

lever must be kept level, and to do this we place at a known distance from the center of the shaft a support resting on delicate scales. This support serves to keep the apparatus from overturning, and by the scales gives the moment of the friction. From the scale reading by a simple equation the co-efficient of friction of the oil, or its value as a lubricant, can be computed.

Another way that may be followed is to supply the bearing with constant lubrication by pressing against the shaft directly under the standard bearing, a quantity of waste kept saturated with oil by partial immersion in an oil cavity. A suitable arrangement may be run out of lining-metal, or be made of a wooden block hollowed to fit the shaft. This apparatus gives reliable results. Oils varying in price and true worth by only a cent per gallon, may be selected every time with accuracy. In the present state of unreliability of oils some such means of testing is indispensable. —By F. B. FLINT in the *Mechanical News*.

POPULATION OF BRITISH CITIES.

The populations of some of the principal English towns, 1881 and 1891, are given below. The rates of increase between the two periods in the several towns are also given. It will be noticed that in Liverpool only is there a decrease since 1881:

	1881.	1891.	Increase per cent.
London.....	3,815,544	4,211,056	10.4
Liverpool.....	552,508	518,000	*6.2
Manchester.....	462,303	505,300	9.3
Birmingham.....	400,774	426,200	7.1
Leeds.....	309,119	367,500	18.9
Sheffield.....	284,508	324,200	14.0
Bristol.....	206,874	221,700	7.2
Bradford.....	194,495	216,300	11.2
Nottingham.....	186,575	212,000	13.6
Salford.....	176,235	198,800	12.4
Newcastle.....	145,359	186,300	28.2
Hull.....	165,690	183,800	10.9
Portsmouth.....	127,989	159,200	24.4
Leicester.....	122,376	242,100	16.1
Oldham.....	111,343	131,500	18.1
Sunderland.....	116,542	130,000	12.3
Cardiff.....	82,761	128,900	55.7
Blackburn.....	104,014	120,100	15.4
Brighton.....	107,546	115,400	7.3
Bolton.....	105,414	115,000	9.1
Preston.....	96,537	107,600	11.4
Norwich.....	87,842	100,900	14.9
Birkenhead.....	84,006	99,200	18.1
Huddersfield.....	86,502	95,400	10.3
Derby.....	81,168	94,100	16.0
Plymouth.....	73,794	84,200	14.1
Halifax.....	73,630	82,900	12.5
Wolverhampton.....	75,766	82,600	9.0

*Decrease.

YET ROOM FOR INVENTIONS.

Of all the sack-tying devices, none has proved of practical utility to the extent, at least, of supplanting the old fashioned way of tying with a string. A good sack tie would take wonderfully.

The man who invents a slow-moving feeding device for roller mills that will feed any sort of material, coarse or fine, heavy or light, will have a fortune. Of course it is claimed that there are several on the mar-

ket, but there are not. Saying nothing disparaging of the many excellent machines for the purpose, they either do not do the work on soft stuff or else they run so fast that they are defective as to long life in good condition. The inventor that can get up a slow-moving, perfect feed-regulating machine will have a fortune.

In building a mill it is the case too often that not enough attention is given to the height according to the breadth. This is sure to result in too many elevations and too many choking spouts. All of which means a hard mill to run, a mill that reduces stock, improperly, by elevator and conveyor friction, and a fuel consumer to no advantageous purpose.—*The St. Louis Miller*.

PATENT RIGHTS AND WRONG.

The London *Journal of Gas Lighting*, in a recent issue, gives a review of the present patent systems, from which we abstract the following:

The British trick of grumbling at everything, and incessantly tinkering away at every established system with a view to keeping it up to popular requirements, is apparently as foreign to the American as it certainly is to the French spirit. The condition of the great American patent system is an example in point. Those who praise it in the extravagant way sometimes heard know nothing about its practical operation. As a matter of fact, it is extravagantly costly to the country, if not to the patentees, and but that any excusable outlet for revenue is desired by the Federal government, the working of the Patent Office would be speedily overhauled. The system of prior examination, of which apologists make so much, is utterly useless, since no guarantee is attached to it, and it only causes vexatious delay in obtaining protection, besides being very expensive. Then the absence of any machinery for removing merely obstructive patents has been already remarked.

The British patent system is anything but perfect, but then nobody pretends that it is. The American system is full of defects, and it is considered treasonable to hint at the existence of a single blot upon it.

We in England have not yet been persuaded by Sir Frederick Bramwell, and by those who think with him in this matter, that patented inventions are absolutely unmixed blessings, and that to invent something patentable is the first duty of man. Indeed, the day of cheap patents in which we now live has brought into prominence certain aspects of patented inventions which are not altogether pleasing to individuals or wholly subservient to the best interests of the community.

The facility with which patents can now be obtained is fostering a novel description of public nuisance—the patentee of “unconsidered trifles,” several illustrations of whose vagaries have been recently brought to our notice.

A business firm will patent a variety of construction which other people would regard as a trifle or as common property.

There is yet a hazy impression upon the public mind—the remainder from an earlier state of things—that a patent article must somehow be better than one which cannot be so described. This superstition