

the best bolted flour, you are being victimized—it is either adulterated or it is made from inferior wheat. A common form of adulteration, and one that is practiced by at least one retail flour dealer in this city, is to take a barrel of flour costing about five dollars, add to it about sixty pounds of bran, twenty-five pounds middlings, and the same quantity of corn meal. The result of the mixture is three hundred and six pounds of stuff costing about six dollars and forty-five cents, or a fraction over two cents a pound; while Graham flour, made from the best wheat, cannot be sold now at less than three and one half to four cents a pound. And yet this vile stuff is being swallowed by people in search of better health, when they would do about as well on a diet of hot white biscuit.—*St. Louis Trade Journal.*

How the Capitol at Albany, N. Y., is to be Warmed and Ventilated.

The contract for heating and ventilating the Capitol building at Albany has been given to F. Tudor & Co., ventilating engineers, of Boston, Mass.

The space to be provided for is 300 by 400 feet, 100 feet high, and the cost of the system is to be about \$30,000. The engineer in the basement will have entire control of the atmosphere of the building, and will be supplied with indicators showing the temperature of every room in the edifice, and in the case of the two large assembly rooms the temperature of different parts of the rooms. After being drawn over the boilers by two 8 foot 3 ton exhaust fans, the air supply passes through two steam coils having a surface of 10,000 square feet each. Thence it goes to a chamber where it is mixed with cold air until the requisite temperature is attained, when it is caught into the blowers for distribution through large zinc tubes. By a movement of the damper determining the flow of hot and cold air to the mixing chamber, an even temperature will be secured. The system will be operated by six 54 horse power steel boilers, built by Hodge, of East Boston, with a 35 horse power Buckeye condensing engine to work the fans. The engine will have a 14 inch cylinder, 28 inch stroke, and will run at 15 pounds pressure. As an offset to the cooling surfaces of the many 5 by 15 windows, pipes are run behind the mopboards, and will throw up from regular vents radiations from live steam.

What a Perfect Railway Brake Should Do.

The series of experiments with continuous railway brakes lately conducted by Capt. Douglas Galton, on the Brighton (Eng.) Railway, resulted in the establishment of definite conclusions upon several points of practice hitherto in dispute. The conditions of the greatest efficiency in a brake he finds to be few in number. A perfect brake must be capable of instantaneous application with all the force which it can exert, the blocks closing upon the wheels in immediate response to the turning of an easily moving handle by the driver. For trains at high speed—that is, for the ordinary express rates of fifty or sixty miles an hour—the force thus instantaneously exerted must amount to quite double the pressure of the wheels upon the rails. The greatest retardation is produced when the wheels are revolving, but at a rate less than that which would correspond with the rate of movement of the train; and as soon as the wheels are skidded the train glides onward with diminished resistance, and, therefore, goes further than it would have done if they had continued slowly to revolve. Hence it follows that skidding must be prevented; and the difficulty of doing this depends upon the fact that the wheels are skidded more and more easily as their speed of rotation diminishes, so that, with any considerable pressure, ultimate skidding is a matter of certainty. Hence it has been found that the pressure ought to be diminished in the same ratio as the speed, so that the wheels may always be under the dominion of a force sufficient to restrain their motion, but not sufficient to arrest it. It is only by a combination of high initial pressure with a device for steadily reducing it that stoppage within the shortest possible distance can be obtained; and it is manifest that distance, and not time, is the condition by which the efficiency of a brake must be measured. A brake which will stop a train in fifteen seconds, and in one hundred yards, is far better, considered as a source of safety against collisions, than one which will stop the train in ten seconds, but will allow it in that time to run one hundred and fifty yards. If we conceive the obstacle to be one hundred yards from the point at which the brake was applied by the driver, the superiority of the distance to the time standard becomes plainly manifest.

The Secret of It.

At the American Institute Fair an inventor distributes a circular descriptive of a "noiseless rail," in which it is stated that "the wire filled rails have the advantage on raised ground, where the rail road going up, have no difficulty, on account the crevices in the wire are filled with sand and dust by nature on account to be exposed, if the wheels are dovetailed the same way, like the rails, combined together, they will make no noise at all." The inventor further states that a dovetailed groove "filled with pasteboard, rubber, leather, lead, or soft tough steel wire, pressed or hammered in, on the top, on any matter of non-conducting noise will take away the rattling noise." If any one doubts the proposition, we suggest that he test it experimentally.

Florida Ship Canal.

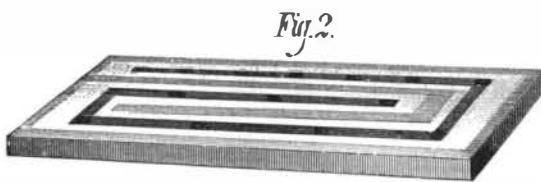
Among the most recent of the many plans suggested by the constantly growing need of the Mississippi valley and the farther West for cheaper transportation of their products to the Atlantic seaboard, is the revival of the old plan of building a ship canal across the State of Florida, or rather across the peninsula of Matanzas Inlet, on the Atlantic, to Fort Wool or Clay Landing, on the Suwanee river. It is claimed that not more than seventy-five miles of canal would have to be cut on this route, that it would have an excellent harbor at each end, and that the whole route would be well supplied with natural feeders. It would make the distance between New Orleans and New York from 1,000 to 1,200 miles less than the track now sailed over, and would, it is claimed, save, yearly, \$5,000,000, in the way of shipwrecks, and \$3,000,000, annually, in the way of extra insurance; over \$40,000,000 in freight, and several millions every year in the way of grain and other products which go to waste in the Mississippi valley for want of cheaper transportation.

The canal, when built, would, it is calculated, bring in an annual revenue of from \$8,000,000 to \$10,000,000, and much more when the Darien Canal is completed, as it would throw a vast amount of shipping from California, Japan, and China through the Gulf of Mexico and through the Florida Canal to New York, Liverpool and other ports.

The connection of the Pacific and the Gulf by canal would render this project worthy of further consideration.

A NEW RHEOSTAT.

Last May I invented a new rheostat, which can be used for the Faradic as well as the continuous current. It recom-

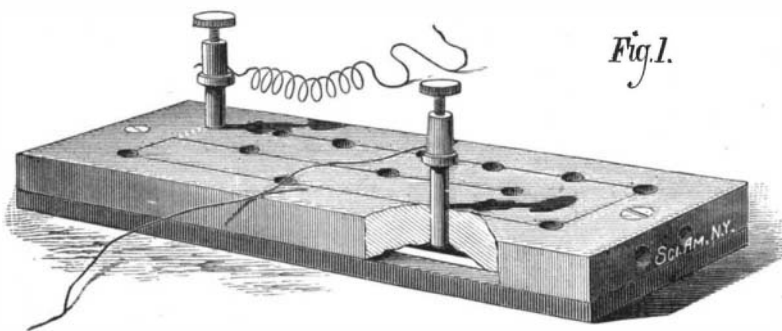


LOWER HALF OF RHEOSTAT.

ommends itself for simplicity, durability, and cheapness. A line of plumbago of variable length is the only means for the resistance.

For the construction of the instrument the following few articles are required: A small quantity of plumbago, a piece of paper, two binding screws terminating in a wire of one inch length and $\frac{3}{8}$ inch thickness, two boards 6 by $2\frac{1}{2}$, one of them $\frac{1}{2}$ inch, the other $\frac{1}{4}$ inch thick, two common screws, and shellac varnish.

To make the rheostat: Lay out the thicker board, as shown in Fig. 1. The upper line should be $4\frac{1}{2}$ inches long, the others proportionally; this should be divided into six equal parts, and the remaining four lines into seven; each section of the latter being double the length of one of the former. Bore holes through the board on the dividing points indicated, large enough for the end of the binding screws to fit easily, not loosely. Glue a piece of writing paper on the thinner board, adjust the perforated board over it, and press with the wire end of the binding screw slight impressions on the paper through the holes. Cover the end of a small stick or match stump with a strip of soft leather $\frac{1}{8}$ inch wide, moisten it slightly, dip it in the best powdered plumbago (stove blacking), and connect the marks on the paper by a line of the blacking, as indicated in Fig. 2. Pass over the lines several times with the plumbago, so as to make a dark, continuous, smooth line of about $\frac{1}{8}$ inch in width. Blow off all loose particles. Shellac all parts ex-



DR. OEHME'S RHEOSTAT.

cept the black lines, and screw the thin board on the thick one. The rheostat is now completed. When not in use, it should be kept face downward to prevent dust from entering.

This rheostat has over 20,000 ohms resistance, but if the black line should be made broader, it would, of course, offer less resistance, and *vice versa*. F. G. OEHME, M. D. Tompkinsville, Staten Island, N. Y.

Additions to Our List of Food Fish.

The work of the United States Fish Commission during the past season has been eminently successful, from a practical as well as a scientific point of view. One of the great advantages derived from making Gloucester, Mass., the headquarters of the commission, arose from the interest awakened among the fishermen of that port. Thanks largely to their collections there have been added to the fauna of the United States, within the last twelve months, by the

commission, no less than 19 species, all coming from the vicinity of Cape Ann. Perhaps, during the last fifty years, there has not been made such a large addition to science. Of these, five have been described by Messrs. Goode and Bean as quite new, namely, the *Macrurus Bairdi*, *Lycodes Verilli*, *Haloporphyrus viola*, *Phycis Chesteri*, and *Chimera plumbia*, with some others, not yet classed or described. There are 14 forms which occur on the coast of Greenland, Northern Europe, or in the deep seas off Madeira, and in the Central Atlantic, which have been taken in the waters near and around Cape Ann. To better understand the scope of the work done, it may be stated that the investigations of the Fish Commission have doubled the catalogue of fish, as printed in the standard book of Massachusetts, published as late as 1868.

The addition of the beam and trawl to the apparatus of American fishermen has resulted in the important discovery of two fish which promise to add largely to the food supply of the country. One of these, the craig or pole flounder (*Glyptocephalus cynoglossus*), an excellent table fish, may now be caught in great abundance in certain depths of water, where its presence was before never even suspected by the fishermen. The black turbot (*Reinhardtius pinguis*), the only substitute for the English turbot we have in North American waters, has been found to exist on the outer slopes of the banks north of the Georges. It was believed, before the commission worked out this fact, that the black turbot was never caught south of Newfoundland, and then only in winter. It now is quite certain that this excellent fish can be captured the whole season round in American waters.

New Mechanical Inventions.

Mr. John F. Seymour, of New York city, has patented an improved Attachment for Printing Presses for gumming the backs of sheets of postage stamps, revenue stamps, etc., to lessen the labor and cost of manufacturing stamps. It is effective and will do its work rapidly and well.

Mr. John B. Candy, of Trenton, N. J., has patented an improved Attachment to Lathes for Cutting Rubber and other Rings. This invention consists in the employment, in connection with a lathe, of a ratchet and pawl operated by the motion of the tool rest, whereby the slide that carries the tool rest is caused to travel the exact distance required after each cut. The attachment is provided with means for adjusting the connections to the ratchet and pawl mechanism, whereby the distance traveled by the slide, and consequently the width of the rings cut off, is regulated.

Messrs. James B. Winchell and Joseph W. Häuser, of St. Joseph, Mich., have patented an improved Vehicle Sand Band, consisting of a cap attached to the inner end of the hub, and having two flanges, of which the outer flange has an annular seat for receiving a collar section of the axle, having circumferential rim, flange, and smaller collar, so as to form an intimate contact joint of cap and axle collar.

Mr. Joseph A. Hodel, of Cumberland, Md., has patented an improved Apparatus for Forming Valve Yokes for Steam Engines. In manufacturing these yokes heretofore their weight had to be sustained by the workman while manipulating the same into its perfect form, and as the valve yoke of the locomotive engine ordinarily used weighs about eighty pounds, the operations of forging and welding involved much hard labor. This invention consists in a device for forming these yokes accurately and without laborious handling.

Mr. Eric O. Leermo, of Gold Hill, Nev., has patented an improved Suction Pipe, provided with a number of short branch or T pipes at intervals along its length, which is used in connection with a socket head that supports the pipe, so that any one of said branches may connect with the pipe from the pump, according to the length desired, and the suction pipe may be swung on said connection or disconnected and raised when blasting is to be done.

An improvement in Steam or Air Brakes has been patented by Mr. Marshall Wood, of Alderson, W. Va. The object of this invention is to furnish an improved mechanism for connecting the brakes of the several cars of a train, so that all the brakes may be applied at the same time by the engineer while in his place upon the engine. It is quite simple in construction.

An improved Bit Brace has been patented by Mr. Edward C. Merryman, of Monkton, Md. The object of this invention is to construct a bit brace that may be used for turning bits, taps, and similar tools, and may also be used as a wrench for turning nuts.

Mr. Auguste Beyer, of Paris, France, has patented an improved Machine for Grinding and Mixing Soap, Chocolate, and other pasty substances, in which revolving rolls, having different velocities and disposed so as to convey the pasty mass simultaneously with the grinding and mixing either back in the feed hopper or into an adjacent machine of similar construction, or into a machine for compressing and moulding the mass, the improved machine saving the time and labor hitherto required in common mixing machines for conveying the mass either into the hopper of the same machine for a second passage or to the next machine.

Mr. John T. Fry, of Brooklyn, Iowa, has patented an improved Rotary Churn. It has a hollow cone dasher provided with wings or buckets, also a dasher shaft and suitable driving mechanism.