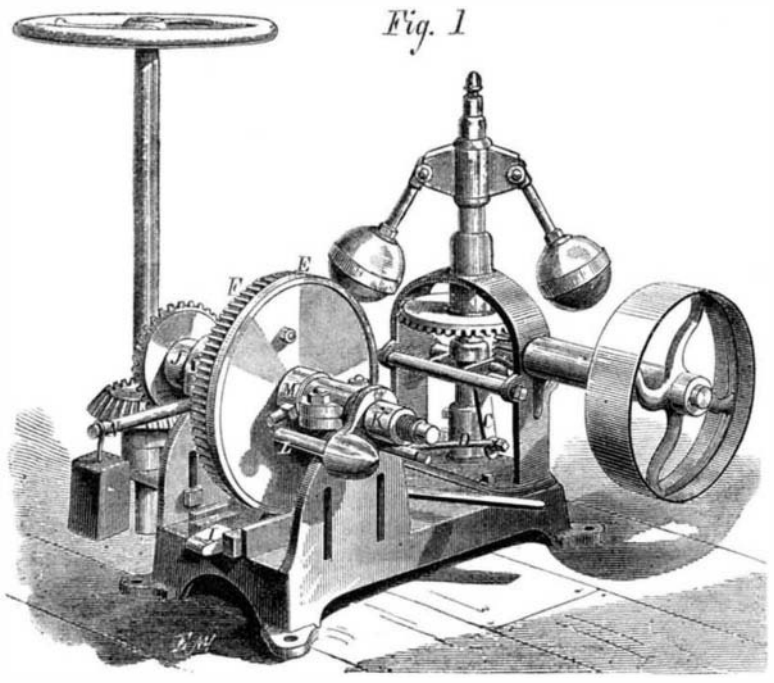
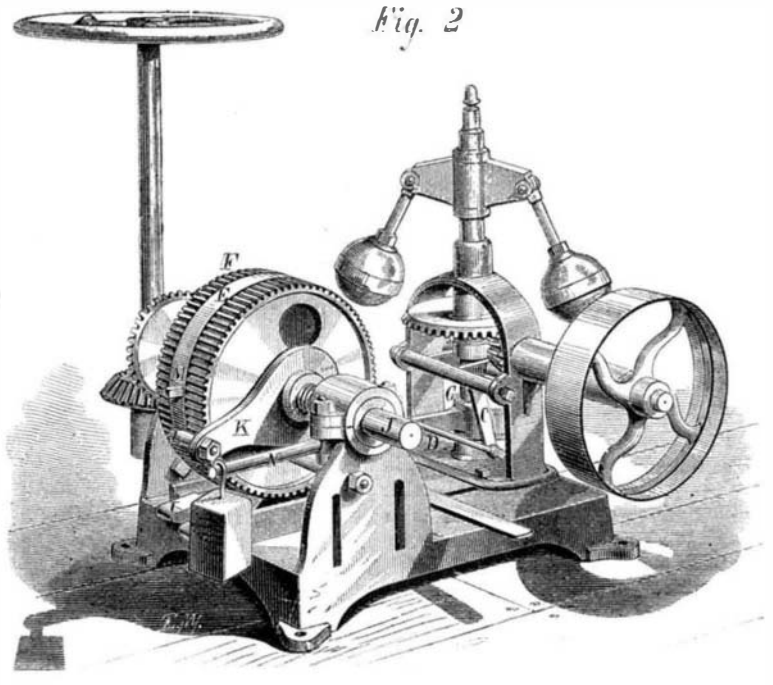
IMPROVED WATERR WHEEL GOVERNOR.

The water wheel governor herewith illustrated is one which has been in practical use for some years, meeting with a wide-spread success. It has, however, been made the subject, from time to time, of various modifications, tending to simplify its form and add to its strength and general efficiency. The engravings, Figs. 1 and 2, represent the invention in two different forms, in both of which the manufacturer has combined the latest improvements.

The mechanism will be understood from the sectional view, Fig. 3, in which A is a vertical shaft, which, driven by a pulley shaft and bevel gearing, revolves the balls. The latter actuate the collar, B, in the ordinary way, and the collar in turn works the bell crank, C. To the bell crank is pivoted the connecting rod, D, which is similarly connected with the shield, E. This last is either a disk or a sector toothed wheel, F, and is provided in either case with a notch at the bottom, as shown in Fig. 3.

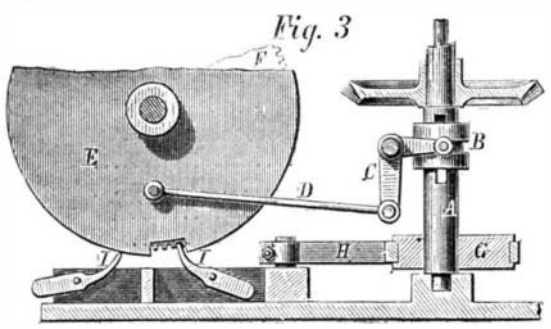




WALSH'S CHAMPION WATER WHEEL GOVERNOR.

With each revolution of shaft, A, an eccentric, G, through the rod, H, reciprocates the gravity pawls, I, one or the other of which engages the toothed wheel, F, according as the notch in the rim of the shield permits the engagement. As the collar, B, moves up and down with variations of speed, the shield is moved, by the connecting rod, D, above described, so that the notch in the shield allows of the action of the proper shaft. The toothed wheel, F, is fixed to the shaft, J, which is connected to the gate shaft by bevel gearing.

It is obvious that, when the notch in the shield stands mid-way between the pawls, I, neither of the pawls can act. Advantage is taken of this to limit the hight to which the gate can be raised by the governor. A nut and arm, K, run in a thread cut on the shaft, J, Fig. 1. The arm carries a pin, L. By the continued action of the pawl that raises the gate, the nut, K, is run along the thread on J, till it finally abuts against a shoulder turned on the shaft, and then turns with the shaft. At the same time the pin, L, is brought under a lug, M, formed on the hub of the shield. The shield is thus turned so as to bring the notch to the center, where, as neither of the pawls can act, the gate cannot be further



raised. As soon as the speed of the general shafting, to which the governor is belted, increases, the action of the collar, B, and bell crank, C, Fig. 3, moves the notch of the center so that the proper pawl to lower the gate acts as before.

Fig. 2 represents a governor made to act by two eccentrics, two systems of pawls, and two toothed wheels, so as to raise or lower the gate faster than the single system will: this style of governor being designed for certain turbines, the gates of which are operated with screws which require many turns to open or close the gate.

A friction brake, N, Fig. 1, is employed to hold the shaft, J, from turning back, as it will in some cases during the intervals between the impulses imparted by the pawls.

There is little to be added relative to this invention other than to note the fact that over 500 are now in use. It possesses the important advantages of simplicity and durability, and, according to the manufacturer, it is adapted to meet the requirements of all kinds of wheels under every circumstance.

Further particulars may be obtained by addressing Mr. A. Walsh, Cambridge, New York.

Recent Researches in Artificial Light for Photography.

We recently adverted to a new and brilliant light, said to be utilizable for photographic purposes, and based on the employment of binoxide of nitrogen and sulphide of carbon. MM. Riche and Bardy have recently conducted a series of experiments upon this and other modes of illumination, with a view of determining whether it was the carbon or the sulphur which gave to the light its photogenic properties, and as to whether it were possible to construct a lamp simpler in form and free from the danger of explosion incident to the use of the gases above named. The result of their investigations shows the following comparative statement of photogenic power: Oxyhydric and Drummond light, 1; zinc burning in oxygen, 4; magnesium lamp, 5; binoxide of nitrogen without sulphide of carbon, 6, and a jet of oxygen delivered upon sulphur, 8. From this it appears that the mixture of binoxide of nitrogen and sulphide of carbon is useless, since the simpler light last mentioned is more advantageous. The fumes of sulphurous acid arising from the latter are easily conducted away by a bell placed above the flame, communicating with the chimney of the apartment and so producing an upward draft.

Useful Recipes for the Shop, the Household, and the Farm.

A simple method of determining the quantity of cream in any sample of milk consists in agitating the milk in a graduated glass tube with its bulk of ether for four or five minutes. Add alcohol in volume equal to that of the milk, and shake for five minutes. Place the tube vertically and allow it to rest for a brief period, when the oily matter will rise to the surface so that its amount may be read off on the scale and the percentage easily computed.

A good varnish for maps is made of 1 ounce Canada balsam and 2 ounces spirits of turpentine. This is laid on with a soft brush, over a thin coating of isinglass previously dried.

To remove the stains on spoons caused by using them for boiled eggs, rub with common salt.

Oak timber loses about one fifth of its weight in seasoning, and about one third of its weight in becoming perfectly dry.

To disinfect moldy casks, first wash for about five minutes with an alkaline solution of soda, and then soak for one or two days with a liquor acidulated with hydrochloric acid.

A wound made by a knife or other sharp instrument is best healed by bringing the edges together and putting on a bandage which will not exclude the air. Nature will work the cure, if the person be healthy, much better than any salve or ointment.

A good transfer paper for copying monumental inscrip tions and metallic patterns may be made by rubbing a mixture of black lead and soap over the surface of common silver paper.

An ox will consume two per cent of his weight of hay per day to maintain his condition. If put to moderate labor, an increase of this quantity to three per cent will enable him to perform his work and still maintain his flesh. If he is to be fatted, he requires about four and a half per cent of his weight daily in nutritious food.

The strongest side of a piece of timber is that which in its natural position faced the north.

A good zinc wash for rooms is made of oxide of zinc mixed with common size, and applied like whitewash. After it is dry, put on a wash of chloride of zinc, which will produce a glossy surface.

Too great care of the health at this period of the year cannot be exercised. Because a few days are open, bright, and warm, all the windows in the house should not be thrown open, the fires put out, or flannels thrown aside. It is better to err on the safe side, and endure the trifling discomfort, than, by free exposure, to invite pneumonia and other diseases common during the damp weather of a late spring.

To make liquid glue, dissolve 53 parts of best glue on the steam bath in a porcelain vessel, in 36 parts of water. Then add gradually, stirring constantly, 3 parts of aqua fortis, or enough to prevent the glue hardening when cool.

A New Fat and a New Source of Borax.

In the course of a new work recently written by Mr. Arthur Robottom, of Birmingham, Eng., entitled "A Visit to Strange Countries in Search of New Products," the author describes the curious "mutton birds" of the Pacific coast and islands. These birds burrow in the ground like rabbits, and are remarkable for their fat, which, the writer thinks, might be rendered available for lubricating purposes, inasmuch as it has a viscosity approaching to that of the oil which is found in the head of the spermaceti whale. The present scarcity, and high value of sperm oil give great importance to any kind of oil or fat which can take its place for the lubrication of cotton spindles and like motions; and hence it is believed that the fat of the mutton bird should be carefully tested for that purpose.

The same author mentions a cañon in Southern California, which leads the traveler to the bed of an ancient lake. On this bed is a marvelous deposit of borax, several feet in depth. The salt is found in huge crystals, some as large as a man's fist, and is of remarkable purity. The locality is known as Death's Valley, and some of the borax gathered there has already found its way to the markets. A greater export would be made if the road between the deposit and the coast offered better facilities for transportation.

IMPROVED MEAT TENDERER.

We illustrate herewith a handy device for rendering tough meat tender, intended as a substitute for the usual practice of pounding. The tool consists simply of an assemblage of sharpened steel blades, which are inserted in a metal socket and held apart by pieces of wood, the whole being confined by a set screw at the end of the supporting rod, so that the blades are easily removable for sharpening.

The mode of operating the invention is by drawing the cutting edge over the surface of the meat in various directions until the stringy portions are thoroughly divided, the device being held by a suitable handle, as represented in the engraving.

For further particulars address the Desper Manufacturing Company, Barre, Mass. (See advertisement which appears on on another page).

New versus Old Seeds.

Persons, in ordering their seeds for spring planting, should be sure to obtain them of reliable seed dealers. Seed will not germinate if they are too old; and disappointment and delay often result. Experience of seedsmen indicates that, if properly gathered and preserved, beans will retain vitality 2 years; beet, 7: cabbage, 4; carrot, 2; sweet corn, 2; cucumber, 10; lettuce, 3; melon, 10; onion, 1; parsnip 1; peas, 2; radish, 3; squash, 10; tomato, 7; turnip, 4.