

**THINGS THAT ARE
USUALLY WRONG**

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Things that are usually wrong by John E. Sweet

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TO MISS
ALBERTA

PREFACE.

The following is in the main a reprint of a series of articles published in the *American Machinist*, and it is thought by the author and publishers that it will be found useful to Mechanical Engineering Students, Machine Designers and Inventors; and should those who buy the book be disappointed they can console themselves with the fact that it did not cost much.

It will not be strange if, among so many statements, some are unjustifiable; but those who hunt them out will profit more by it than those who accept all as fixed facts.

The book is small and it is the hope of the author that the most of the readers will wish there was more of it.

JOHN E. SWEET.

Syracuse, N. Y.,
May 1, 1906.

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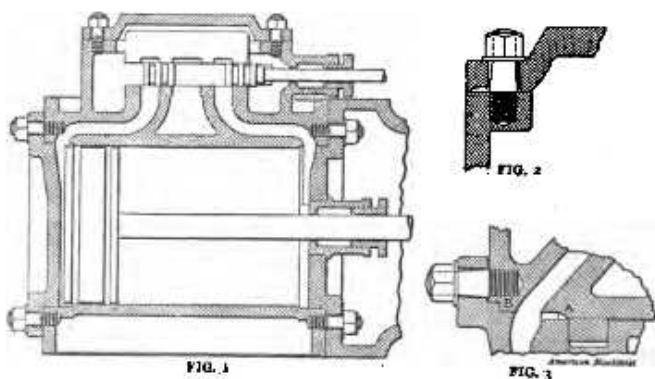
THINGS THAT ARE USUALLY WRONG.

INTRODUCTION

Whoever designs a new machine or an improvement on an old one conceives of some feature or ruling object of his design or some feature that is an improvement on present practice and neglects the other features—simply follows common practice without considering whether the other features may not be as open to improvement as the special feature he is working out. As an example, the designer of a new lathe for high-speed steel or the electric drive invents a new headstock, puts more iron in the bed, sticks under it the old supports, puts on the old tailstock, uses the old slide-rest and the compound rest, without a thought as to whether there are any better ways. The writer knows how this is done because he has done the trick himself over and over again, and the object of these comments on the things that are usually wrong is to stimulate designers to avoid them.

MAKING PLANS FOR A NEW ENGINE.

An old machine company, thinking they would go into the high-speed, high-class, shaft-governed steam-engine business, employed a draftsman or mechanical engineer who had some original idea as to a shaft governor. He followed precedent in all things except the governor, and made his drawing of the cylinder.



He had found that in order to get in his valve motion the valve needed to be a considerable distance from the cylinder, otherwise there was no special requirement, and Fig. 1 shows how he made it. It looks so much like common practice as not to attract particular attention, and yet there are

half a dozen things about it that are far from being as good as they might be or as they ought to be, to be called twentieth century high-class steam-engineering practice.

First, the studs go through into the steam chest, which is all wrong, to avoid which calls for the cylinders being an inch or two longer, and besides, if the best is wanted, the ends of the studs that tap into the cylinder should be one size larger than the outer ends, as in Fig. 2. When a stud of this kind is broken off, it can be removed without drilling out the piece in the casting. It is sure to part outside the cover, as the weakest point is at the bottom of the thread under the nut, rather than at the bottom of the thread where it goes into the casting, and is one size larger.

As the valve is a balanced valve, there is no objection to making it as long as possible, so as to reduce the length of the steam passages as shown in Fig. 5. The steam passages are shortened still more by making them straight, and this reduces clearance and makes them easy to clean.

The counterbore should end as at *A*, Fig. 3, so that the piston may be pushed into the cylinder without the rings having to be held in by some extra device. Some of the