Correspondence

Flat-faced Frictional Gearings.

Messrs. Editors:—As your paper is one of the principal mediums for the diffusion of useful knowledge, especially in relation to mechanical affairs, I desire to give to the public through its columns a statement of experiments and results in running machinery by friction instead of by belts in getting up the requisite motion for the various operations in any manufactory.

The experiment was first tried on an extensive scale, in this region—and, so far as I know, anywhere—by Mr. Charles Lamb, an enterprising and successful sawmill owner in Clinton, Iowa, and it proved so successful, economical and handy under his management that within the past year all the other sawmills (seven within a circuit of two miles aronnd his) have, at great expense, remodeled their machinery so as to adapt it to this new device. Two of these mills beside Mr. Lamb's are gang mills, and the others run muley and rotary saws.

This general introduction of it by all those best cognizant of its value and defects is proof positive that it is just the thing, and that the knowledge of it should be spread abroad so that all others may avail themselves of its advantages.

I will now, as well as I can, describe the mode in which it is applied.

The motion to the main shaft is of course produced by the engine crank direct, or the water wheel, as the case may be.

Upon this shaft are built strong wooden-faced pulleys, as in the old manner of belting from it, except that it is necessary that these pulleys be built entirely of their segments, presenting as little end grain of the wood to the surface as possible, and that the wood of which they are made be soft and tough. Basswood is said to be the best for this purpose, though soft maple or cottonwood, or any soft wood, will answer.

These pulleys may have faces parallel to their shaft, or be levelled at any angle required, to suit the direction of the various countershafts drawn by them. They must be put up strongly with their segments, glued or painted together, and their faces turned off with great accuracy.

Upon each countershaft required is placed a strong iron pulley of the same face as that on the main shaft that is to drive it, but its diameter may be made to suit the motion required. This pulley should be near the end of the shaft, and may overhang or not the movable bearing, by the motion of which, applied by levers, it is forced against the face of its driver. The motion required to place it in contact or remove it from contact is so slight—less than the eighth of an inch—that it has no influence on the correct running of the shaft. The box that supports the shaft should be made to slide upon an iron plate as a support, with short slots and bolts to hold it to its place, and some "process" to which a lever may be attached by which the workmen can command it.

In most of the mills here each separate machine—gangs, muleys, rotary saws, lath, shingle and planing mills are now run by its own countershaft, geared either to the engine shaft or to some one of the main countershafts, thus allowing each workman to stop or start his own machine in an instant, without interrupting any other, and without having to throw off or put on belts, entirely doing away with the necessity of using loose pulleys. This and the saving of belts is the great advantage arising from its use.

It is claimed by Mr. Lamb that the power required to do a certain amount of work is no greater when applied in this way than in the old style. Two or three mills here that have been modelled over on the friction principle, now do as much if not more work with the same engine and boiler.

And now in relation to the size and face of pulleys required to use up a certain amount of power. It does not appear that it makes much difference what is the relative size of the two pulleys rubbing together. Their faces of course are equal. As a general rule, I think they should have about one-third more face than if run with a belt. Mr. Lamb runs two gangs, each with a pulley of about 24 inches face and 3 feet diameter. A mulay or rotary sawmill can be run with a friction pulley of 12 to 16 inches face. I am running a heading circling machine and small edging saw together with a pulley 10 inches diameter, 6 inches face, working much more effectually than the same pulley did with a 4-inch belt, and less heating of the boxes.

I think 50-horse power may be applied to a pulley of 20 inches face without danger of loss by slip, and without the necessity of pressing the surfaces so tight together as to wear or heat the bearings more than the pull of a belt of about the same capacity would.

The more rapid the motion the more effective will be the friction contact with the same sized pulley. With very slow motion it does not do as well, and it is a better appliance for getting up motion than for reducing it.

I am aware that running machinery by friction is no new thing, but what I claim for Mr. Lamb and for this region is that we have demonstrated by extensive experiment that it can be economically applied to the propulsion of any kind of machinery, at a great saving of belting and time.

I hope that the hurried explanations I have made will be sufficient to enable any person interested to try it for themselves; but if any more is needed it will be cheerfully given. Chas. Boynton.

Lyons, Iowa, Oct. 2, 1864.

[The principle and the adaptation of frictional gearing to machinery is no new thing, but like many another one it languishes for some reason, for it is but little used. It is very many years ago that we saw a line of shafting driven by wooden friction gears, which had been in operation a long time. A question has arisen which we should be glad to see settled by positive demonstration; this is, whether friction gearing consumes more power than ordinary gearing. This is a mooted point, but one that is easily put at rest. Very many letters from correspondents have been published on this subject, but some of them are evidently the result of imperfect observation, or else merely state the fact of having used such gears with apparent economy. We shall take great pleasure in printing letters having specific information on this point.—Eds.

New Mode of Avoiding Scale.

Messrs. Editors:—Accompanying this you will find a sample of what I suppose to be sulphate of lime, the manner of obtaining which will unquestionably be of great interest to engineers who are compelled to use "hard water" in their boilers.

An engineer of this city having occasion to open a horizontal heater-box about six feet in length, and elevated six feet above the force pump, found floating on the surface of some water which had not been drawn off by the pump, a white powder, and which he concluded could be floated out and collected by inserting a small gas pipe half way up the side of the heater-box, so as to act as a waste-water pipe. By keeping the water in the heater on a level with the outlet of the pipe, and allowing it to drip rapidly, he has collected bushels of this substance, which would otherwise pass into his boiler and add largely to the scale deposited on the shell and flues. This appears to me to be a simple and effective contrivance, and well worthy of attention. The philosophy of it may be that by heating the water the sulphate of lime is set free and floats on the surface.

This same engineer uses green oak wood in his boiler to cut off scales, having tried a patent mixture without any benefit; however, his choice for this purpose is a half bushel of the bran of barley.

I ran a mill for several years, and found green oak sawdust to be the best material to prevent scaling; the objection to it is if the engine stands idle for a few days the cylinder, piston rod and slide valve rust excessively. J. T. D.

Springfield, Ill.

[On testing this powder with sulphuric acid we find it to be carbonate of lime—just the thing for scale. It may contain a trace of sulphate of lime, magnesia and other salts, but if so it is only a trace. As carbonate of lime is less soluble in hot than in cold water, it is not strange that it should separate when the water is heated. We do not understand why it should rise to the surface. This plan for partially purifying water before it is admitted to boilers is well worthy of attention.—Eds.

The Oil on a Kerosene Lamp.

Messrs. Editors:—Your explanation of "The Moisture on a Lamp Chimney," in the Scientific American, for Oct. 1st, suggests to me, what I wonder I have not thought of before, to ask of you an explanation of the deposit of petroleum, continually being made (no more or less rapidly while burning than at other times, as I can discover), upon a petroleum lamp. Respecting this deposit I have observed two peculiarities. 1st, While it is so abundant upon the globe and the burner as to soil whatever touches them, there is none perceptible upon the chimney, and none upon the pedestal and surrounding objects. 2d, After the lamp has stood a day or two there is no further accumulation of the deposit upon it. If you, or any of your readers, can give the true philosophy of this, you or some one else will probably soon be able to suggest a convenient remedy of what is at present a very great annoyance. T. H.

Fall River, Mass., Oct. 3, 1864.

[Petroleum is more subject to capillary attraction than any other substance known, and we presume the phenomenon observed by our correspondent is due to this property. The fluid climbs up the wick and so over upon the outside of the lamp. Its progress would be facilitated by the presence of dust upon the lamp.

Machinery vs. Man-power.

Messrs. Editors:—Knowing that you like to hear of anything remarkable in the way of labor-saving machinery, I herewith send you something astonishing in the way of machine planing. Messrs. S. & G. Rork, of this city, received orders this morning to tongue and groove 4,000 boards. The captain, who was to carry the stuff, being in a hurry they put their machines to their highest speed. Noticing the remarkable speed with which the boards went through one of the machines I thought I would time it, and found that 19 boards passed through in two minutes, this would be 570 in an hour, and 6,270 in a day (11 hours being the mill day). A man, at a liberal estimate, could not put in a tongue and groove and plane more than four boards an hour; so that this machine, with one man feeding and two men taking away, did as much work as 142 men. Is not this saving labor? T. A. McIntyre.

Albany, Oct. 10, 1864.

Who has a Bread-slicer?

Messrs. Editors:—In our large establishment it is desirable to have bread cut in a time, and labor-saving manner. I have searched the city through in my efforts to find a suitable machine for the purpose, but without success. Can you inform me if there are such things made, and if so where they can be seen?

Charles C. Burns.

Philadelphia, Oct. 7, 1864.

[We should think some of the small tobacco-cutting machines might answer, if they are not too costly and complicated. We have had many inquiries for a handy bread and meat slicer, but doubt whether there is such a thing. Inventors should take the hint.—Eds.

NEW BOOKS AND PUBLICATIONS.

History of the Processes of Manufacure and Uses of Printing, Gas-lighting, Pottery, Glass and Iron. Illustrated. John Bradburn, Publisher, No 49 Walker street, New York:

The growing interest which attaches to all industrial works, or those which treat lucidly and practically of the arts and sciences, will, no doubt, secure a wide circulation for this volume, more especially since it is compiled from the *Encyclopedia Brittanica*, a standard work of high character. The popular magazines find no articles so attractive as those which give detailed accounts of manufacturing operations. In this volume the different trades alluded to are illustrated and treated at length in a comprehensive manner, and the reader may derive much valuable information from a perusal of it. Doubtless further extracts from the authority in question would prove acceptable to the general public and profitable to the publisher.