## 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A simple device readily applicable to drawers of any size to prevent their being entirely withdrawn from the casing, and which may be conveniently manipulated to permit their complete withdrawal when so desired, is shown in the illustration, and has been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 III. 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 desiged, 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 cyl inders were forced through the clay by hydraulic pres sure, 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 $8 \times 18$ 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 o 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 work ing 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 PACRING 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 bracket depending frow the inner end of a hand lever, where the lever is also ful crumed in a bracket upon an upright The box or package to be filled is sur mounted by a removable removable frame, with flanges holding it fairly on the box and consti tuting a hop per. Any ordi nary platen or
 follower is


## RANDALL'S FRUIT PRESS.

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.

Diamonds in Demerara.-Recent reports stat 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 man ufacturers to make additional improvements, two o 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 stee drop forged, contains crank shaft and ball bearing 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 adjust ment for tipping the saddle has been added this sea son, which is shown in the cut. The saddle cantel has two swall rivets which fit in holes in the tilting plate By loosening the set screw, the saddle can be instantly fastened at anv angle desired. The frame is diamond shape, of cold-drawn steel tubing and steel drop-forged parts. The wheels are 30 inches, with $7 / 8$ inch crescent shaped riws. Each wheel has 40 direct spokes, of num ber 11 steel wire. The hubs are steel drop forged, and the wheels are designed to stand severe work on coun try 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 th weight of the rider comes on the rear wheel, the man ufacturers have made a separate set of bearing cases


## DIAMOND SAFETY No. 1.

specially designed, bolted in the section of the fram in such manner that no matter what weight or strain is brought on the wheel it does not cramp the bearing or interfere with the ease of running. Particular at tention 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 $4^{\prime 7}$ 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, $31 / 2$ 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 sys tem 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 $t w i s t$ 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 locomutive such 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 $n$ 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 . ( $31 / 2$ miles per hour) will, in general, be sufficient. The tension on the tow rope in starting three heavy coal barges wa gathered way

## AN ENVELOPE GUM MOISTENER.

The illustration represents a device for moistening egum on the open flaps of envelopes and similar ar cles, patented by Mr. Edward E. Kingsley, of Nos. 2 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 o other absorbent substance is inserted, the outer end o 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 rais the sponge, the spring arm is slightly lifted, thus rais
ing 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 re urn of the plug to its position, by the spring arm, after the envelope has been passed through, prevent further flow of the moistening liquid.

## Beating the Egy Tarifr

The Tombstone Prospector says: Since the duty on eggs has been the rule many devices have been though of for manufacturing them. The idea of a Nogale man is, however, the only feasible scheme up to date His proposition is to feed hens on the cheap grain o 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 wil 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 projec tor 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 com pression pad, with an inner bearing face of cork, rub ber, or other suitable material, the pad being adjust able to or from the slide. At each side of the centra pad are oval side pads, attached by hinging their plate sections to the inner face of the slide at its ends, th wo lateral pads being designed to compress, from both sides of the in guinal canal and rings, the tissues adjacent thereto and to occlude the canal and rings with the natural surround ing tissues, by the combined action of these pads and the independent
y adjustable center pad. This improvement has been patented by Dr. John H. Brownlow and Joel S. War ser, of Ogdensburg, N. Y.

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 pecially devised piece of apparatus, gave the value 0000636 , between the temperature at which the exper ments were made, viz., $0^{\circ}$ and $18^{\circ} \mathrm{C}$. The cubical ex pansion of the substance is closely represented by the forisula $v_{t}=v_{0}+0.000182 t+0.00000025 t^{2}$. The specific heat equals 0.33125 . The angle of maximum polariza tion of a polished surface of vulcanite was found to be $57^{\circ} 20^{\prime}$. Hence the index of refraction equals $1 \cdot 568$.

