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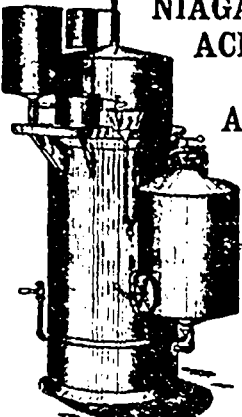
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One says it was only shrewd business enterprise, but that is inadequate as an explanation, because business enterprise could not make possible what was impossible under existing conditions. Therefore, the conditions must have been changed. Between commercial shafting one inch to three inches in diameter, there are thirty-eight different diameters, hence for a full stock the dealer would have required thirty-eight pulleys, one of each size, to match any shaft on which a customer might wish to put a pulley. Pulleys which it would have been necessary to carry in stock, at that time, may be said to vary from ten inches to forty-eight inches in diameter, varying by two inches, and from four inches to twenty-four in width of face, varying by $\frac{1}{2}$ inch. So then, 20 diameters to be carried 38×20 equals 760; 41 graduations in width of face 760×41 equals 31,160 pulleys from which the dealer could fill an order for one pulley, within the limits specified. No dealer would wish to confine his ability to fill orders for one pulley, out of 31,160. Hence that number would be multiplied. Nobody ever thought of carrying such a stock. But the Dodge Company showed how, from a stock of 820 pulleys, less than 3 per cent. of 31,160, any order can be filled within the limits named. That is what nobody has before thought how to do. They did it, and revolutionized the pulley business throughout the world. How did they do it? They did it by adding to the pulley another member, to-wit, and interchangeable centre, whereby any pulley can be immediately fitted to a shaft of any size. No pulley had ever before that been provided with a removable centre, intermediate the pulley and shaft, as a part of its structure and original intention. That was the new idea and invention that made it possible to make pulleys as articles of merchandise which could be kept in stock ready for immediate delivery and use. Of course the inventors did not stop with that. They also sought the best structural design and from the beginning put the best material, workmanship and structural design in their pulleys, so that from the time when they had convinced the skeptical consumers that a wooden pulley would do work and not collapse, their pulleys have been received everywhere as the standard of excellence.

Believing that our readers will be interested in a description of the manner of their construction, we publish the following detailed account.

A wooden pulley should be like the Deacon's One Horse Shey, -equally strong at all points, and it would be difficult to point to any part and say this is less important than any other. Nevertheless there is one point,

which needs to be guarded more than any other, and which in all pulleys except the Dodge, is left without extra safeguard. That point is the point at the junction of the arms and the rim. The importance of this point will be evident when it is considered that a pulley quite commonly makes 300 revolutions per minute and frequently twice or more times that number, and that direction of the belt strain on the ends of the arms is reversed twice each revolution. There is no human structure or known material which will not yield to pressure, and the arms of a pulley, however it may be made or of what material, will spring a little under the pull of the belt, and this alternate pull of the belt, first one side and then the other, and alternating from three hundred to six hundred times per minute, will sooner or later have an effect to grind out any joint in which there is the minutest movement, and this deterioration will be hastened or retarded by the conditions of speed and actual belt pull. Try to move the hand backward and forward three hundred times per minute and some realization of the violence of that movement will be obtained.

It has been found that two pieces of wood united with the best glue, properly prepared, will be stronger in the joints than in the wood itself. This has been proved thousands of times in the Dodge factory, by breaking apart pieces of pulley rims, glued as the parts of the pulley are uniformly glued in that shop. Not once in ten thousand times does the separation occur in the space between the block, but the wood gives way on one side or the other of the glued joint. This statement has to bear on two points in the structure of the pulley. The rim is made with glue and without nails, and the joint between the arms and rim is made solid with glue and a wedge driven in by the side of the tenon to insure that solid contact of the glued surfaces which is essential to a properly glued joint. These points will be referred to again more in detail.

THE RIM.

The rim is composed of layers of wood suitably matched at the ends of the segments and secured together by glue. No nails are used in the rim or about the pulley, because the glue joint alone, properly made, secures all the strength there is in the wood, and nails actually weaken the wood without imparting additional strength elsewhere. The effect of changes of temperature and moisture on nailed structures may be seen on the weather boarding of any wooden house, which has been standing exposed to the sun a few years. The nails will appear partly drawn out, and this is a matter of common observation. Nails are a source of weakness,

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