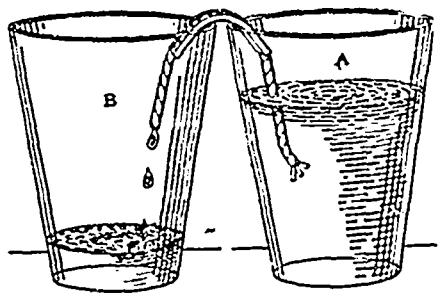

FIG. 2

hind and come out clear again. Oil manufacturers use a filter bed to take the dirt out of oil, but water, no matter how hot, will not take the dirt out.

The next morning I started to experiment. I took a small funnel and soldered a small tin cap to the lower end, to spread the oil out in drops. Then I filled a large tumbler half full of hot water and placed it on the steam chest to keep it hot. I put the funnel in so the tin cap was 2 inches under the water. (Fig. 1) and then put in the dirty oil very slowly. As each drop of oil formed on the upper edge of the cap, to flow through the water, I watched to see it leave some of the dirt behind, but it didn't. After putting through enough to nearly fill the glass, the water was just as clear as when I started. I then put some fine iron filings in the oil, and the film of oil around the filings carried them up through the water, too. That settled me on the "oil through water" proposition.

Then I got another glass and making a tin trough to reach from the inside of one glass over into the other, I put a lamp-wick in the trough (Fig. 2). Then putting the dirty oil in the glass A, I watched results. Soon drops of clean oil formed on the end of the wick in the glass B, and in about four hours I had half a glass of as clean oil as any one ever saw.

Having found a method that produced good results, I worked it out on a large scale. I had a galvanized tank made, 20 inches high by 30 inches diameter, for a clean-oil tank; another of the same diameter and 12 inches high, with the lower rim flanged to set on top of the clean-oil tank, for a filtering chamber; then on top of that another tank 6 inches high, with a flanged rim to set on the filtering chamber with a cover, through which a pipe leads the dirty oil. This is a settling chamber, where the oil separates from most of the water and heavy sediment. See Fig. 3.

From the settling chamber, the oil is fed to the filter chamber by an automatic valve, then through 9 feet of 1-inch wicking. By this means the oil is separated from the rest of its impurities and is carried up over partitions of troughs, draining into the clean-oil tank. This filter will take care of one gallon of oil per hour, and so I use about that much oil, although half that amount would be ample for the engine. The extra oil washes off the bearings and keeps them cool, and I am only wearing and losing about one gallon per week.

I find that I cannot use a cheap paraffin oil, nor an oil of high viscocity, as the wick soon separate the filler or heavy compounding from the mineral stock, leaving a thin oil of poor lubricating quality. I have tried for

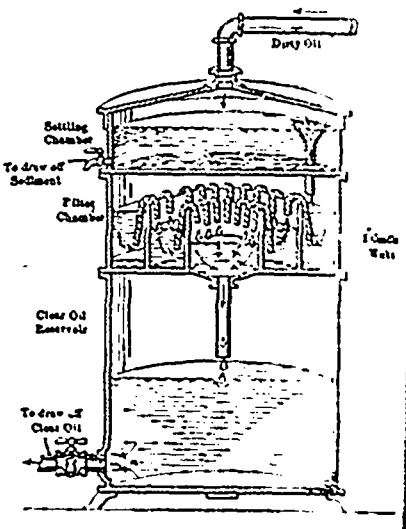

FIG 3

different oils in my system, and always put the oil in on three months' trial; it will run three months, filtering continuously, I will risk it the other nine.

In putting an oil on trial, I put the whole barrel in the system, and after it has run down to about 25 gallons I put in a gallon of fresh oil each week to maintain the level.

Copper Castings.

From Metal Industry

Pure copper cannot be cast in sand with considerable difficulty; in fact some deoxidiser is always used. For commercial castings from two per cent. to [illegible] per cent. zinc is generally added to get sound castings, but for electrical work this is [illegible]. The only way to get good electrical castings is to melt pure electrolytic copper in a plumbago crucible under a thick layer of charcoal. When thoroughly melted add [illegible] per cent. silicon copper and stir it in with a stick and cast as soon as ready. Practice [illegible] alone will show the correct temperature for casting copper in sand moulds. [illegible] the temper of the sand. It must not be [illegible] boiling, but a fairly high temperature is necessary.