THE "BOSS" TURBINE WATER WHEEL.

THE accompanying illustrations represent a new turbine water wheel recently placed upon the market by the Wm. Hamilton Manufacturing Company, Ltd., of Peterborough, Ont.

The "Boss" turbine wheel is the outcome of a series of very many expensive experiments through a long period of years, and every point devolved, either by practical use or scientific test, has been seized upon in deciding precisely what is the best construction of every part of the wheel. The result of their experiments is the "Boss" turbine wheel of to-day.

The prominent features of this wheel claimed by the manufacturers are those of economy, simplicity of parts and durability. At no period of our country's history has there been such a demand for a first-class turbine wheel as now. Population and wealth have multiplied, but water powers have not, and not only this, but the volume of water in many streams has greatly diminished.

In the "Boss" turbine wheel the owners of water powers will find a motor not only unsurpassed in its strength and mechanical simplicity, but seldom equalled in its power and percentage, when varied from half to full gate. The wheels, during the many trials that the different sizes were subjected to, showed a percentage of useful effect of from 87 to 92 per cent. of that of the water, a percentage, we believe, that will be hard to beat. This percentage is not only what the wheels tested by means of the dynamometer has shown, and under the most favorable circumstances, but what is actually being done by the different-sized wheels recently placed by the above firm throughout the province.

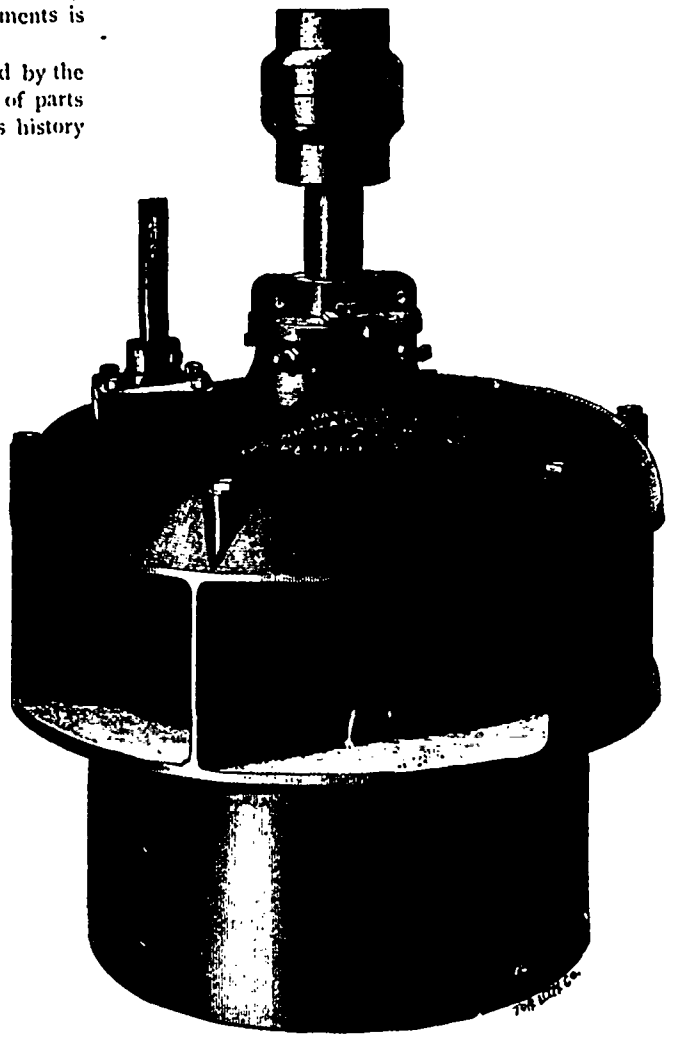
The wheel is simplicity itself—no gates to choke or clog, and all parts liable to injury are under cover and protected. The wheel case and draft tube are of one casting. The case has a series of graduated chutes so constructed as to direct the water upon the periphery or outside of the buckets at all points of the gate opening. The gate is circular in form and is mounted upon the wheel case, and has a series of balls interposed between the flange of gate ring and wheel case, forming the bearing; by means of the balls the friction between gate ring and case is reduced to a minimum. The gate is placed between the wheel case and the runner and revolves horizontally, there being a series of openings on the gate ring to register with openings or chutes on the wheel case. The gate is opened or closed by means of a rack and pinion under cover of the dome and protected from injury.

The runner is of one continuous casting, having no bolts or bands to become loose. The illustration clearly shows the construction of the runner.

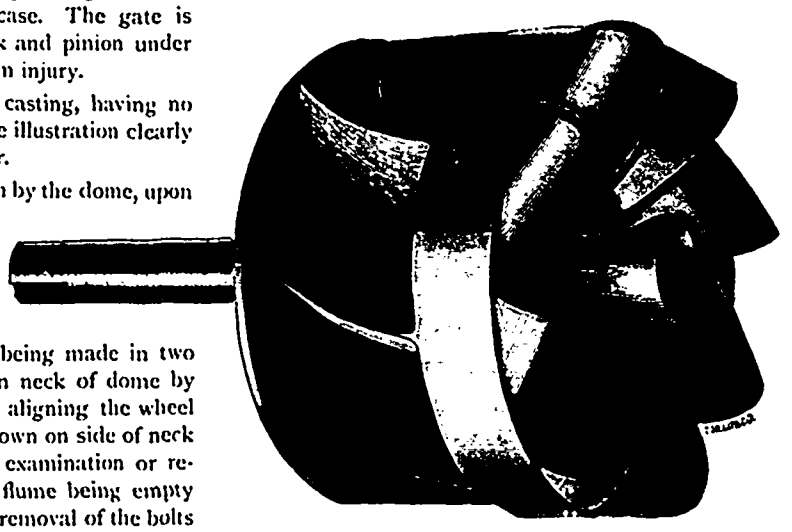
The wheel is completely covered in by the dome, upon the neck of which is carried the stuffing box, by means of which the wheel is aligned true. The construction of the stuffing box is a departure from the old-time method, requiring no hardwood blocks, being made in two parts bolted together and held upon neck of dome by means of screws. The operation of aligning the wheel shaft is done by means of screws shown on side of neck of dome. To remove the wheel for examination or repairs occupies very little time, the flume being empty and admittance being gained by the removal of the bolts as shown on dome or cover; the wheel is then ready for removal. One feature, and a desirable one, is that the wheel is removed from the top instead of through the bottom, thereby saving much time and annoyance to the millwrights or others who may for any reason require to remove the wheel or put it in place.

The wheel consists essentially of six castings; there are no gate rods or bolts to get out of order. From the illustrations it will be conceded at once that the design of the wheel and the arrangement of parts are such as to merit the commendation of all who have the care of or who may use water wheels.

The wheel is manufactured in fourteen sizes, from six up to sixty-two inches. All who contemplate the improvement of water powers are invited to correspond with the above-named firm, who will furnish plans and estimates or other information upon all forms of water wheel work, including wheels erected upon horizontal as well as vertical shafts.



This wheel is highly suitable or woolen mills, grist mills and electric light plants requiring steady motion, and easily controlled by governor, and it is strong and substantial for saw mill and mining or other heavy work.



SAWMILL ECONOMICS.

IT was, only a few years ago, capable of demonstration that there had been little, if any, advance during the last forty years in the average product of the saw mills on a per capita basis. The old mulay saw would cut about 2,000 feet per man, employed from the pond to the yard, and the circular or band saw mill of five or six years ago would hardly do as well as that; but within a comparatively short time there has been a substantial gain in economy of production. This has been brought about by minor appliances and by a more perfect arrangement and systematizing of the business.

It used to be said that the steam log turner had doubled the capacity of the saw mill. This was to a certain extent true. It did largely increase the output of the mill, but it entailed added labor and increased the number of hands in other parts of the establishment, so that the per capita of the production was but little changed. The high-speed feeds also greatly increased the output without in any corresponding manner decreasing the cost. Now it is no uncommon thing to see a mill which turns out 3,000 feet per capita or better, though still in a majority of cases the production will be at or below the 2,000 feet mark.

Perhaps two of the chief factors in reducing the amount of labor are the log "kicker," so called, which removes the log from the chain as it is brought into the mill, and the log loader. Not infrequently a mill can be seen which is doing rapid work with no one at all on the decks, and very commonly one to two men will take care of a double-deck mill. Right in that spot there has been a saving of from two to four men. Another great saving has been made in handling cants to the gang or boards to the edger. Transfer appliances have done away with one to two men on each side of the mill. Again, transfers to the trimmers from the edgers have reduced the number of hands employed, and devices for automatically sorting lumber to lengths, and other conveniences at the tail of the mill, have lessened the number of hands at that point.

A well known millwright of the Northwest makes the assertion, and professes to be able to back it by a sufficient moneyed guarantee, that he can build a mill that will cut an average of 5,000 feet per man employed, counting from the foot of the log haul up to the tail of the mill, including the men who place lumber on the trucks ready to go into the yard. This arrangement, however, would not include the shingle and lath departments, except the men on the slasher, as those departments are independent, and should be figured by themselves in considering the capacity of the mill.

It is also probable that the band mill has had considerable to do with lessening the amount of labor employed. One edger and one trimmer could be arranged easily to take the product of two bands, and in any kind of timber the number of logs handled with the band is not so great as it is with the circular.

It seems to be evident that the saw mill business is coming to its perfection of development. Until the advent of the band mill and the appliances mentioned, with others, the sole result of invention and improvement has been to increase the production of the mill without effecting a saving in labor; but with the constantly increasing prices of logs, with the close competition prevailing and the appreciation by the manufacturers of the necessity for the utmost economy in the production a new era has dawned.

THE UTILIZATION OF WIND POWER.

THERE is a windmill in London perched high up on a timber tower erected on the top of a building on the City Road, not far outside the old "City" boundary. It has a sail of thirty feet diameter, and is quite a big affair when one climbs to the top of the tower. But what I specially wanted to note was the fact that this windmill is lighting the premises over which it stands.

Its upright shaft, which comes down from the mill, drives a horizontal shaft which carries a large belt pulley, and by this large pulley is driven a small dynamo. The dynamo generates a current which charges a battery of accumulator cells, and these in turn "drive" the lamps. At times, when the wind is low, the speed falls below what is proper for charging the secondary battery. To prevent this being charged at such low speed there is a cut-out held in by a magnet and kept out by a coiled spring.

When the magnet is weak the current is cut off from the accumulators, but when the dynamo is running at a fair speed the magnet is strong and pulls the switch into contact and the charging proceeds. The mill will run and charge all night and all day. In quiet weather it runs much of its time slowly, and, therefore, uselessly, but it also runs the night through, and I suppose would on an average do eight hours work in twenty-four.