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LEATHER BELTING.

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The following interesting paper prepared on the above subject was read at a recent meeting of the Stationary Engineers Association of Toronto, by Mr. C. F. Kinsey, of this city :—

There are two kinds of leather belts, known as oak belting and hemlock belting respectively. The difference between the two is, that the oak belting is tanned with oak bark, or an essence of oak bark, and the hemlock with hemlock bark, or an essence of hemlock bark. Those engineers who are not acquainted with the two sorts on seeing them together would probably notice that one belt was lighter colored and much smoother in appearance than the other. The light colored one is the oak belt, and the dark red one the hemlock belt. The difference in the color is easily detected if they are both properly made.

It sometimes happens that on an oak belt you will perceive dark stains or black places. This tells its own story, viz., that in the dark places the belt was not scoured properly, or, as it is called in a belt shop, the bloom or essence of the oak tan was not raised. The same thing is sometimes seen in a hemlock belt, but owing to its reddish color it does not show so much as on an oak belt. Whether or not these dark stains are a detriment to the wear of the belt I am not prepared to say ; it is certain, however, that they alter the market value considerably.

Now as to the wearing qualities of the two belts. If I was asked which I thought was the best of the two I would most decidedly vote for the oak belt, because it has far more workmanship put into it than the other one. Another reason is that the oak belt is firmer and finer than the hemlock belt. Hemlock belts as a rule (so far as my knowledge goes) are generally a little soft to the touch, and I think if they are put to extraordinarily hard work, a few years will wear them out. As I never had a new belt of either sort to work throughout its natural life, I could not say which will last the longest. I do know, however, that an oak belt costs far more than a hemlock belt, and am inclined to think that if two articles of a kind show such a difference in price, one must have earned a better reputation than the other, and the only way for a belt to earn a reputation is by doing a certain kind of work for a long term of years.

It is just possible that some engineer may wonder if his belt is made of good material. A very simple way to test it, is taken from Roper's book ; cut a slice off the belt about $\frac{1}{16}$th of an inch thick and half an inch long ; put it in vinegar ; if it is well made, it will stay leather for months ; if it is poor leather, the fibres of the leather will swell and it will become like a piece of glue. I have tried this method myself, and found it correct.

I propose now to give you an idea how to get a belt and how to keep it in working order. The points to be borne in mind when calculating for belting are : power to be transmitted ; speed per minute ; distance from centre to centre ; and whether the belt runs in a horizontal, inclined, or vertical position ; the diameters of the pulleys used ; width and thickness of belts, and the material of which the belt is composed ; whether the belt is open or crossed ; its tension, and the area of its contact ; also the general conditions under which the belt has to work. A belt for driving high speeded machinery should combine, as far as possible, uniformity in thickness and width, pliability and smoothness, closeness and adhesiveness of grain made from the backs of carefully selected hides, and be well stretched before using, even joints of sufficient width to transmit the required power without straining the band joint. Wide belts drive better than narrow ones ; a loss of power is largely increased through curling up at the edges. New belts do not bed themselves so well on the pulleys as when they are older. Belts should never be allowed to get greasy or glazed over, as their driving power is thus lessened. In calculating the transmission of power by means of belts, a considerable margin must be allowed for slipping. If it is neccessary to run at short centres and the slipping is excessive, the pulleys should be covered with brown paper. Never use resin to make the belt grip, as it acts injuriously on the leather. For transmitting power for high speeded wood-working machinery, the belts, owing to their becoming hard and dry, should be made about one-fourth wider than is found necessary in other kinds of machines running at slow speeds. As I have said before, it is also very necessary that the belts should be uniform in thickness, with nice even joints to avoid jumping on the pulleys. Twisted belts should be avoided as much as possible. A double belt should never be run over a pulley less than 24 inches in diameter as they very soon crack and are then ruined.

The best way to put a belt on pulleys is to put the smooth or hair side to the faces of the pulleys. One reason for this is, that belts have a better grip on pulleys, owing to the two smooth sides coming together and so excluding the air, and I believe myself that a partial vacuum is formed underneath the belt and the atmospheric pressure makes it grip the pulley all