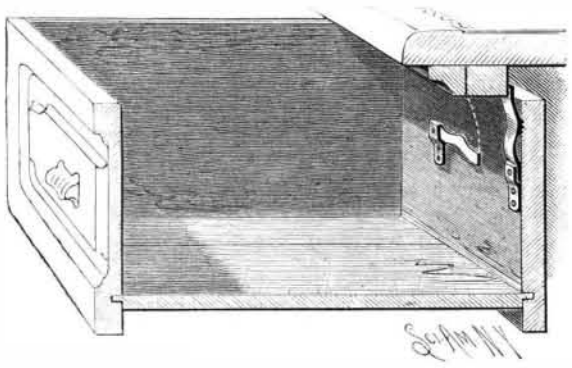
AN IMPROVED DRAWER STOP.

A simple device readily applicable to drawers of any size to prevent their being entirely withdrawn from the casing, and which may be conveniently manipulated to permit their complete withdrawal when so desired, is shown in the illustration, and has been patented by Mr. Samuel H. Levy, of No. 235 Oak Street, Chicago, Ill. The device is preferably constructed in two sec-



LEVY'S DRAWER STOP.

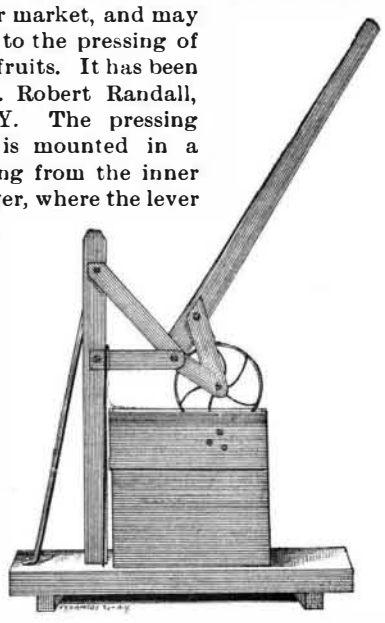
tions, one of which is in the form of a bracket to be attached to the drawer, while the other, or the stop proper, is a strip of spring metal bent in the form of a compound curve, and pivoted to the bracket, the stop thus pivoted having teeth or spurs to engage the back of the drawer. The bracket, however, may be dispensed with if desired, when the stop itself is pivoted directly to the drawer by passing a screw through the aperture in its shank end.

Tunnel Building.

The art of tunneling may be considered as having been reduced to a science, as no distance is too great and no material too hard to be penetrated if the object sought is sufficient to justify the expense. The building of the St. Clair River tunnel, where iron cylinders were forced through the clay by hydraulic pressure, was a great advance in the art of building tunnels through certain kinds of soil. The tunnel built under the streets of London, where the top of the arch is just below the cobble stone pavement, was built without in the least obstructing travel at the place where the work was being carried on. According to the *Industrial World*, a tunnel 5 miles long is now being driven through the solid rock under Gray's Peak, 60 miles west of Denver, Col. This tunnel, which is 8×18 feet, is being built primarily to tap the mineral veins in the mountains, which are thought to be quite rich. After the tunnel is complete it will be enlarged and opened for railroad traffic to accommodate an extension of the Utah Central railway, which is to form a through line from Denver to Salt Lake. Thus far about a mile of the tunnel has been driven by hand power, but a plant of ten Rand drills, with Ingersoll air compressors, has just been put in, and an electric light plant is soon to follow, after which it is expected the rate of working will be greatly increased. The excavating of this tunnel is through rock about as hard as any that can be found anywhere.

A CONVENIENT FRUIT PACKING PRESS.

The press shown herewith is designed to be operated by hand for pressing dried fruits, etc., in a case when packing them for market, and may also be adapted to the pressing of juices from fresh fruits. It has been patented by Mr. Robert Randall, of Newark, N. Y. The pressing roller or wheel is mounted in a bracket depending from the inner end of a hand lever, where the lever is also fulcrumed in a bracket upon an upright. The box or package to be filled is surmounted by a removable frame, with depending flanges holding it fairly on the box and constituting a hopper. Any ordinary platen or follower is placed on the fruit or substance in the hopper, and receives the pressure of the lever roller as the fruit is forced down. The device is constructed to weigh only about seventy pounds, so that it can be readily moved about a warehouse or other place where it is used.



RANDALL'S FRUIT PRESS.

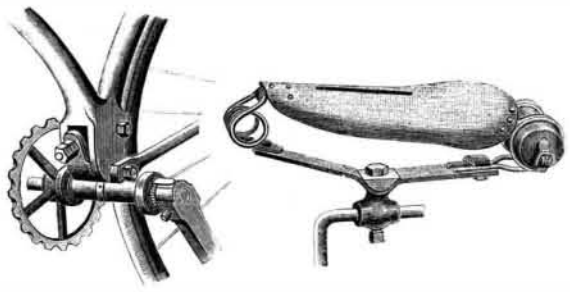
DIAMONDS IN DEMERARA.—Recent reports state that diamond mines of a richly paying character have been found in the interior of Demerara.

THE LOVELL DIAMOND SAFETY BICYCLE.

The success of this bicycle last year has led the manufacturers to make additional improvements, two of which we show in the accompanying cuts. The improved chain adjustment used on this Lovell safety is of a superior character. The bracket, which is steel drop forged, contains crank shaft and ball bearings and swings on a separate steel axle that has a long parallel bearing between a heavy forked shape section in the frame, which is brazed solidly to the frame and is a permanent fixture. The motion of the bracket is fore and aft, in the solid section of the frame, there being no lateral motion. This bracket is adjusted by a nickel rod with nut and set nut, being thus held stationary. The saddle is of the hammock suspension kind, with springs both fore and aft. A new adjustment for tipping the saddle has been added this season, which is shown in the cut. The saddle cantel has two small rivets which fit in holes in the tilting plate. By loosening the set screw, the saddle can be instantly fastened at any angle desired. The frame is diamond shape, of cold-drawn steel tubing and steel drop-forged parts. The wheels are 30 inches, with ⅞ inch crescent shaped rims. Each wheel has 40 direct spokes, of number 11 steel wire. The hubs are steel drop forged, and the wheels are designed to stand severe work on country roads. The brake is of the direct plunger pattern, and is very powerful. Ball bearings are fitted to every running part of the machine. As three-fourths of the weight of the rider comes on the rear wheel, the manufacturers have made a separate set of bearing cases,

DIAMOND SAFETY No. 1.

specially designed, bolted in the section of the frame in such manner that no matter what weight or strain is brought on the wheel it does not cramp the bearings or interfere with the ease of running. Particular attention has been given to the finish of this machine, and the enameled parts are all carefully inspected upon leaving the factory. The weight of this safety cycle



CHAIN ADJUSTMENT. ADJUSTMENT FOR TIPPING THE SADDLE.

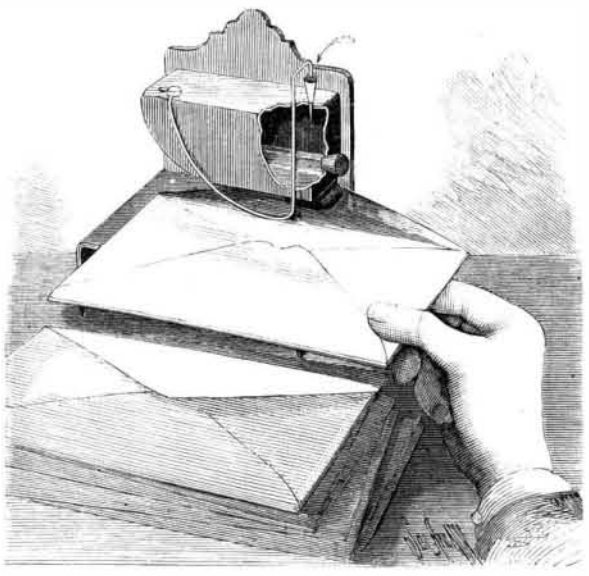
complete is 47 pounds. The manufacturers are the John P. Lovell Arms Company, 149 Washington Street, Boston, Mass., who will send illustrated catalogue on application.

Haulage of Canal Boats by Locomotives.

At a meeting of the Railway Union in Berlin, Herr Wiebe described some experiments recently made on two lengths of the Oder and Spree canal, 3½ miles long in all, with a view to ascertain the best method of towing large boats. The submerged chain system is, he states, unsatisfactory, nor has the endless rope system of traction given entirely saisfactory results when practically tested during the course of the experiments, though a great many types of supporting posts and pulleys were tried. The difficulty encountered arose from the rotation of the rope as it moved onward, which tended to twist the boat painter about the rope, and the form of connection between the rope and the painter could not be depended on to stop this action. Further experiments were then made by attaching the rope to the center of gravity of a heavy towing car, running behind and drawn by a light locomotive such as is commonly used in mines. If the rope is attached directly to the locomotive, trouble may arise from the side pull of the rope tending to overturn the engine. It is for this reason that the towing car was adopted in the experiments in question. This plan is stated to have proved satisfactory, and boats have been towed by it at the rate of 10 ft. to 12 ft. per second (7 to 8 miles per hour), though a speed of 5 ft. (3½ miles per hour) will, in general, be sufficient. The tension on the tow rope in starting three heavy coal barges was as much as 1,764 lb., but rapidly decreased as the boats gathered way.

AN ENVELOPE GUM MOISTENER.

The illustration represents a device for moistening the gum on the open flaps of envelopes and similar articles, patented by Mr. Edward E. Kingsley, of Nos. 25 and 27 Front St., Portland, Oregon. A reservoir with



KINGSLEY'S ENVELOPE MOISTENER.

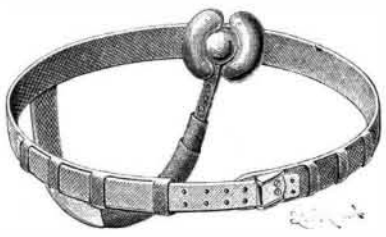
convexed under surface is attached to the vertical member of a frame whose base has pointed feet or spurs, to cause the frame to stay in the position in which it is placed. In one end of the reservoir is an opening through which the water for moistening is introduced, and in the bottom is an aperture in which a sponge or other absorbent substance is inserted, the outer end of the sponge extending slightly downward within an opening in the base member of the frame. In the top of the reservoir at one end is a small conical aperture, normally closed by a plug, attached to which is a spring arm, bent to be carried downward to the base of the frame, thence upward to movable engagement with a button or stud on the other end of the reservoir. When the gummed flap of an envelope is passed under the sponge, the spring arm is slightly lifted, thus raising the plug and allowing air to enter the reservoir, permitting water to flow through the sponge and keep it in a thoroughly moist condition. The immediate return of the plug to its position, by the spring arm, after the envelope has been passed through, prevents further flow of the moistening liquid.

Beating the Egg Tariff.

The *Tombstone Prospector* says: Since the duty on eggs has been the rule many devices have been thought of for manufacturing them. The idea of a Nogales man is, however, the only feasible scheme up to date. His proposition is to feed hens on the cheap grain of Mexico and have them lay in the United States. For this purpose a long building will be placed on the line, half in Mexico and half in the United States. They will feed and water in the Mexican end, and when they want to lay they go to the further end of the building, and in that way escape paying the duty. The projector of this enterprise came from Maine.

BROWNLOW & WARNER'S TRUSS.

In the truss shown in the illustration, a slide upon the belt carries a post which sustains a round compression pad, with an inner bearing face of cork, rubber, or other suitable material, the pad being adjustable to or from the slide. At each side of the central pad are oval side pads, attached by hinging their plate sections to the inner face of the slide at its ends, the two lateral pads being designed to compress, from both sides of the inguinal canal and rings, the tissues adjacent thereto, and to occlude the canal and rings with the natural surrounding tissues, by the combined action of these pads and the independently adjustable center pad. This improvement has been patented by Dr. John H. Brownlow and Joel S. Warner, of Ogdensburg, N. Y.



AN IMPROVED TRUSS.

THE mean of twelve determinations of the coefficient of linear expansion of vulcanite, by Dr. A. M. Mayer (*American Journal of Science*), obtained by means of a specially devised piece of apparatus, gave the value 0·0000636, between the temperature at which the experiments were made, viz., 0° and 18° C. The cubical expansion of the substance is closely represented by the formula $v_t = v_0 + 0{\cdot}000182t + 0{\cdot}00000025t^2$. The specific heat equals 0·33125. The angle of maximum polarization of a polished surface of vulcanite was found to be 57° 29′. Hence the index of refraction equals 1·568.