

HEATING SURFACE OF STEAM BOILERS.

We are frequently asked to give a rule for computing the heating surface of tubular steam boilers. The matter is very simple, but the following explanation and example will probably be of service to many engineers.

The heating surface of a steam boiler of any kind is the surface exposed to the action of the fire which has water on the other side. The extent of this surface is measured exactly the same as any surface would be.

For instance, we have a boiler 60 inches in diameter, with 66 tubes 3 inches in diameter and 15 feet long; what is the amount of heating surface?

The operation of finding the effective heating surface in this case is best divided into three parts.

First—The surface of the shell. As the brickwork is, or should be, closed in at the center of the shell, we have as the effective heating surface one half the circumference of the boiler multiplied by the length of the tubes, that being the length of shell exposed to the fire. One-half circumference of shell 5 feet diameter, = 7.85 feet; length of shell, = 15 feet; $7.85 \times 15 = 117.75$ square feet in shell.

Second—That portion of the two heads between the two tubes. As the water line comes but slightly above the centre of the boiler, we usually assume it is half way. Then we have a surface equal to one entire head of the boiler covered with water and exposed to heat. A tube sheet 5 feet in diameter = 19.63 square feet; 66 tubes 3 feet in diameter = $3.23 \times 2 = 6.46$ square feet; total heating surface on heads = 13.17 square feet.

Third—The tubes. It is usual to reckon the inner surface of the tubes as heating surface. Then we have 66 tubes each 15 feet long. $66 \times 15 = 990$ feet of 3-inch boiler tubes. By the manufacturers' standard table the length of three inch tube required for one square foot of inside surface = 1.373 feet. Then 990 divided by $1.373 = 721$ square feet in the tubes.

Adding the above together we have—

For the shell, 117.75 square feet.

For the heads, 13.17 square feet.

For the tubes, 721.05 square feet.

Total, 851.97

We must proceed in a similar manner to obtain the heating surface of any boiler whatever. Usually about 15 square feet of heating surface in a tubular boiler is reckoned equal to one nominal horse power.—*Locomotive.*

CANADIAN SUPPLIES.

Dr. Lyons, M. P., writing in the *Timber Trades Journal* on the forest areas in Europe and America, and the probable future timber supplies, concludes with the following regarding Canada:—

"The call which for some years back has been made on Canada is perhaps the most serious problem in the question of future timber supplies. That she is very largely supplementing the requirements of the Union is well known, but to what extent it is very difficult to ascertain, as a very extensive trade is carried on across the borders and much timber shipped from American ports and credited to the States has but recently been brought within the States. Three very extensive timber agencies are well known: the "Ottawa Agency," the "Belleville," and the "Western Timber District." The Crown Timber Offices acts for the provinces of Ontario and Quebec and for the Dominion Government in the collection of State dues. The Ottawa draws about 8,000. Over four-fifths of the pine shipped to the United Kingdom is reported to be manufactured in that great valley, which is said to give occupation to 25,000 men. The area of the timber lands of the Dominion is roughly estimated at 250,000 square miles. It cannot be said that the valuable forest areas of Canada have as yet been defined by survey perpetrators has been satisfied with inspection of the tremendous ravages and grandeur of the scene thus criminally and wantonly produced.

No unified system of forest statistic exists for the Dominion as yet. Each province keeps for itself such records as it possesses. By the kindness of the Governor-General and Council this is about to be remedied, and I hope through

with sufficient accuracy. It is stated that the true forest area would scarcely cover a tenth part of the surface. The great Saskatchewan Valley, equal to thirteen states of the size of New York, is returned as chiefly prairie, and practically treeless. Oak crosses the border from Michigan and Ohio. It is asserted that in the provinces of Ontario, Quebec, New Brunswick, and Nova Scotia, the pine and spruce, the great material of foreign export, and under contribution for more than a century, will be entirely cut within a few years. Little and others assign a limit of seven years. The wooded lands are still counted at millions of acres, but in both the States and Canada unknown quantities of mere coppice and scrub exist, the timber of which would not pay its own transport to most moderate distances; while millions of acres still counted as forest are in the state of charred remnants of forests burned over for miles upon miles, and the timber of which has been totally destroyed. The recklessness of waste and belief in inexhaustibility cannot be more strikingly illustrated than by the well-known incident of forests set on fire purposely to show the grandeur of the scene, and allowed to burn themselves out without thought of rescue, when the curiosity of the his Excellency's kindness to be shortly in possession of full details as to the forest wealth of the Dominion.

By a recent Act, assented to in the current year, 19th of April, 1884, full power is given to the Governor in Council to make provision for the preservation of forest trees on the crests and slopes of the Rocky Mountains, in order to maintain throughout the year the proper volume of water in the rivers and streams, and to set aside and appropriate adjacent lands as forest parks.

With every state in Europe and America, and with the example of the great forest system of India before us, not yet forty years under conservancy, shall these islands alone stand aloof from the great work of forest conservancy and extension? Out of 77,000,000 acres it is possible for England, Ireland and Scotland to contribute, with advantage to their industries as well as their agriculture, something like 20,000,000 of home grown forests. The annual importation of timber and other forest produce reaches the enormous sum of £20,000,000 sterling per annum. The day her industries are paralyzed by failure of timber, now within measureable distance of us, this Empire must descend from her high place among the nations.

TRADE WITH THE ARGENTINE REPUBLIC.

The following letter appears in the *Quebec Chronicle*:

SIR, — A glance at the statement of shipments of lumber from the St. Lawrence to the ports of the Argentine Republic for the past season, will, I doubt not, prove interesting to all that have at heart the development of Canada's foreign trade.

On reading over the statement above alluded to, one must necessarily be struck with the immense increase in value of the exports of lumber over the preceding years, but while acknowledging with pleasure this fact we have also deeply to regret that our enterprising manufacturers have as yet taken no steps whatever towards introducing the results of their labour to the markets of this fast growing and progressive Republic. The port of New York alone exported to the country referred to, during the past year, \$4,000,000 worth of manufactured goods, nearly all of which are produced in this country. These consisted mainly of agricultural implements, edge tools, machinery of all kinds, barb-wire, fencing, nails, tacks, boots, shoes, prints, twillings, shirtings, preserves of different kinds, canned goods, and an infinity of other articles, most of which are manufactured or to be found in Canada. The question must therefore present itself. Why does Canada not participate in this important export trade?

The Argentine Republic is one of the most prosperous countries of the day; its exports and imports are immensely on the increase. New harbors are being opened; new cities built; railway lines traverse the country in all directions; ships of all nations crowd its ports and a steady tide of immigration is fast peopling the

country. Seven hundred large steamships visited its capital, Buenos Ayres, during the past year,—in a word everything in and about the country proclaims activity, energy, and a spirit of progress hardly appreciable to anyone unfamiliar with this favored country.

It therefore behooves our Canadian manufacturers to at once take the necessary steps towards introducing their wares in this Republic, which in a very short time will be made a large and valuable consumer. All information regarding the cost of transportation, duties, etc., etc., can be obtained at any of the Consulates of the Republic in the Dominion, and I shall be more than pleased to give not only all the information in my power, but will also personally assist by every possible means the favorable introduction of any of Canada's products, and the development of a trade in manufactured goods between the two countries.

With many apologies for trespassing so much on the space of your much-read paper, and thanking you sincerely for the privilege accorded me.

I have the honor to remain,

Sir,

Your obdt servt.,

J. ARTHUR MAGUIRE,

Consul-General of the Argentine Republic in Canada, etc.

Quebec, October 31st, 1884.

QUEBEC CULLERS' OFFICE.

The following is a comparative statement of Timber, Masts, Bowsprits, Spars, Staves, &c, measured and culled to date:—

	1882.	1883.	1884.
Waney White Pine...	3,104,648	3,513,515	2,193,453
White Pine.....	7,901,695	7,130,410	3,636,744
Red Pine.....	1,456,850	474,458	327,735
Oak	1,315,109	1,883,294	772,042
Elm	714,549	309,201	653,812
Ash	310,760	257,827	410,458
Basswood	1,471	2,244	4,121
Butternut.....	2,639	1,023	1,260
Tamarac.....	51,975	7,409	10,113
Birch & Maple.....	269,661	138,593	201,289
Masts & Bowsprits...	23 pcs	— pcs	— pcs
Spars.....	51 pcs	— pcs	41 pcs
Std. Staves.....	363.1.1.27	677.3.0.15	93.6.1.12
W. I. Staves.....	117.1.0.1.7	619.2.3.20	260.3.0.19
Brl. Staves.....	75.4.3.23	115.3.0.10	9.7.1.0

JAMES PATTON,

Superior of Cullers.

Quebec, Nov. 7.

THE IMPORTANCE OF A SUPPLY OF WOOD.

No one who is at all familiar with forests and their products, needs to be reminded of the importance of having at hand an abundance of wood of various kinds, or how much it contributes to the general welfare and happiness of a nation. But there are those who have not paid much attention to this subject who claim, and no doubt honestly believe, that the great progress made of late years in the use of iron in the place of wood in building houses, bridges, piers, ships and other structures, are but indications of what is to follow and that in few years there will be no great demand for wood.

The building of railroads which reach almost every part of the country has aided in the distribution of coal, and made this in a great measure a more convenient and in many instances a cheaper fuel than wood, but in building these roads a vast quantity of wood has been used, and of the best kinds, not only for ties, of which nearly or quite three thousand are put down per mile, but on many of the roads wood is still used for fuel. There is now nearly or quite one hundred thousand miles of railroads in the United States, and we have only to multiply this by three thousand to ascertain that three hundred millions of ties have been used in their construction, leaving out of account the thousands of wooden bridges and other structures, in the building of which more or less wood has been consumed. The railroads may have assisted very materially in checking the consumption of wood for fuel, but they have probably more than balanced the account in the amount used in their construction, besides the three hundred million of ties must be duplicated every ten years, for the average life of railroad ties will scarcely exceed a decade, and with nearly all kinds, except the best oak, it is a year or two less.

The demand for railroad ties is not likely to

decrease, but increase, although as timber becomes scarce and prices advance, preserving processes will doubtless be employed to prevent rapid decay. Stone, brick and iron will also come into more general use for buildings, but the increase in population will also tend to increase the demand for wood for other purposes besides that of buildings.—*American Agriculturalist.*

LIST OF PATENTS.

The following list of patents upon improvements in wood-working machinery, granted by the United States Patent office, Oct. 28, 1884, is specially reported to the CANADA LUMBERMAN by Franklin H. Hough, solicitor of American and foreign patents, No. 617 Seventh St., Washington, D. C. —

307,313.—Barrel former—T. L. Lee, Memphis, Texas.

307,304.—Carpenter's gage—W. Wells, Cleveland, Ohio.

307,195.—Floor clamp—E. W. Holt, Corrina, Me.

307,332.—Lathe feeding mechanism.—M. Y. Ransom, Cleveland, Ohio.

307,233.—Plane—O. H. Pike, West Troy, N. Y.

307,112.—Saw guard—J. G. Groff, Connersville, Ind.

307,348 & 307,349.—Saw mill carriages, feed mechanism for—J. W. Stokes, Manist, Mich.

PATENTS ISSUED NOV. 4.

307,330.—Long turner.—R. E. Park, Sherman, N. Y.

307,575.—Lumber measure—E. C. Newton Batavia, Ill.

307,516.—Saw—H. Alley, Clifty, Ind.

307,708.—Saw drag—W. Cole, Menominee, Wis.

307,665.—Saw-hanging—G. A. Long, Northfield, Mass.

307,554.—Saw guide—W. Kirby, Byhalia, Miss.

307,608.—Saw mill circular—W. F. Parish, St. Paul, Minn.

307,600 & 307,601.—Sawing machine, circular J. R. Thomas, Cincinnati, Ohio.

A GROWING TRADE.

Canadian trade with the Argentine Republic—which includes that part of South America east of Chili, extending from Bolivia and the Brazils to Cape Horn—is growing. Exports have been made thither this year from Quebec of lumber, wool goods, rope, canned meat and vegetables, to the value of nearly two million dollars. No less than twelve and a quarter million feet of lumber has been shipped by two firms from that port. A quantity of this lumber shipped is on Government account, and will be used in the construction of public buildings in La Plata, the new capital of the Province of Buenos Ayres. The lumber shipped by a single lumber company of Montreal for different firms, largely to Monte Video, amounted, we are informed, to something over twenty-one million feet.—*Ex.*

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Catarrh—A New Treatment.

Perhaps the most extraordinary success that has been achieved in modern science has been attained by the Dixon treatment for Catarrh. Out of 2,000 patients treated during the past six months, fully ninety per cent. have been cured of this stubborn malady. This is none the less startling when it is remembered that not five per cent. of the patients presenting themselves to the regular practitioner are benefited, while the patent medicines and other advertised cures never record a cure at all. Starting with the claim now generally believed by the most scientific men that the disease is due to the presence of living parasites in the tissues, Mr. Dixon at once adapted his cure to their extermination; this accomplished the Catarrh is practically cured, and the permanency is unquestioned, as cures effected by him four years ago are cures still. No one else has ever attempted to cure Catarrh in this manner, and no other treatment has ever cured Catarrh. The application of the remedy is simple and can be done at home, and the present season of the year is the most favorable for a speedy and permanent cure, the majority of cases being cured at one treatment. Sufferers should correspond with Messrs. A. E. DIXON & SON, 305 King street west, Toronto, Canada, and enclose a stamp for their treatise on Catarrh.—*Montreal Star.*