

ACCIDENT PREVENTING DEVICES.

MANY serious accidents occur from motor engines running away when the governor belt slips or slides off its driving pulley. These may be prevented by the duplication of the valve disks, the invention of the writer, and shown in Fig. 1. The ordinary balance governor valve A is provided with two extra disks B B, which do not interfere with the passage of steam to the cylinder

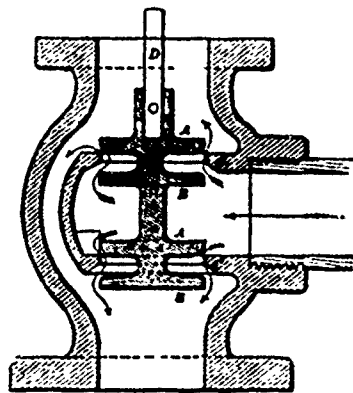


FIG. 1.

when the governor balls are revolving in the proper working plane; but when they fall, by loss of circular motion, the disks B B are drawn into the ways of the steam and effectually stop its flow, whence the engine comes to a standstill.

Loss of life or limb to an operator very often means the loss of a skilled "hand" to an important industry, as well as the loss to a family of its chief means of support.

It may add to the burdens of

public institutions, and may lessen the productive power of our mills. Therefore the prevention of accidents, in a humanitarian sense, as well as in a commercial one, should be a matter of deep interest to us, demanding the exercise of ingenuity in the devising of effective means for securing this end.

The subject is a broad one and this paper proposes to merely touch at a few points, and there leave it to the humanely wise to whom a hint is sufficient.

On the well recognized principle that self-preservation is the first law of nature, the duty of establishing and maintaining protective appliances whenever necessary about dangerous machinery becomes apparent, and the effort to do so is worthy of praise, since we find that nature has well considered this necessity, having organized in our being ample means and methods of giving warning of approaching danger, and of guarding us against injury, which are at once effective and beneficent.

Almost every machine has places about it that will pinch the flesh, mash a finger, or crush a bone, and it will perform these cruel acts upon any one who thrusts his members into its open jaws.

With the exercise of ingenuity and care for protecting the machine against injury to itself, the attendant may be protected also, and if proper safeguards be thrown around a machine, such that, with ordinary care and with instructions that may be given, the attendant can perform all the work necessary about and with the machine with perfect safety to himself, thus preserving machine and man, while the employer, who may be held responsible for accidents occurring from exposed machinery, which might have been protected at little cost, will have performed his whole duty.

A great number of accidents are caused through loss of presence of mind by the eagerness of work people to get through their work expeditiously, under threat of punishment if they do not. The largest contributions to the list of accidents are amputations and maiming of dexter hands, due to this eagerness. If urging must be done, these results of experience call loudly for safeguards and warning mechanism, and the enforcement of stringent rules for safety, which shall be binding alike on employers, on foremen, as well as on the hands themselves.

To prevent accidents happening from belts winding around shafts or couplings of the same, simple and cheap hooks or

belt-rests may be devised for and attached in the needed places. They may be located at C, Fig. 2, to prevent a belt from sliding off the pulley, and others at CC, to hold the belt in safe position when off.

In the belt carriers of Mr. Biedermann, which are formed of a bent, flat, iron bow, C, Figs. 3 and 4, generally concentric with the rim of the pulley and around, say four-fifths of its diameter, and carry four to six hook bolts, which project in a circle a few

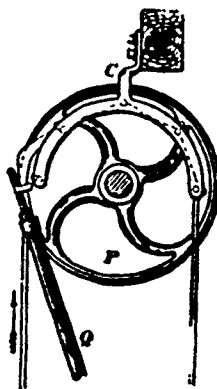


FIG. 3.

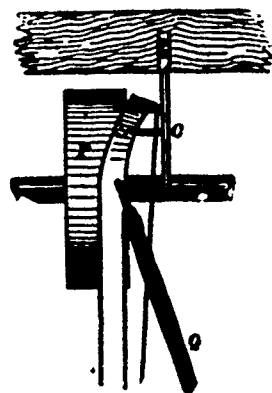


FIG. 4.

inches less than the pulley rim, the first bolt being situated at a point where the belt is taken up, and the last where it is paid out. When the belt is dismounted it is supported by these bolts, retaining a curved position, and is ready to be remounted; it is enough to lift it gently with the long arm Q, surmounted by a curved finger, and bring it in contact with the pulley, when it is immediately carried away on the pulley P without the least exertion.

In the case of a horizontal belt, which is taken up at the top first bolt may be brought as close as possible to the rim of the pulley, the appliance is fitted rather higher, so that the pulley; this bolt being removed from a to a, to allow the long arm to guide the belt and to set it on its real position on the pulley (see Fig. 5). F is a light fork of hard wood, which pre-

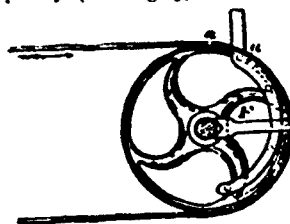


FIG. 5.



FIG. 6.

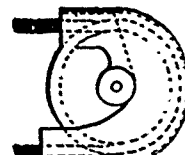


FIG. 7.

vents the appliance from being bent against the shaft when the belt happens to repose upon it. This fork does not touch the shaft when the belt is on the pulley. When the belt is horizontal, and taken up from underneath, the same kind of appliance is used, but in a reverse manner. Oblique belts, whose angle does not exceed 45° , may retain the appliance in its concentric form, but when it exceeds 45° the form adopted for horizontal belts should be used. Workmen frequently indulge in the bad habit of taking both ends of a belt (which is off the pulley and resting on a running shaft) in one hand, and of pressing them together, in which case a fold is apt to be formed on the slack part, which is liable to be drawn in under the tight part, and the whole be rolled up rapidly on itself on the shaft, with

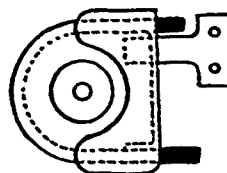


FIG. 8.



FIG. 9.

risk of accident to anyone who may get caught in its drawing up folds.

Many accidents occur from ropes and chains running off their sheaves; an idea is given in Figs. 6, 7, 8 and 9 of guards applied to such sheaves. These may be modified in a multitude of ways, according to the purpose to be served, whether as a protection to the hand, where the rope must be taken hold of, or as a safety device to the machine itself, for hoists, cranes, and the like, where dislodged ropes would wreck the machine.

To prevent rolling wheels from running over any obstruction