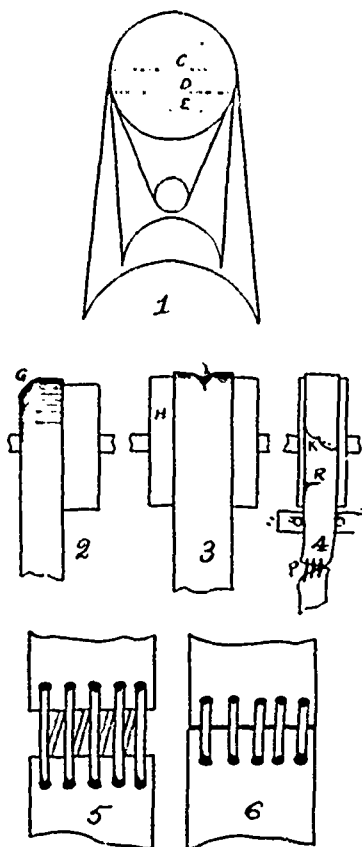


# ENGINEERING and MECHANICS

## LUBRICATION OF LEATHER BELTS.

THE consumption of oils and greases for the lubrication of leather belts is much larger than many suppose. There are, of course, a number of special belting compounds which are used for the dressing of leather belts; but most of the manufacturing plants and power consumers adhere to the old way of caring for the belts, which consists in cleaning them at intervals with grease and oil, tallow or the like, then allowing the belts to stand until the lubricants have been absorbed. Belts which are run in dye houses, bleacheries, steam laundries and places where the air is moist do not get dry enough to require lubrication. But belting in wood working, metal working, shoe manufacturing, flour and similar establishments is more or less subjected to the dry, dust-laden atmosphere of the rooms, and in time becomes harsh, dry and stiff.

A little oil, grease or similar substance may be used to advantage in restoring the pliability of the leather. The trouble is that some men use too much of the lubricant. If the oil or grease is flowed all over belt and is not given time to impregnate the fibre, the belt will lose its grip on the pulley, and quickly run off. If,



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however, the softening stuffs are uniformly and lightly applied and given time to saturate the leather, the fiber will gradually assume a softer and more pliable condition, which will improve the driving qualities of the belt and avoid slipping.

But it is not always lack of a lubricant that causes a belt to slip and run to one side. If a belt is so arranged as to take in but a portion of the pulley, like C, Fig. 1, then much of the arc of contact is lost and the belt will slip with a load, even if the leather is properly lubricated. If the arc of contact is increased to that of D, a fuller grip is obtained of the contacting surfaces, and the belt will not be so likely to slip if it is properly limbered up with the right lubricants. If the arc of contact is brought to F, the bite is still more increased, and the danger of slipping averted, other conditions being right.

The most effectively lubricated leather belts will run to one side if the wheels are incorrectly set. This is illustrated in Fig. 2, in which a sample is given for the condition in which the writer finds very many pulleys. For some reason the local machinists

are quick to decide that the belt itself, the lubricant, or anything but the pulley itself, is wrong. The tendency for a belt is to run to the high side of a pulley, except in case where the belt pulls down on the pulley, as in Fig. 2, when the belt rides the lowest edge at G. There is but one remedy, and that is to line up the shafting on which the pulley runs. Then the belt will take the centre of the wheel.

In Fig. 3 is a common case. A tight and loose pulley run together, and the belt shifter is adjusted so that but a fraction of the belt runs on the tight pulley. The result is that the belt constantly slips. Lubrication will not help it. Procure a monkey wrench and set over the belt shifter so that the full width of the belt will run on the tight pulley, and the difficulty will be overcome. Or if the tight and loose pulleys are set so as to permit a space to exist between, the belt will sink down as at I, and, of course, produce slippage.

If the tendency is for the belt to take a side of the wheel, Fig. 4, out of line with the guide pins J of the shifter, much trouble will result. The strain coming on that side of the belt, the edge will be broken as at R and K, and probably the joint opened as at P. The remedy again is to level up the shaft and pulley.

Again, it may happen that a correctly adjusted belt and freely lubricated one slips at certain points. Then examine the splices. If the jointing of the belt is open, like that in Fig. 5, it may be seen that the slipping occurs here when the lace leather is riding the wheels. The only remedy is to draw up the lacings and close the butts of the belt, as in Fig. 6.—American Miller.

## QUESTIONS ON STEAM ENGINE OPERATION.

A writer in Modern Machinery asks the following questions:

1. How shall I proceed in order to equalize the load on the two pistons of my compound engine, 16 and 30 inches in diameter respectively? At present the high pressure piston does much more work than the low pressure and I wish to remedy the evil.
2. What is meant by re-evaporation in the cylinder of a steam engine?
3. Is it a source of gain or loss in economy?
4. How can it be prevented?

The answers given are as follows: 1. If you have an adjustable cut-off on your low pressure valve gear, shorten up the point of cut-off. This will increase the back pressure on the high-pressure piston, and raise the initial pressure on the low pressure, thus giving more expansion and a better distribution of the steam. If you have no cut-off on the low pressure valve-gear, or if it is not adjustable and you cannot have it made so, lower your boiler pressure and carefully note the effect. This will raise the terminal pressure in the high pressure cylinder, and send more steam to the low pressure. 2. There is always more or less water in the cylinder when running, either from a boiler that furnishes wet steam, from a steam pipe that is not well protected, or on account of initial condensation. After the cut-off has taken place the pressure falls rapidly, and if it is very low near the end of the stroke it so reduces the boiling point that the heat in the walls of the cylinder causes it to evaporate into steam again, but too late to be of any service? 3. It is a source of loss, because it takes heat from the cylinder without producing steam in time to be of value. The result is that when another charge is admitted, some of it is condensed, and this loss frequently is heavy, although often unsuspected by engineers. 4. Measures should be taken to furnish the cylinder with dry steam, it should be well lagged to prevent condensation, and as the pressure cannot fall too low unless the load is light and the cut-off short accordingly, the boiler pressure should be reduced until the terminal pressure is raised. If this is not practical on account of the necessity of maintaining a high pressure for other purposes, a reducing valve may be placed in the steam pipe. These changes will also increase the economy by reducing the loss from other sources.

The District Assembly No. 18, Knights of Labor, Montreal, at a recent meeting, discussed the advisability of petitioning the government to appoint experts to examine electrical plants, it being claimed that accidents resulting in loss of life and limb had taken place through the neglect of the government in not appointing an inspector for this purpose.