

### JIM AS AN ENGINEER.

Jim's a good-natured happy-go-lucky; he's served his time in the machine shop, knows all about blacksmithing, and as for a stationary engine, why bless your soul, he's designed more than you ever saw. His uncle was a big stockholder in the company, and Jim was sent up to make himself generally useful, and show the country bumpkins a thing or two.

When he came all the places were full, so Jim swept up the shop and did some helping. To be sure, he left some chips under the laths and the bench was not very clean; but you know, Jim was an engineer and machinist, and not a roustabout.

At last business picked up and Jim was set to work running the engine nights. Then he was in his glory. First he thought the globe valve on the feed-pipe ought to be shut. Of course he forgot to open it when he started the pump. Well now you just ought to have seen that packing come out, and the water squirt over the engine and machinery. Jim caught a good mouthful and then left, and never stopped till he was out-doors. It rather scared him, but in a night or two he was ready to try another dodge.

The pump didn't leak, but Jim thought it needed packing, or anyhow that gland must be screwed up, and up it went; and the first thing he knew the plunger stopped, stuck tighter than a drum. Well, the engine went on serenely, and the set screw that was to have held the crank cut a nice little groove around the shaft.

Now that valve and motion is all of a kilter, and needs resetting. So one night while the men were at lunch, off comes the steam-chest cover, and the valve is reset. Engine starts a little lame, but Jim knows she will soon get over that. But pretty soon there is a rattle, the engine limps worse and worse, and then with a final rattle she stops. Investigation showed a nut off the valve stem. It had dropped into a steam port, been blown out into the exhaust and up the smoke stack, till it struck the elbow, when it dropped back upon the vertical boiler, where it was found next day.

Then Jim thought that perhaps it was not the valve after all. The pound must be in the eccentric straps and I'll just tighten them up. Well, now, almost before he could put that monkey-wrench down on the bench there was a loud snap, and a broken eccentric rod went whirling around with the shaft. This time the eccentric and strap were both cut and the rod broken. Jim smokes away and says the engine is no good. Manager thinks about the same of Jim's engineering qualifications, and gives him a job where he won't have quite so good a chance to raise Cain, but Jim was still alive, and didn't fail to let us know it.—Power.

### CARE OF EMERY WHEELS.

It is common custom when an emery wheel is removed from its spindle to abuse it. Some hang it up on a nail, with one side exposed to the air of the room and the other side against a damp brick or wooden wall. Others lay it about on an uneven bench, and others, again, take the trouble to put it under the bench, one edge against the damp ground and the top side leaning against the back of the shop. When they want to use it again they find it all out of balance, perhaps warped out of flat and with its corners clipped or damaged. Then they write the maker that the wheel doesn't run true, and they want another one for it, without charge, or they will, notwithstanding its damaged condition, mount it on the machine and go to work with it; when it bursts and maims the user, emery wheels will be called dangerous tools.

To much care cannot be taken of an emery wheel by the man who uses it. Emery is, as before stated, a silicate of alumina and iron, emery contains water enough to make it have an affinity for water, and to a certain extent oxidize or rust, and therefore swell in size. If, then, a solid, but porous wheel is subjected to dampness, or to unequal action of air and dampness, it may become injured. It certainly is injured by having the corners clipped off by lying about under a bench with old junk, and it should get more sensible treatment.

A good plan for keeping all emery wheels would be to lay them in a box or drawer, in dry sand or sawdust, keeping them with as much care as one would with an edged tool or razor. Too much care would do no harm.

If, upon receiving an emery wheel from the maker, the user would tap it lightly with a hammer, he will find it has a note or sound. Now, if when he uses the wheel after an interval of repose, he would again tap it lightly with his hammer in the same way, he will notice readily any change of sound, or ring. If the wheel, on being tapped, sounds dead, or if it is cracked, he will readily notice the change in sound. This change is the only intelligence any solid wheel possesses; the man who uses it must govern himself accordingly.—Mechanical Engineer.

### CARE FOR CIRCULAR SAWS.

The care we take of a circular saw makes it possible to do either the poorest or the best work. We may have the very best table, the finest gauges, and the best saw the market affords, but unless they are well taken care of it is utterly impossible to do a nice piece of work with them; while on the other hand, if we keep them in fine condition, even with inferior tables and appliances, they will show their care by the superior work done. Even under imperfect conditions aside from the saw, if we keep it sharp it will cut easy, and if set perfectly true, with the teeth of an even length, it will cut smooth, though it stick up through a rough board instead of a table made of alternate strips of walnut and ash, shallacked to perfection and polished until you can see your face in it. There is a combination of things that makes a saw run well, as much as there is a combination of letters to make a word, or of figures and signs to make a problem in arithmetic; and unless the combination is perfect we fail to make good work.

Let us see what the combination is then if we agree to the conditions specified: 1st, a true plate; 2nd, an even set; 3rd, the teeth all of an even length, so that each tooth shall do its share of cutting; 4th, the teeth filed to a uniform level both front and back, so as to give all the points the same shape; 5th, and last, though not by any means least, to give all the teeth the same size and shape without regard to the level. The reasons why we should have a true plate are obvious to the most casual observer. The stiffness of the plate depends on its being true, for just as soon as it is the least sprung, it has lost its backbone, and it will be dished first on this side and then on that, and we cannot trust it for anything, even the very plainest kind of sawing.

There is a wide difference of opinion about a sawyer straightening his own saws; while one may be able to do it there a thousand who cannot do it well. This is a part of caring for saws that if one cannot do it well he had very much better not try to do it; and yet every sawyer should be able to tell when a saw is sprung, and have it taken to a professional in that business and have it made right, for it is very much cheaper to have it right in the first place than have some one try to learn how to hammer a saw and almost ruin it and then be obliged to have to take it to some one in the business. This is a poor way to save money, and if any one is just starting and with a small working capital, he has little time to spare to teach his workmen how to hammer saws. But you want to know just when a saw needs straightening, and have it well done, and you want to know enough about a saw to know when it is well done. This is one part of caring for saws, and whether one can straighten a saw himself, or can tell when it ought to be hammered, he in either case is properly caring for it. It is needless, perhaps, for me to say it, but it is nevertheless a patent fact, that not one in ten sawyers in the country properly understands this part of the business or has the right kind of tools to do either the one or the other.

We would now come to the second part, a true, even set. A saw perfectly round and each tooth as long as the others might perhaps come in first, but as I have taken up setting we will go on with it and take the length of teeth in its turn.

There are a very few persons in this world

that can set a saw by their eyes and never use a gauge, but those persons are almost as scarce as hen's teeth, and the best way to use a good gauge and have each tooth come just to it, and not almost to it and another a little too much out, for these two littles make a "mickle" and will surely tell on the stuff being sawed.

On ordinary coarse work, like ripping up plank for studding, or for any stuff to be planed and jointed in a machine, I would certainly use an upset, as this keeps the outside points of the tooth full and sharp, which is a very necessary point in making a saw run well. As soon as the outside points become rounded, no saw can be trusted to do good work even in the coarser kinds of sawing, but they do very much better even then if they are properly set by having every tooth set just alike. I know this point of setting is held in high esteem by many who call themselves good sawyers, but I hold that it is one of the positively essential points to make a saw run both easy and well.

Now we come to the third count, keeping a saw round, and every tooth exactly the length of all the rest. How many shops and mills throughout the country can we go into where saws are used and not hear that confoundedly annoying sound, gig-gig-gig of saws that are running out of round. This comes from two causes, one of which is the hole in the saw is a little too large, and the saw is put on regardless of this fact, and if a saw be even so round, if put on the arbor this way, it is impossible to cut both sides alike, for it becomes an eccentric just as soon as put on and, pitiful to relate, always remains so. Very many, it is true, have a mark and always put it on in the same place—the marked side up, but this only half remedies the fault, for it will crowd one way or the other and is never exactly round. There is only one way to remedy this fault, and that is, by some means make the saw fit the arbor nicely. The other course is the common one. Saws are run week in and week out and are never trued, and a saw should be faced or trued up once a day if it is doing anything at all. Keep a nice piece of common grindstone and hold it up to the saw till it just touches, and then pass it carefully across the face of the saw till every tooth is hit. Now take off and file up nicely till the points come up to a fine edge without turning a burr if possible. Don't file and file till a burr is turned up like the fingers of a Hindoo devotee, because if you do the saw is out of shape again and needs truing up as much as it did before you touched it. A little care and the light falling on the point of the tooth so you can see what you are about, will give you a habit of filing just enough and no more.—Cabinetmaking and Upholstery.

### CEDAR.

It occurs to us that if red cedar was properly introduced in this market, and its merits once thoroughly known to the consumer, it would become a very important factor in the lumber interest of the city. It is a matter worthy of comment that red cedar fence posts and red cedar dimension is in less demand in this market than in any other of the country; and this, too, in the very face of the fact, of all timber that grows, there is none possessing such lasting, such imperishable properties, if you please, as red cedar for fence posts. We recognize the fact that it cannot be secured in this market, so as to be sold to the consumer at anything like the prices for which white cedar is offered, but we see no economy in paying 15 cents for a white cedar post that will last but five years, when for 30 cents a red cedar one can be had that will last a generation of years. We were not a little surprised to know that some time since a couple of Tennessee gentlemen shipped a carload of red cedar posts to this city, and came in person to dispose of them and, if possible, lay a foundation for the future trade, but their experiment resulted in a deplorable failure, not only to receive a consideration for them that justified them in bringing them to this market, but in making any arrangement for future trade.

We cannot understand why it is that a wood possessing such valuable merits, not only for

posts, but for the building of clothes closets in dwellings, is so little in demand. Where cedar is used in interior work vermin and moth will be unknown; and it is susceptible of beautiful finish that adds to its value as a wood for house building purposes.—Lumber Trade Journal.

### TIGHT BELTS.

A large quantity of belts is required to transmit a little power. The sooner we investigate and believe the above fact, the better it will be for our shafting, machinery and coal-heaps. We may look at the fact as we please, it will bear it, and find that a slow running belt to carry a given power must be very wide. If running at high speed, we must have the same number of square inches of belt passed over the pulley, but the belt need not be as wide to do it.

When a belt slips, the most natural action on the part of the attendant is to throw a handful of powdered rosin between belt and pulley. The next move, when rosin fails, is to tighten the belt. Often we find belts strained up until they are tight enough for fiddle strings, until hangers are pulled out of line, boxes cut and shafting sprung.

A certain machine company drive their works by long loose belts which claim attention from their very looseness. These belts are 10" to 12" wide, about 16 feet from pulley to pulley, and are slack enough to permit the upper or slack side of the belt to "bag" down 12' or 18', a plane passing through the two shafts being about 45° from the perpendicular.

If this machine company had followed the example of many power users, they would have used belts 5" or 6" wide, strained them very tight, and have been continually troubled by the belts breaking and wearing out. The belts above described, ran upon large pulleys (from 24 to 48) having a speed of 250 or 300 revolutions per minute.

Probably these belts would have done one-half more work than was put upon them but from the fact of being loaded light, they did their work with very little wear and tear. They needed very little looking after, save to keep them oiled and cleaned.

At the Novelties Exhibition at Philadelphia, a centrifugal pump was shown raising a very large quantity of water, and being run with a 1½" belt. Here, high belt-speed was used as a factor, but the little belt was strained very tight. It will soon give out and need constant patching.

When putting up a machine to run by a high-speed belt, don't make the mistake of cutting down the width of the belt too much. Let it go wide enough to transmit the required power without being too tight.

A certain builder of gauge lathes built a lathe to make button-hook handles. The handles were about ¾" or ⅝" in diameter, and 1½" long. When the belt was at its highest speed it ran over 4,000 lineal feet per minute, yet the belt was made four inches wide. Just think of it; a round sewing machine belt would almost have done the work, yet here was a four inch belt. The builder of that lathe says he would do the same thing again, for the belt service was complete, there was no slip of belt, no excessive friction, and the lathe spindle always ran true and cool.

When we see a man putting on a 14" belt with clamps, and using a 24" monkey-wrench wherewith to screw up the clamp bolts; then we can say to ourselves that this man is doing a poor job.—American Machinist.

A TELEGRAM from Washington in regard to the Morrison bill says:—The imports of articles of timber and lumber named in the bill as affected by the proviso as to export duty are imported from Canada, which country as far as learned imposes no export duty on the articles named, therefore the proviso has little or no effect." If pine and spruce are not included in the proposed free list, as Mr. Little believes, then, this statement is correct; and it would appear to confirm the impression that Mr. Morrison does not propose to place pine and spruce lumber on the free list. If, however, he wishes the provisions of the bill regarding lumber to be of benefit to anybody those kinds of lumber should be included.