made either in England or America, fine iron screws being introduced instead of wooden ones. These articles have only to be seen by those who understand their use to be appreciated, and we notice the manufacture simply as a duty to our enterprising townsman and his excellent staff of workmen.— Woodstock Times.

## Graduating Plane Stock.

A Plane has been patented in the United States, adapted to finish curved surfaces with accuracy. This plane is designed to meet an especial want. It consists of a peculiar hollow iron stock, to the bottom of which is fitted a thin highly polished steel plate, or face, so as to bend up or down from the centre, at either end, forming a convex or concave surface, as may be required, and of any desired curve. The ends of this plate are held in their places by a set screw. The cutting iron is of the usual form, and is firmly secured by lever pressure, its position being easily changed without the use of a hammer or other tool. The plane works equally well within or around a circle, or upon a level surface. The same principles are appplied to the plow and rabbet plane.

They are manufactured by R. H. Mitchell & Co., of Hudson, N. Y.

## **Boiler Incrustations.**

The last number of Newton's London Journal has a long article by Lewis Thompson, M.R.C.S., which concludes as follows:—

"A few careful analyses had convinced us that this incrustation is not due to carbonate of lime, but to sulphate of lime, by which the particles of carbonate of lime are cemented together and converted into a crust. To prevent the formation of this crust, it is necessary only to destroy the sulphate of lime, which is easily done by adding 1 lb. of common carbonate of soda (washerwoman's soda) to every 300 gallons of water supplied to the boiler. This converts the whole of the lime into carbonate, which has no tendency to agglutinate, but remains as a semi-crystalline powder, that may either be collected by placing an empty ves-sel in the boiler, or it may be blown out at intervals in the form of milky fluid. In both cases the conducting power of the iron boiler is preserved, which not only facilitates the development of steam, but prevents the burning or oxidizement of the boiler. That it must also prevent or diminish the number of explosions is more than probable."

Le Technologiste gives an account of experiments on the value of chloride of barium for the prevention and removal of scales from boilers, where it consists principally of the salts of lime. In tubular boilers, to ascertain the amount of the chloride of barium required in any boiler, note, when an opportunity offers, the amount to which scale has collected and the time during which the deposit had been gathering; multiply its thickness in sixteenths of an inch by three-sixteenths of the heating surface of the boiler; and this product, multiplied by 1.65, will give the weight in pounds required to be used during a period equal to that during which the scale was collecting, and will be sufficient to prevent further deposit, and gradually to remove that already formed. As an example, suppose sufficient impurities in the water used in any boiler to deposit one-sixteenth of an inch of scale in six months, the heating surface to amount to 1,000 square feet:

$$1 \times 1,000 \times 3.16 \times 1.65 = 309,375.$$

Or, supposing one hundred and fifty running days during the six months, about two pounds per day.

## Proper Inspection for the Manufacture of Steam Boilers.

A few months ago we laid before our readers a summary of the report of the engineer of the Midland Steam Boiler Insurance and Inspection Company, and we now extract the following from the report of the chief engineer to the Manchester Association for the prevention of Boiler Explosions. In one month, he says, 373 boilers have been examined, and 98 dangerous defects met with. Threeexplosions had taken place in as many weeks in his district, through which one life had been lost, and four persons injured. Not one of these boilers, however, was under the inspection of the company, and competent-inspection would certainly have prevented the explosions.—The Ironmonger.

## Color vs. Tannin.

"Conceding, as all tanners do, the presence of coloring matter and *tannin* in the usual extract from bark, it may be worth while to press the inquiry a little farther and ascertain the office of each. Do we really comprehend the fact that coloring matter is distinct from tannin? Sometimes I doubt whether tanners really do comprehend this. But it is important that we not only admit the fact, but that we fully realize its significance. For the purpose of coming to a conclusion let me recommend a little experiment as follows :- Dissolve, say one pound of glue; make the glue-water as rich (strong) as possible, and then take the same quantity of pure tan liquor; let it be rich both in color and in tannin; precipitate them together, stir them for a moment, then let them stand until the leathery substance all settles to the bottom. If there shall remain an excess of tannin, draw it off and precipitate more glue water, until the glue is in excess, and then there will remain the coloring matter. Now take this coloring matter and try to tan leather, and then you will for the first time comprehend the idea that lies at the bottom of the tanners art This coloring matter will color the leather and penetrate the fibres, but it will not combine with the gelatin or glue of the hide. This will be proven by trying it on a piece of sheep or calf skin parchment. After coloring it will weigh practically the same as before submitted to the process; whereas if put into tan liquor it will increase its weight and expand its fiber and become leather-while in the first case you will have colored parchment-nothing more, nothing less. When this idea is fully understood, one of the causes of the variable gain in weight will be explained. Coloring matter is permitted to do the work of tannin. Then, too, we shall all understand how it is possible to tan leather with almost any vegetable extract—almost any weed will pro-duce a coloring matter—which, with plenty of terra-japonica, will make a very good leather. Hence the thousand and one patents on all these plants. Any experiment, however simple, that will convince tan-