

**Improved Expanding Mandrel.**

Every machinist must at some time have found trouble with the ordinary mandrels in use. Not only with mandrels, but with taps, rimmers, and similar tools. It often happens in shops where much repairing is done, as on railroads, that a great deal might be saved if the thread of a tapped hole could be made a little larger, when worn, instead of making it an eighth bigger, as is the usual plan in the absence of anything better for the purpose. The same remark applies to rimmers and boring tools; if the rimmer could cut a little larger the hole could be made round. And so on through a great many incidental cases within the experience of all.

The subject of the present illustration is a tool that supplies the want in question. In detail, it is an arbor, A, having any number of grooves, five in the present instance—fitted with keys, cutters, or expanding tools, B, according to the nature of the work or office of the tool.

A screw thread is cut on the body of the mandrel, and a portion of it is left in the center, as at C, to strengthen and prevent springing. The cutters are beveled at each end, and confined in their places by nuts, D, so that it is only necessary to slacken them off and slide the cutters down in the tapered grooves to expand or contract their outside diameters, and thus adapt them to all kinds of work. This can readily be made a most useful implement, as before stated.

It was patented through the Scientific American Patent Agency Dec. 19, 1865, by John Critchley, of Portsmouth, N. H. For further information address him at that place.

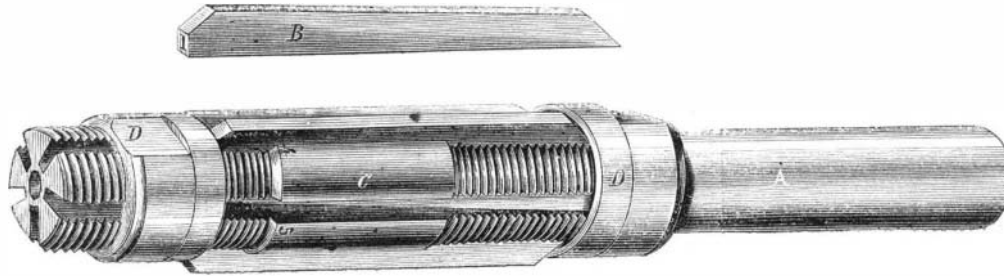
**St. Elmo's Fire.**

On the morning of the 7th of last month the curious phenomenon known as "St. Elmo's fire," was observed in the Irish Channel, by Captain Briggs, of the steamer *Talbot*. About one o'clock A. M. on that day the *Talbot* fell in, off the Isle of Man, with a heavy snow storm, which lasted three hours, during nearly the whole of which time from each mast head of the vessel, and also from each gaff end, a beautiful blue light was seen to proceed. During a part of the time a similar light proceeded from the stem head, and this light, being in an accessible position, was closely examined by Captain Briggs. "I found," he says, "that the light which appeared large at a distance, was made up of a number of jets, each of which expanded to the size of half-a-crown, appeared of a beautiful violet color, and made a slight hissing noise. Placing my hand in contact with one of the jets, a sensible warmth was felt, and three jets attached themselves to as many fingers, but I could observe no smell whatever. The jets were not permanent, but sometimes went out, returning again when the snow was heaviest. This was from one to three A. M. At daylight I carefully examined the place, but no discoloration of the paint was to be seen. The stem in this part is wood, with iron plates bolted on each side, and it appeared to me that the jets came out between the wood and the iron. The barometer stood at 29.1 inch. The ship is an iron one, but I did not observe any alteration or other effect upon the compasses. I have seen the same phenomenon abroad, but never before in these latitudes." Professor Frankland, of the Royal Institution, who has communicated Captain Briggs's account to the *Philosophical Magazine*, mentions that a thunder storm passed over Cheshire on the evening of the 6th, and points out that the brisk discharge seen by Captain Briggs to issue from various parts of his ship indicates a negative charge either in the surrounding atmosphere or in the snow flakes which were falling so thickly at the time.—*Mechanics' Magazine*.

**INCREASED TAX UPON INVENTORS.**

The Commissioner of Patents in his Annual Report to Congress, recommended an amendment to the law, providing that upon all appeals from the primary Examiners to the Examiners-in-Chief, that a fee of \$10 be

required of the appellant. The Committee on Patents reported to the House a bill based upon the Commissioner's recommendation, which was considered and passed. On January 1, 1866, there were over \$130,000 surplus to the credit of the patent fund, which has been extracted from the pockets of inventors. There is, therefore, no good reason why this extra tax should be put upon this useful class of our citizens for the right to appeal.

**CRITCHLEY'S EXPANDING MANDREL.**

Applicants for patents now pay enough for their privileges. We hope, therefore, that the Senate Committee will report against the House bill.

The measure is uncalled for, and we consider it unjust. If the Patent Office was running behind in its expenditures, then there would be some reason for the proposed bill. Instead of this, the surplus to the patent fund is constantly increasing.

**BROWN'S SELF-CLOSING GOVERNOR.**

When governor belts become unlaced and slip off the pulley, the engine runs away, and in a short time



gets up such a velocity as to greatly injure the work and machines. It is desirable to avoid such disasters, and the simplest and most direct agent for the purpose is the best.

The one here shown is the essence of simplicity

The plan consists in making the bearing, A, the driving shaft, B, runs in, movable horizontally on the frame, C. When at work, the tension of the belt holds the pulley, shaft, and valve in the chest, D, below, in their proper position for driving the balls, and for supplying steam to the cylinder; but so soon as the belt slips off the bearing, A, is thrown around by the spring, E, acting on it, turning the valve in the chest by a square, F, formed on it at the top, so that the

openings through which it receives steam are closed, stopping the engine directly. The valve can be set so as to close only partially instead of wholly, and thus maintain a moderate speed on the engine. These governors can be quickly applied to any engine, old or new, and will prove very satisfactory. Rights for Western and Pacific States for sale.

For further information address Messrs. A. & F. Brown & Co., Nos. 57 to 61 Lewis street, New York.

**EXPERIMENTS WITH NITRO-GLYCERIN OR BLASTING OIL.**

On the afternoon of the 5th, Mr. Nobel, the Swedish engineer and inventor, who has now become famous in connection with nitro-glycerin, conducted a series of experiments at Nolte's quarry, on Eighty-third street in this city, with the design of showing that his blasting oil is not so dangerous as it is reputed to be. The gentlemen present, about twenty in number, appeared to be pretty well satisfied with the demonstrations, and several of them who had had previous experience on the subject, seemed to fully indorse Mr. Nobel's statements. At the end of the experiments there was no fear of being near the oil, and the packages were freely handled by some who at the beginning were careful to keep at a very respectful distance; it reminded one of the ancient fable of the fox and the lion.

The experiments were as follows:—A small quantity of the oil was poured upon a flat piece of iron and struck with a hammer. A sharp explosion was the consequence, but an examination showed that only the oil directly under the face of the hammer was consumed. A small vial of the oil was packed with dust saturated with an inflammable substance, in small wooden box. The saw dust was set on fire by means of a fuse, and in a few moments the oil exploded, with a loud report, and the box was apparently annihilated. A lighted match was applied to a small quantity of the oil, and it appeared that in that way it could not be exploded. Wood naphtha (methyl alcohol) was dissolved in the oil, and it was shown that neither by heat nor by percussion could the mixture be exploded. When the mixture was washed with water, the naphtha was thereby separated, and the oil resumed its ordinary explosive properties. The concluding experiments were to illustrate the practical use of the oil in blasting.

The experiments lasted about two hours, no accident occurred, and all passed off very smoothly, with the exception of the final tests, where there was some delay on account of the attempt to use fuses which were not properly prepared for burning under water.

We understand that the experiments are shortly to be repeated and on a larger scale.

MR. BECKWITH, Commissioner for the United States to the Paris Exposition, writes to Secretary Seward that there are as many assistant commissioners with him as he wants, and that persons really desirous of assisting the United States exhibition at that great fair can do so best at home.

STARCH PASTE.—This paste is often used by photographers for mounting their prints; but it is very apt to turn sour and moldy after keeping for a short time. If a little alcohol be mixed with the starch immediately after it has been dissolved, fermentation will be prevented, and the starch will keep good for a long time.