

crease the belt velocity by using large pulleys, as large pulleys mean a proportionally heavy shaft to carry them, which not only increases the first cost of equipment but also the daily cost of running. In the transmission of the power from the engine to the machines operated a large percentage of the power is lost in overcoming friction and by slippage of the belts.

The larger the diameter of the shaft the greater its weight, unless hollow, and the greater the surface that comes in contact with the bearings, and consequently a greater amount of friction will be created which will require power to overcome. The shafting is subjected to a torsional strain, due to the effort of the belts on the pulleys, and a transverse strain, due to the weight of shaft and pulleys and pull of the belt. The transverse strain has a tendency to bend the shaft, which must have enough weight to resist this tendency. In order that the power consumed in overcoming the frictional resistance of heavy shafting may be used to produce useful work, the shaft should be no heavier than is necessary to enable it to resist the strains to which it is subjected. Some manufacturers hang their shafting in lines the length of the room, which, in long rooms, requires a comparatively heavy shafting to resist the strain. Others use a light-weight shafting and run it in short length, thereby getting rid of loss of power in overcoming the friction of heavy shafting.

The journal bearings in the hangers support the weight of the shaft and is the place where the frictional resistance to the rotation of the shaft is generated by the surface of the shaft grinding on the surface of the bearings. This friction may be so increased by negligence that all the benefits derived by the use of light-weight shafting are lost.

The length of the journal bearing depends on the speed of the shaft and the pressure the shaft exerts on the bearings. With long bearings the pressure is distributed over a larger surface and there is less danger of the bearings becoming heated. When shafts are run in short length the pressure per square inch of bearing surface is less than when the same amount of work is done by shafting hung in a long, continuous line. A pressure of ten pounds to the square inch of bearing surface will not heat the bearing, but hot bearings frequently occur when the pressure is less than this amount. When the bearings are too tight an unnecessary amount of friction is created, which requires power to overcome. Neglect to oil the bearings at regular intervals also creates friction. Babbitt metal, brass bushings, roller bearings and ball bearings will not make up for neglect of this important function, although they do minimize the evil resulting.—The American Wool and Cotton Reporter.

THE WORLD'S WOOL PRODUCTION.

The following figures, regarding the world's wool production in 1903, are published by the National Association of Wool Manufacturers in the United States:

	Pounds.
North America:—	
United States	287,450,000
British Provinces	12,000,000
Mexico	5,000,000
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	304,450,000
Central America	5,000,000
South America:—	

Argentina	370,000,000
Brazil	1,500,000
Chili	7,500,000
Uruguay	96,000,000
Venezuela	15,000,000
All others	20,000,000

510,000,000

Europe:—

Great Britain	134,000,000
France	103,610,000
Spain	102,600,000
Portugal	13,410,000
Germany	49,590,000
Italy	21,451,000
Austria-Hungary	64,300,000
Sweden and Norway	8,200,000
Russia, including Poland	361,100,000
Turkey and Balkan Peninsula	67,500,000
All others	14,000,000

939,761,000

Asia:—

Russia	60,000,000
Central Asia	46,000,000
British India	85,000,000
Asiatic Turkey	33,000,000
China	35,000,000
All others	15,000,000

274,000,000

Africa:—

Algeria and Tunis	30,425,000
Cape Colony, etc.	100,000,000
Egypt	3,000,000
All others	1,000,000

134,425,000

Australasia	500,000,000
Oceania	50,000

Grand total 2,667,686,000

WORK-A-DAY THOUGHTS.

"Sir, I am a true laborer; I earn that I get; get that I wear; owe no man hate; envy no man's happiness; glad of other men's good; content with my harm."—Shakespeare—"As You Like It." (Corin., Act iii., Sc. 2.)

"We are but toilers—in whate'er estate,
Weaving our various fabrics well or ill.
Some are, who ply with happy-handed skill
The deft, swift shuttle, and who ne'er abate,
Th' appointed task, but to strive to emulate
Some fair design, which the controlling Will
Hath given them forth to pattern and fulfil.
But there are others, who, disconsolate,
Their textures weave with foolish fears and sighs—
Like thriftless, thankless craftsmen, who deride
Their labor, with its love dissatisfied—
While to and fro Time's subtle shuttle flies.
O men, O toilers, let us blithesome be,
And weave brave garments for Eternity!"