

by the Henderson process, iron in England can be made equal in purity to the best Swedish, and substituted for the Swedish in making the highest classes of steel.

FRICITION OF JOURNALS.

A correspondent writing from Columbus, Ohio, asks whether the friction of a large journal is greater than that of a small one, the length and character of bearing being the same in both cases, and the number of revolutions the same, the only difference being in the diameter of the journal.

The friction on any surface, whether plane or cylindrical, is proportional to the weight resting upon it and is not at all affected by the area of the rubbing surface, provided the pressure is not so great, on the one hand, as to change the character of those surfaces, nor so light, on the other hand, as to make the resistance principally that of viscosity of the lubricant rather than that of true friction. In the former case, the friction may increase immensely in consequence of the cutting of the surfaces; and, in the latter, the increase of frictional resistance will be approximately proportional to the increase of area.

The work done in any given time, that is, the power wasted in turning any journal on its bearings, is, where the frictional resistance is the same, proportional to the speed of the rubbing surfaces, since it is measured by the product of the resistance into the distance through which that resistance is overcome. Therefore, it follows that a very large journal absorbs a larger proportion of the driving power of a machine than does one of small diameter, and in designing machinery we should make journals of as small diameter as possible without danger of breaking the shaft, or of causing abrasion of the rubbing surfaces.

Again, the tendency of a journal to heat is the greater the greater the pressure per square inch of longitudinal section of the journal, and it is increased by increasing the speed of the rubbing surfaces. Therefore, to make journals safe against heating, make them of as small diameter as safety permits; and having thus reduced their absorption of power to the lowest limit, secure bearing surface by giving them ample length. If they are, however, made so long that the shaft can spring in the journal, heating may occur from that cause; in line shafting, this will, of course, not happen. The best practice gives line shafting for mills a length of journal equal to four times the diameter of the shaft.

There are rules, known to engineers, for properly designing journals, which are based on the principles above stated. The earliest of which we have knowledge is that of Professor R. H. Thurston, which was based upon observation of the action of crank shafts of naval steamers in 1862. A somewhat similar rule, based on locomotive practice, was published by Professor W. J. M. Rankine in 1865. The first is expressed as follows:

$$l = \frac{PV}{6000d}; \text{ and } \frac{l}{d} = \frac{PV}{44800} = p. \text{ The second is, } \frac{44500}{V \text{ plus } 20} = p;$$

and, when reduced to the same form as that of Professor Thurston, becomes $l = \frac{PV \text{ plus } 20}{44800}$.

Here l = length of journal in inches; P = total pressure on journal; p = pressure per square inch of longitudinal section; V = velocity of rubbing, in feet per minute; d = diameter of journal in inches.

In no case in general practice should the pressure, on even the slowest moving journals, be allowed to exceed 1,000 pounds per square inch of longitudinal section with steel journals or about 600 on iron, running in well worn boxes in each case.

Special care should always be taken to provide for effective lubrication.

PATENT BUSINESS IN CONGRESS.

The Congressional bureau for patent business is now in full blast, and the reports of a single day's proceedings, connected with such matters, occupies an entire page of one of our largest newspapers. It appears from these proceedings that every man who has been dilatory in applying to the Commissioner for an extension of his patent, as the law requires, may readily get a special law passed for his relief by applying to the Committee on Patents of the House of Representatives. Mr. Meyers, from that Committee, stated the other day to the House that in all such cases the Committee unanimously recommended that the petitioner should be relieved, and that Congress had never refused relief. Such being the feeling of Congress, it seems to us that members might save themselves the loss of much valuable time by passing a general law authorizing the Commissioner to hear dilatory petitions.

In the following cases, wherein the parties failed to put in their petitions for extensions within the time specified by law, Congress has, by special enactment in each case, authorized the Commissioner to hear and decide as to the propriety of extensions, namely:

Patent of Joseph Fox, for an Improvement in machinery for making Crackers. Patented February 1, 1859.

Patented by Thomas Warker, for an Improvement in apparatus for Generating Acid Gas. Patented April 27, 1858.

Patent of James C. Cooke, for an Improvement in Manufacturing Webbing. Patented January 4, 1858.

Patent of Nicholas G. Norcross, for an Improvement in Planing Machines. Patented June 22, 1852. In this case it was shown that the patentee was deceased and that his son, Frederick W. Norcross, who now applies for the extension, was, at the time of the expiration, in the service of his country as a lieutenant and had distinguished himself for gallantry and bravery. In consequence of his occupation in the service he was unable to apply for the extension within the time required by the law, and now comes before Congress,

asking that the Commissioner of Patents may be authorized to hear and act upon his petition, the same as though there had been no legal lapse.

The bills for the extension of the following important patent monopolies were then discussed:

WOODBURY'S HORSE POWER PATENT.

Application of Daniel Woodbury for a revival of his Horse Power Patent. Originally granted in 1846. Expired in 1860, at which time the applicant made strenuous efforts to get the patent extended by the Commissioner of Patents, who, for good and sufficient reasons, refused an extension. Three years ago Woodbury applied to Congress for an extension, but the bill failed to pass. He now appears again, his patent having rested among the dead for twelve years. The Committee made a long report on the subject adverse to the revival of the monopoly, and so the patent sleeps.

MARCHER'S COMPOSITION PATENT.

Rebecca A. Marcher. Being an application for a second extension of the patent of her late husband, Robert Marcher, originally granted October, 1851, for a machine for applying semi-liquid composition to picture frames, producing ornamental work thereon, etc. Extended seven years by the Commissioner of Patents, which extension expires October 21, 1872. This is an important patent and is in very extensive use. The Committee, in consideration of the fact that the petitioner was a widow in indigent circumstances, with three minor children to provide for, recommended a further extension for seven years from October 21, 1872, and the bill was passed.

THE HAYDEN BRASS KETTLE PATENT.

The great Hayden Brass Kettle case was then considered. This was the patent granted to Hiram W. Hayden, December 16, 1851, for machinery for making kettles and analogous articles. Extended for seven years by the Commissioner of Patents, which extension expired December 16, 1872. The patentee asks Congress to give him another extension of seven years.

It was shown that this patent formed one of the largest patent monopolies ever granted. For the last twenty years it has been held by the Waterbury Brass Company, who are understood to have grown immensely wealthy from the profits on the patent. The patent covers, broadly, the right to make kettles and other articles by what is known as the spinning process. It was shown that the Waterbury Company had driven out of market all other kinds of kettles and possessed the exclusive monopoly of the business.

It was shown in behalf of the inventor that, even if his assignees had grown wealthy, that he himself had not received any adequate remuneration; but he probably would be able to compensate himself if the further extension now asked were granted.

Mr. Kellogg, speaking in behalf of the applicant, made the following interesting remarks:

"This is an invention which completely revolutionized the manufacture of brass kettles; it created a new art. Instead of being an invention to be sneered at as worth but little, it is one of the most wonderful inventions ever made in the process of working metals. It consists in what is called spinning metal. A flat disk of brass is taken, and by means of machinery the metal is spun, so that the particles are changed, while still maintaining their adherence and force. Before this invention, kettles were pounded or battered or stamped by hand—a process so laborious that no man even in those days could work at this occupation more than eight hours a day; and even then the kettles were so made that they would be thinnest at the bottom and the edges, where the fire came; so that two kettles made in this way would not last any longer than one made by this new process by spinning. By this process of spinning metal this inventor, Mr. Hayden, produced kettles of double thickness at the places where the fire comes; and according to all the evidence before the committee, one of these kettles will outlast two of the old kind. In proof of this I may mention that, when this invention had come into use, kettles manufactured by the old process were driven entirely out of the market. The evidence also shows that at least a million and a half of dollars have been saved by this invention on the single article of kettles.

"This article of manufacture is comparatively less used in this country than formerly. This inventor not only introduced a new art, but he opened up a new branch of commerce with some of the European nations and Africa. A great part of the kettles manufactured under his invention have been exported. Thus this invention is helping every day to keep the balance of trade in our favor.

"I am aware that he has received a little more than \$1,500 a year from the invention; but it is an invention which took him years to perfect. He was a poor mechanic at the outset, and this paltry sum is a small compensation for so valuable an invention."

The House divided, 60 ayes, 64 noes, so the bill was defeated, and the Brass Kettle Monopoly comes to an end.

ART TREASURES FROM CYPRUS--ENGLISH CRITICISM ON THEIR DESTINATION.

There are two journals published in London which may be considered the organs of that exclusive class of British society who, whether from choice or from indolence to obtain the commonest information, possess and cultivate the most profound ignorance, not to say stupidity, regarding everything in anywise pertaining to the United States. We allude to the *Saturday Review*, which, in classical English and faultless rhetoric, gravely puts forward the most extravagant absurdities, and the *Pall Mall Gazette*, which, if we

remember rightly, especially distinguished itself during our late war by systematically publishing false reports of every Federal victory, and, with other rebel-sympathizing papers, revelled in predictions of grass growing in the thoroughfares of New York, and the untamed buffalo roaming over the ruins of the national Capitol. Both of these journals are the legitimate objects of the editorial scissoring of the balance of the London press, and, following the general example, the *Building News*, with a strange lack of discrimination, has culled from the valuable pages of the *Pall Mall Gazette* an article entitled "Art Treasures from Cyprus," which is a scholarly description of the collection of Greek and Phœnician antiquities, made by our late consul, General Di Cesnola, among the ancient ruins of that island. These relics were exposed for sale for some time in Europe, but met with no purchaser, owing to the high price set upon them. Recently, however, and in a late number of our journal, we adverted to the fact that they were bought by the management of the Metropolitan Museum of Art, and in proper time will be permanently located in that institution in New York city.

Now, if some obscure German principality had taxed its few inhabitants to the full extent of their incomes to purchase these works of art, and had entombed them in the dingy recesses of some out-of-the-way university where no one could possibly be benefited by them, save a few fossil professors, all might have been well. But unfortunately they are to go to America—and worst of all to New York—and there "waste their sweetness on the desert air" of barbaric and benighted Yankees. No wonder, then, that the learned pundit of the *Pall Mall Gazette*, whose whole æsthetic nature has been thus ruthlessly harrowed up, bewails their loss in the following manner: "And where are these materials going to for their final lodgment? Where, indeed? To New York, U. S. America. That seems a strange destination for a collection of antiquities which is not one representative of beautiful and popular forms of Greek or Greco-Roman work . . . and invaluable as the supplement of existing museums in centers of organized scholarship and research. The shipment of these things to New York means simply, for the present at any rate, mystification to the New York gaper, and sea sickness for the European archæologist. For the most intelligent New Yorker can get but moderate advantage out of the antiquities of this collection taken apart from their historical place in relation to antiquities of other schools and another aspect; and specimens of these last he does not possess and has little chance of coming by."

The first response to the foregoing remarks is the question which naturally occurs: "Why were not these inestimable treasures bought during the long period they were offered abroad?" But this aside, we perhaps may venture humbly to suggest to the above erudite authority that the American public, and especially the citizens of New York, are educated to a far higher standard of art criticism, and can appreciate the value of such relics in a degree somewhat superior to the cockney visitors, who would flatten their noses in something more than mere "mystification" against the glass cases of the South Kensington Museum, in London, did the collection find its way to that celebrated edifice. And further, we may add for the information of our cotemporary, that our metropolis contains gentlemen who are as familiar as the writer of the above with the galleries and museums of Europe, and consequently as thoroughly able to reap the advantages of comparison and kindred knowledge as any foreign "sea sick" archæologist that may deign to visit our shores.

It is about time that America and the Americans were better understood by the English public, who still persistently cling to the extravagant representations of the country supplied by Dickens and Mrs. Trollope. The public of New York, Boston, and, indeed, every other of our cities, appreciate scientific and artistic subjects with a zest unknown to the people of Europe. The English journals well know that Professor Tyndall, for example, justly celebrated as he is, could not command \$1,000 a night for a course of lectures in any city in the United Kingdom, and that no foreign operatic manager would listen to such prices, demanded and received among us by such musicians as Rubinstein, Lucca, or Nilsson. Our native artists, painters, and sculptors find in their own country patrons, in private citizens, who supplement their efforts with a munificence unheard of abroad; while, on the other hand, it is but recently that the European papers were regretting the fact that many of the finest gems of ancient art were crossing the Atlantic simply through the lavish expenditure of American connoisseurs. The fact of our being destitute of the great museums and galleries, such as are found in the cities of foreign countries, requires no other explanation than the youth of the nation. The need for such valuable aids, in the education of popular taste, is fully appreciated, and throughout the different States wealthy and public spirited citizens are laboring to found repositories of the choicest specimens afforded by science and art.

Such slurs upon the American public and upon our distinguished scholars, as are cast by the *Pall Mall Gazette*, will fail to influence the liberal-minded or progressive in any part of the world, while they serve to fully exhibit the narrowness, intolerance, and ignorance of the mind by which they were conceived.

THE description of a device for opening window blinds from within the casement, recently sent to us by a correspondent, occupies sixteen foolscap pages and the drawings sixteen additional pages, or thirty-two pages in all. It is well written and clearly described, every part of the device being illustrated in every possible position, the whole forming a curious example of exactness and prolixity. Most persons could have sketched and described the thing with sufficient clearness in the space of a single page.