

STEAM ENGINE GOVERNOR.

The accompanying engraving represents a steam engine governor with an automatic safety stop, applicable to both stationary and portable engines. It can be placed on a motor in either a vertical or horizontal position. The theory embodied in its construction is to relieve the joints of the ball arms or levers from friction, and also the weight of the ball; to have the balls always revolve in the same plane, without rising or falling, the force usually supplied by gravity being furnished by springs, which also sustain the weight of the balls. The valve is of much larger area than is usual in ball governors, the object being to insure the highest economy consistent with the use of plain engines, and also the nearest to perfection in regulating. The use of comparatively light balls, springs, and a medium high speed, all tend to correct results in regulation, especially if combined with large valves.

The governor is supported on a frame of novel design, which also closes the opening in the upper end of the valve chamber. The peculiar shape of this frame admits of easy access to the stuffing box, bolts, etc., even in the smallest sizes. Into this frame is fastened by a set screw a stud, which supports the casting composing the governor proper, and which is made to revolve around the stud. This casting is provided at the top with proper ears to receive the joints of the arms which revolve with it, and at the lower end with two projections, to which are bolted one end of a steel spring. The free end of this spring is formed into a slot, and also of such shape as to receive the ball, which is secured to the spring by bolts. One end of the arm is formed into a small ball, and fits loosely into the slot of the spring; the other end of the arm carries a piece of hardened steel, which works in a grooved composition collar, fitted to move up and down in the central stud. The valve-stem is screwed through this collar and communicates motion directly to the valve. The balls being supported and rotated by the springs, all friction is taken off the joints of arms, and the balls do not rise and fall by the rotation of the arm around its pivot, the slot in the spring compensating for all difference in motion. The end of the valve stem is extended through the top of the composition collar, and furnished with a handle with which to turn it, and a check nut to hold it in place. Screwing this stem down causes the engine to run slower; screwing it up causes it to run faster. The check nut holds it wherever wanted. The bearing of the horizontal shaft is bolted to the frame, and if broken off by accident, can be easily and cheaply replaced without damage to other parts of the governor. All bearings are made of Babbitt metal, and all parts are duplicate.

This governor is claimed by the manufacturers to be especially adapted to very small engines, as it is quick in its action; for this reason it is also a valuable one for steam engines in saw, flour, and rolling mills, and in all manufactories where the changes in the operation of the machinery are severe and sudden. The automatic safety stop, not seen in the engraving, consists of an arrangement which is simple, efficient and not liable to derangement. The revolving head of the governor is supported by a disk operating upon the edge of another disk of the same diameter, which is secured to the driving or horizontal shaft of the governor. The bearing of this shaft is held at one end in a forked lever by centers, and at the other by a shell or casing having a rib or projection on its interior surface. A like rib on the outside of the bearing prevents the weight on the end of the forked lever from dropping so long as the tension of the driving belt holds the ribs in contact. The instant the belt gives way the weighted lever falls, carrying the bearing outward, so as to disengage the gears and the supporting disks, when the revolving head immediately drops by its own weight, bearing with it the valve stem and valve, and instantly closing off the passage of steam to the engine.

This governor is in extensive use in this country and abroad. Further information may be had on application to the manufacturers, C. Waters & Co., Boston, Mass.

Aluminum and Platinum in the Manufacture of Watches.

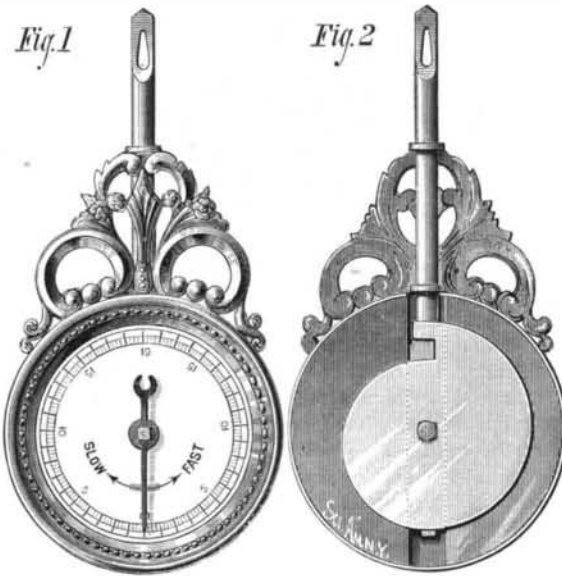
In ordinary watches their correctness depends greatly on their position, whether this be a vertical or horizontal one. The reason is that the more rapidly rotating wheels principally, but more or less all of them, are made of too heavy material. Brass, or a similar composition, is, as a rule, too heavy, and, as an immediate consequence, it will not be immaterial whether a wheel presses with its full weight vertically upon the axis (that is, rests on the point of it), or whether the pressure of its weight is exerted on the circumference of the axis. The latter is naturally the more correct position, insuring a correct, even, and unchanged movement of the watch. Hence the steady desire to keep the watch in an upright position. Much less felt will be the influence of changed position, especially of that of the more rapidly rotating wheels, if these are made

of the thrice lighter aluminum instead of brass. Used for that purpose aluminum constitutes an important improvement, since the position then becomes a matter of no influence on the movement of the watch. The friction, and therefore the wear of the wheels, are reduced, and oiling may often be dispensed with.

Platinum, however, by its heaviness, is indicated for the manufacture of balances, as they become thereby more independent of exterior shocks.—G. F. Reisenbichler, in *Schweizer. Gewerbe-Blatt.*

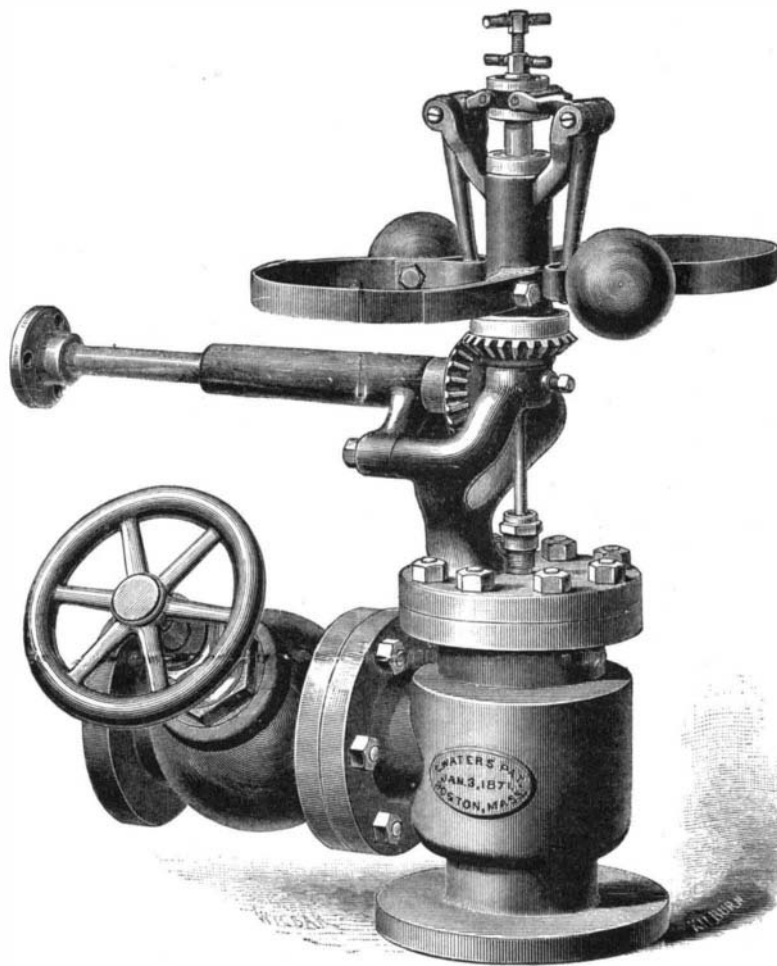
NEW REGULATING ATTACHMENT FOR CLOCK PENDULUMS.

We illustrate herewith, in two figures, a novel and ingenious device for regulating clock pendulums, recently



JACOT'S REGULATOR.

patented by Mr. H. C. Jacot, of St. Louis, Mo. An arbor passes through the center of the pendulum ball, and is squared at each end to receive at the front an index, as shown in Fig. 1, and at the back a cam, which engages a lug on the extreme lower end of the pendulum rod, Fig. 2. The index moves over a small dial, which is graduated so that each number corresponds to one minute per day, so



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that by turning the index in one direction, the pendulum ball is lowered and the movement of the clock is retarded; by turning it in the opposite direction, the ball is raised and the movement accelerated. The key that is used for winding the clock is adapted to the regulator. This regulator is not only very useful, making the adjustment of the pendulum simple and positive, but it also adds greatly to the appearance of the clock, being itself an ornamental object.

Further information may be obtained by addressing the inventor, care of Messrs. Eugene Jaccard & Co., 300 North Fifth street, St. Louis, Mo.

Phosphorescent Time Pieces.

Some time ago it was reported that watches were being made in Switzerland with phosphorescent dials, so that the hour could be ascertained from them at any time of night without the aid of artificial light. Recently an Eastern clock company has been manufacturing clocks with this same kind of self-illuminating faces, and they have been on exhibition in the windows of several of our city stores.

M. Olivier Mathey, a Neufchâtel chemist, communicates the following information in regard to the composition of these dials to one of our French exchanges:

Phosphorescent dials are usually made of paper or thin cardboard, enameled like visiting cards; they are covered with an adhesive varnish, or with white wax mixed with a little turpentine, upon which is dusted, with a fine sieve, powdered sulphide of barium—a salt which retains its phosphorescence for some little time. The sulphides of strontium and calcium possess the same property, but lose it more quickly than the former. After the dial has remained in darkness some days it loses its phosphorescence; but this may be readily restored by exposure of an hour to sunlight, or, better still, by burning near the dial a few inches of magnesium wire, which gives forth numerous chemical rays.

Bee Culture in Egypt.

The Egyptians exhibit great skill in their manner of cultivating the bee. The flowers and the harvest are much earlier in upper Egypt than in lower, and the inhabitants profit by this circumstance in regard to their bees. They collect the hives of different villages on large barks, and every proprietor attaches a particular mark to his hive; when the boat is loaded, the conductors descend the river slowly, stopping at all places where they can find pasturage for the bees.

After having thus spent three months on the Nile, the hives are returned to the proprietor, and after deducting a small sum due to the boatman for having conducted his hives from one end of Egypt to the other, he finds himself on a sudden enriched with a quantity of honey and wax, which is immediately sent to the market. This species of industry procures for the Egyptians an abundance of wax and honey, which they export in large quantities to foreign countries.

New Mechanical Inventions.

Mr. Joseph Hackett, of Louisville, Ky., has patented an improved Moulding Machine for light castings, by which the moulds may be made quicker and better than by hand.

Mr. Frank A. Buell, of Brooklyn (E. D.), N. Y., has patented an improved Saw Set, having a forked shank adjusted by a bolt, and provided with arms having gauge screws for limiting the set of the tooth.

An improvement in Insulating Railroad Tracks has been patented by Mr. Louis Basset, of Brooklyn, N. Y. The object of this invention is to insulate the rails of railroads from the structure upon which they rest, so that the vibrations caused by passing trains will not be communicated to the supporting structure, so as to be diffused.

Mr. Francis J. Hanna, of Kane City, Pa., has patented an improved Oil Well Pump, having a tubular piston, open at each end, and provided with a ball valve at the top, and connected by a centrally open coupling with tubular piston rod, the whole being arranged to operate in a pump barrel that is perforated at its upper end.

An improved Locomotive has been patented by Mr. Jacob J. Anthony, of Sharon Springs, N. Y. It consists in a rectangular water tank, adapted to receive the locomotive boiler, and constructed with a recess to receive the cranks and connecting rods of the locomotive.

Mr. Seth Kethledge, of Center Point, Iowa, has patented an improved Lumber Measure, in which the motion of the spur wheel or toothed disks is transmitted to an indicator which has a reciprocating rectilinear motion longitudinally of the carrying frame or case. No adjustment is required for the purpose of measuring boards of different widths. Instead of a circular dial there is a scale marked with figures arranged in columns extending longitudinally on the surface of the carrying frame or case, and a separate column is provided for each of the different standard lengths of lumber.

Mr. Thomas N. Jordan, of Mobile, Alabama, has patented an improved Machine for Holding and Guiding the File in saw filing, so that a saw may be filed with accuracy and dispatch, even if the operator is unskilled.

The experiment with 5½ foot driving wheels, on the New York division of the Pennsylvania Railroad, after some improvements had been made, is said to be entirely successful. A great advantage is gained in draught and speed, and the trains using them have no difficulty in making the distance between Philadelphia and New York in two hours.