BEARINGS AND JOURNALS.

CAST iron makes one of the very best bearing surfaces for a shaft if it is never allowed to lack for oil. But if it gets dry trouble is at hand. When a cast iron bearing gets dry it will do lots of mischief in a brief period of time. When it wants oil it wants it real bad, and it wants it right away; if it does not get it it seizes and tears the journal with great intensity of desire, as it were. This is particularly the case during the first few days of use. After considerable use, well supplied with oil, the surface becomes glazed and is not so likely to do damage from a little neglect in the way of oiling. Still the danger is there, modified in degree only. Cast iron bearings are not so much used as they would be but for this ever present danger.

A well-known steam engine builder and mechanical engineer, when he put his now well-known steam engine on the market, several years ago, knowing the value of cast iron bearings, determined to overcome what he believed to be a prejudice, and used it for main bearings and elsewhere about the engine. He was forced to give it up after a year or so of trial, proper attention not in many cases being given to oiling, with the stereotyped results.

When cast iron is used for a bearing the box should be made so as to cut off not less than ⅛ of an inch from each end in squaring up, as the ends are likely to be chilled a little in the mould, and unless cut off for a little distance in there will be a narrow ring of metal that is harder than the rest of the bearing surface, and the journal will be cut. For a similar reason a liberal allowance should be made for boring.

Generally speaking, the bearing and journal should not be made of the same material, although this may sometimes be unavoidable. Cast iron appears to be about the only exception, a cast iron journal and bearing running together nicely, but for the exception previously mentioned, that is, when there is danger of getting dry.

Cast steel does very well if both journal and bearing are hardened, and the same is true of wrought iron when case-hardened. But in both these instances, the journal and bearing are special, that is, they are not such as are made for ordinary purposes, their cost being too great.

Almost the universal rule at the present time is to use some kind of lining metal, of which babbit metal, made according to the original formula, is an excellent example. Many cheap substitutes for this are made and erroneously called babbitt metal, but their chief merit is usually covered by their quality of being cheap. In this respect cheapness oftens covers a good deal of lead and a little antimony. There are, however, several patented alloys for lining boxes, some of which possess undoubted merit.

Babbitt metal proper consists of two pounds copper, four pounds antimony and forty-eight pounds tin.

A substitute for this which is said to give good results is composed of 11½ pounds copper, 15½ pounds antimony, 47 pounds tin and one pound of yellow brass. These are melted together and two pounds of tin for each pound of the mixture is added.

Neither of the above named alloys is cheap except in the sense that what is good is generally the cheapest in the end.

In lining boxes both the shaft or babbitting mandrel, as the case may be, as well as the boxes, should be made quite warm; this will prevent the lining metal from chilling and blocking up its own passage and will also modify to some extent the inevitable effects of shrinkage.

Sometimes, in the instance of brass shells, the surface is tinned, the lining metal then adhering to the tin and preventing the lining from being shaky when cold.

In crank shaft boxes connecting rod boxes and other first-class machinery, the lining metal is stretched after becoming cold by hammering with a round power hammer, then bound to size.

In more common machinery, a babbitt mandrel a little larger than the shaft is used, and the boxes go just as poured.

When it is necessary to babbitt a shaft in place, in order to compensate for the contraction of the metal, a piece of paper may be wrapped smoothly around it and held in place by a fine thread wound three or four times spirally, or, more properly speaking, vertically, around it. This paper, if of the right thickness, when removed after babbitting will leave a good running fit between the journal and bearing. For a shaft about 2-inches in diameter ordinary letter paper will serve the purpose, while heavier paper can be used for larger shafts.

THE man who takes the trouble to invent little tools and jigs for helping along his work is a valuable man to have, and the right kind of a foreman will encourage him by taking an interest in it, suggesting points or other applications, and in other ways showing him that his efforts are appreciated. All jigs may not be economical and all plans suggested for work may not be useful, but the right kind of a foreman will have his men feel free to discuss these questions before the tools are made, and by so doing save the cost of various experiments.—Machinery.