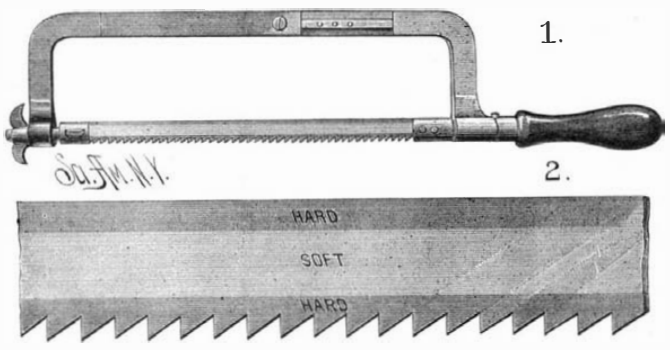
An Instantaneous Boiler.

M. Lestang describes, in the *Revue Industrielle*, a so-called instantaneous boiler, devised by M. Buisson. It is admitted that this problem has received considerable attention, but with not very satisfactory results. M. Buisson's arrangement consists of one or more steel cylinders, closed at one end, and covered at the other by a lid secured by six screws, and pierced with three holes. These vaporizers are from 20 to 36 inches long, and from 4½ to 9 inches in diameter. They are intended to be filled with material called by the inventors "metallic sponge," but consisting simply of small grains of iron, coppered in order to prevent waste by the steam.



CLEMSON'S IMPROVED SAW.

Through one of the holes in the cover a copper tube descends nearly to the bottom of the cylinder, where it terminates in a capillary opening. The steam outlet pipe is connected with another of the holes, the third hole being for charging the cylinder with granular material. The cylinder thus charged is placed in any convenient furnace for making it red hot. Water is then injected into it by means of a pump, and high pressure steam is instantly generated. This pump may, of course, be driven by the engine, which is supplied with the steam. There are means of regulation, whereby the quantity of water injected, and consequently of steam generated, depends upon the demands upon the engine. The injecting pump is thus a capital feature of the arrangement. It will be seen that this system of steam raising is primarily intended for the class of domestic motors, an essential feature of which is that the boiler must not be liable to explosion or to injury by neglect in supplying water or by overfiring. In these tubes there is nothing to be damaged, even if they are left in the fire for any length of time without water.

AUTOMATIC DAMPER REGULATOR.

The accompanying cuts represent a new, cheap, and simple device for regulating the draught in furnaces of steam boilers. This damper regulator (shown in section in Fig. 2) consists of but few parts, and contains no packing of any kind. The piston head is a loose fit in cylinder, and has a small hole through it for drainage, which is led off through a small pipe from the bottom of cylinder. The valve case contains a small valve, a steel spring, and an adjusting screw, with a milled wheel for setting the tension on the spring to vary the pressure required on the boiler; after once being set the machine is automatic, opening and closing the damper on a variation of only 1½ lb. of steam.

The regulator is adapted for use either on the ash pan dampers or dampers in the smoke pipe. When used on a locomotive, the regulator is fastened to a bracket on the left side of the boiler front, and connected to a rock shaft and thence to the dampers, as shown in cut, Fig. 1, so one or both of the dampers can be used. It has been found by actual test that the saving of fuel by the use of the regulator is one-sixth. This is caused by the regulator keeping the fire at an even heat, and closing in time to prevent the steam blowing from the safety valve, also by making it unnecessary to open the furnace door for relief, and thereby cooling the furnace sheets and causing the tubes to leak.

Its use permits the engineer to carry a regular feed. At the present time these regulators are in use on stationary, steamboat, and locomotive boilers, and are particularly serviceable, as no jar or motion affects them. The present style weighs 5 pounds, is 12 inches long, and 1½ inches in diameter. The inventors propose to soon make a smaller size for use on small boilers.

Further information can be had by addressing Mr. C. W. Townsend, Box 19, Newburg, N. Y.

AN IMPROVED SAW.

This saw is made of sheet steel in the usual way, with teeth upon one edge; but instead of being hardened upon one edge only, both edges are hardened simultaneously, the center or body of the saw being allowed to remain soft. By this method of construction the expansion of one edge of the saw due to hardening is opposed and counteracted by the expansion of the other edge, so that the saw remains straight. This also secures a very hard and durable cutting edge, and produces a tough and flexible saw, not liable to break.

This saw is the invention of Mr. Geo. N. Clemson, of Middletown, N. Y.; the sole agents are the Millers Falls Co., of 74 Chambers St., New York city.

Waterproofing Paper.

A new composition for waterproofing paper consists of the following ingredients, combined in the proportions stated, viz.: Resin, 50 per cent; paraffine, 45 per cent; silicate of soda, 5 per cent. These ingredients are thoroughly mingled by heating them together, and by agitation.

The paper to which the composition is applied is usually building or sheathing paper. The latter is taken in the condition in which it comes from the paper machine, being quite dry. A strip or strips of the paper, from a roll or other convenient holder, are conducted and drawn through the tank of hot composition, whereby the paper becomes well saturated with it, and upon emerging from the tank the paper passes between suitable rolls, which press any surplus composition from it, leaving it hard and smooth.

Sometimes the proportions of resin and of paraffine are varied from 5 to 15 per cent from those stated, retaining about 5 per cent of silicate of soda. Thus the proportions of resin and paraffine may vary between 50 and 65 per cent of the former and between 45 and 30 of the latter, making a composition by which the paper is rendered waterproof and durable, when exposed to the weather, and by means of which a surface finish both smooth and hard is obtained.—*Paper Trade Journal.*

A Thrifty Life Insurance Company.

The forty-first annual statement of the New York Life Insurance Company, which is published in another column, makes a very favorable showing, notwithstanding the depression of the last year in nearly all branches of business.

The New York Life Insurance Company has a surplus of several millions of dollars, and its officers and trustees are recognized as among our most substantial and trustworthy citizens.

This company issues all classes of policies, including non-forfeiture, non-contestable on account of suicide, Tontine investment policies, etc. Their rates for premiums, under their different classes of policies, are liberal, and in all respects the company's affairs are conducted with a business-like sagacity and due regard for the interests of its stockholders and policyholders.

Complementary Colors.

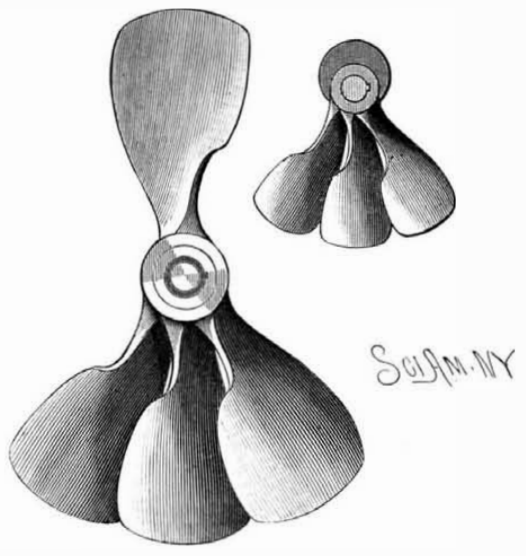
Select several cards of different colors, and in the center of each fasten by a little mucilage a small round piece of black paper. Place over the card thus prepared a piece of thin white tissue paper. The variety of hues which the black assumes is very striking.

A NEW SCREW PROPELLER.

The propeller here shown does not differ in any way from those of the usual construction, except that the blades are so placed or grouped about the hub as to be unequally distributed; in other words, there are, as in the example shown in the engraving, three blades upon one side of the hub and one heavy blade or a counterbalance weight upon the other. In extensive trials lately made at the Washington Navy Yard, under the supervision of a board of engineer officers, this propeller was found to be superior to the old form in regard both to speed and backing power. In addition, the engine turned centers much more easily with the new form—which is the invention of Mr. A. Vogelsang, of 347 Jay St., Brooklyn, N. Y.—and there was less vibration and thumping.

During these tests the new propeller was of the form shown in the large cut; the screw used by the board had four blades, equally spaced, 34 inches in diameter and 54 inches pitch. The diameters, number of blades shape of blades, surface area, and pitch were alike in both propellers, so that the only actual difference in the two was in the manner of arranging the blades. The new form developed far more power with less number of revolutions, under conditions as nearly similar as possible, thus showing that it had a firmer hold upon the water, and consequently less slip.

It is not necessary that the counterbalance should be so formed as to have a propulsive effect, since a propeller made with a weighted hub, as shown in the small cut, has given decidedly superior results.



VOGELSANG'S NEW SCREW PROPELLER.

The Tehuantepec Ship Railway.

New and important concessions were granted toward this great work on December 10 by the Mexican Congress, by adding to the previous land grants 1,700,000 acres, which makes the entire land ceded to the company about 2,700,000 acres, equal in area to more than twice the area of the State of Delaware. Coaling stations will be permitted at either end of the railway, to which coal from the United States or any other foreign nation co-operating with Mexico in guaranteeing interest on the bonds of the railway company will be admitted free of duty, to the exclusion of coal from all other countries.

Mexico guarantees that the income of the company shall not be less than $1,250,000 a year for fifteen years, provided that our country, or some European nation, guarantees income to the amount of $2,500,000 more for the same period. In other words, if the income of the company from its business should fall below $3,750,000 per annum, the subscribing governments are to make good the remainder. The time for completing the road has also been extended to 1894. Owing to the encouragement given by President Cleveland, a movement has been started at Washington to obtain favorable action from Congress. Senator Morgan, of Alabama, succeeded in having a resolution adopted calling upon the President for a report on the proposed railway. A large number of people are deeply interested in the enterprise, and some important steps for its advancement will probably be taken during the winter.

A CORRESPONDENT suggests the need of a discovery or invention for preventing trichinæ in hogs, thus putting an end to the losses of life and property which this parasite causes. Here is something for ingenious minds to think of.

Fig. 1.

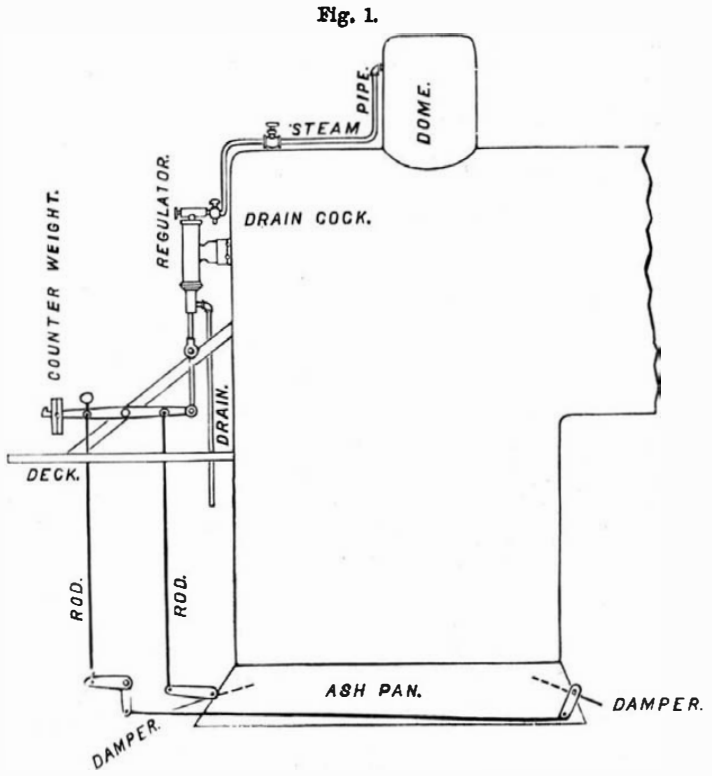
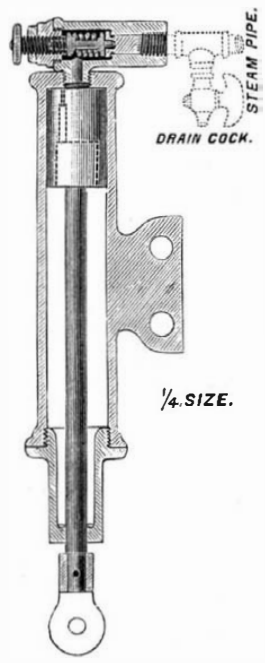


Fig. 2.



McDONALD & TOWNSEND'S AUTOMATIC DAMPER REGULATOR.