

## Natural History Notes.

**Foliation and Defoliation of Plants.**—"Foliation" is the starting forth of leaves, and "defoliation" their natural falling off. "Exfoliation" should properly mean their artificial stripping off, but in English the word has a different signification—the French, however, have a word to express this, derived from the same roots—"effeuillaison." M. De Candolle has undertaken to examine, from certain known data, as well as from observation and experiment, whether there exists any relation between these three facts or phenomena. The following are his conclusions:

1st. On comparing a large number of ligneous species with caducous leaves, no direct and regular ratio can be discovered between the time of foliation and defoliation.

2d. In species where the phenomena of foliation and defoliation sensibly differ between individual and individual, in the same locality and under the same influences, it is sometimes found that the earliest individuals (lindens, for example) in spring are the latest in autumn; but in other species (chestnut and elm, for instance), there is no regular and habitual ratio between these two phenomena: from which it must be concluded that, in spite of exterior resemblance, the interior organization of the leaf is not identical in the individuals of these species.

3d. When one individual differs from others of the same species as regards the time of foliation, this peculiarity shows itself constantly from year to year.

4th. The total stripping (*effeuillaison*) of a ligneous plant in autumn retards the subsequent evolution of the leaves in the spring.

5th. The stripping of a branch in autumn may, or may not, produce the same effect, according to the species or by reason of other circumstances as yet unknown.

6th. The persistence until spring of the dried leaves on certain beech trees agrees with the retardation of the subsequent leafing.

**Moult of the Bill in the Puffin.**—The current number of the *Zoologist* contains an interesting notice of a remarkable discovery made by Dr. Bureau in regard to the moulting of the bill and palpebral appendages in the Common Puffin (*Mormon arctica*). These birds, which are confined to the Arctic regions, on the coasts of America and Europe, assemble in spring for reproduction. They are then all of the same plumage, and wear the same adornments. The cheeks are of a grayish white; the beak elevated, and thick on a level with the nostrils; a plait at the base of the upper mandible; the lower mandible curved regularly; the eyelids vermilion, adorned with two horny plates; a large rosette of a bright yellow at the gape. By the middle of July the young are fledged, and at the middle of August the puffins are out at sea, and not a bird is to be seen on the rocks which up to this time were so full of life. Soon the winds of winter begin to blow, and after some fearful gales hundreds of the dead and dying birds are brought ashore by the waves. The puffins thus cast ashore on the French coast in winter are clad in a plumage different from that worn in the breeding season. In the orbital region they have a spot more or less large, of a dusky brown; they have not the red eyelids, nor the horny plates above and below the eye, nor have they the puckered yellow skin at the base of the bill; and what is still more remarkable, the bill is differently formed; it is neither of the same size, shape, nor color, and the pieces of which it is composed are not even the same. It is small, sliced off in front, wanting the plait at the base, and flattened laterally on a level with the nostrils, where a solid horny skin of a bright lead-color is replaced by a soft grayish membrane. Hitherto authors have considered the puffins found in this state to be the young, of different ages, of *Mormon arctica*; and indeed it has been proposed to separate them specifically under the name of *Mormon grabæ*. However, the discoveries of Dr. Bureau have shown that neither of these views can be admitted. He had for some time been convinced that these different appearances were due to a metamorphosis, and on July 1st, 1877, a specimen was sent him, undergoing the process, thus confirming his suspicions. He lost no time in visiting the breeding places of the birds, at the Ile de l'Océan, where he found them in great abundance. Almost all the specimens shot were in full metamorphosis, changing under his very eyes to what some authors have considered the young of *Mormon arctica* and others the adult of *Mormon grabæ*.

The *Zoologist* reproduces Dr. Bureau's colored plate, where by means of movable pieces the complex phenomenon of this bill moulting is shown. The author observes that the adult bird owes its summer dress to phenomena of three kinds—hypertrophy, formation of horn, and coloration; and loses it under the influence of three inverse phenomena, namely, atrophy, loss of horny substance, and loss of color. He concludes by showing that analogous phenomena occur in the allied species of this bird.

**Comet Forms of Star Fishes.**—In a recent number of the *Zeitsch. wiss. Zool.*, Haeckel draws attention to these forms, and the support which the facts recently established as to the power possessed by certain star fishes of multiplying by throwing off their arms, lends to his theory of the origin of the *Echinoderma* by the continually increasing integration or centralization of a radially-connected colony of worm-like individuals. The phenomenon of self-division across the disk has been observed by Lütken and Konalewsky; the production of "comet-form" depends, however, on the separation of single arms, which then reproduce the whole disk and remaining arms by budding. Martens, in 1866, ob-

served this in the case of a *Luidia* in the Red Sea. Konalewsky found it was a common process with similar species in the same locality. Sars observed it in *Brisinga*. Huder has described the regular occurrence in *Labiaster* of a spontaneous casting off of the arms, but not the regeneration of the disk and arms on the separated arms. Sir John Dalyell observed the whole process of reproduction of the disk on a single detached arm of an *Asteracanthion*.

**The Original of the Cultivated Potato.**—A potato plant (*Solanum Fendleri*) growing in great abundance in northern New Mexico is supposed to be the original of our cultivated potato. This native plant forms one of the chief articles of diet of the Navajo Indians. The squaws dig up the small tubers with whatever implements they can obtain, often using a strong, smooth piece of wood with a wedge-shaped end. The plant grows on low, rich spots, and by spring the earth is turned up in every conceivable direction in the search for the potatoes. The latter are from one-half to three quarters of an inch in diameter, and of good flavor—tasting somewhat like boiled chestnuts. The Navajo Indians consume such large quantities at a time as to cause griping pains, and as a remedy take at the same meal a quantity of earthy matter containing magnesia, which relieves the stomach. Some years ago a quantity of the tubers of this species of potato were received and distributed by the Department of Agriculture. Reports from various localities stated that, in many cases, these improved under cultivation, and increased largely in size.

## Labor and Wages in Bordeaux.

According to the report of United States Consul Gerrish, Bordeaux, with 150 workmen's societies, has thus far been exempt from strikes, or other reckless action, by any class of laboring men. They are more patient, orderly, and prudent than the workmen in other parts of Europe. Bordeaux suffers from an unusual number of cafés—nurseries of idleness, but not of drunkenness. Light wines and beer are the common beverages. Although rum, gin, and brandy are to be had at low prices, they are rarely used. Saving societies exist to some extent among the laborers, encouraged, in some instances, by wise and benevolent capitalists.

Farm laborers are frequently so economical as to become quite wealthy proprietors. They are paid 380 to 420 francs a year, lodged and boarded; if not boarded, but are lodged, they receive as high as 800 to 850 francs per annum. Day laborers, without board, receive 2½ to 3 francs a day, with a bottle of wine. A suit of clothes costs 15 to 20 francs. Coopers, ship carpenters, and foremen in wine cellars, by great frugality, attain a condition of comparative independence. The average wages of mechanics may be stated at 4 to 4½ francs per day—an increase of nearly 1 franc since 1873. The cost of living has not increased, but rather decreased. In 1875 the decrease was notable in bread, meat, and potatoes. A government cigar factory was established here in 1816. It employs 150 men and 1,400 women. The men earn about 5 francs and the women 2 francs a day.

The value of the tobacco used is 15,000,000 francs annually, much of which is imported directly from the United States. Over 700 cooper shops exist in the district, employing more than 4,000 men. The number of casks made annually is 1,200,000, and their value 17,000,000 francs. The staves come principally from the borders of the Baltic and the Adriatic. A few come from the United States. More would be imported if they were not so bunglingly made. It is alleged that it takes a third longer to prepare an American stave than it does one from the Adriatic. They should be split, not sawed. About 15,000,000 bottles are made annually in the city by seven factories, employing 700 workmen, who are paid by the 100 bottles, and who earn as high as 12 francs per day, according to their skill. Four factories, with 300 men earning from 3 to 6 francs per day, make 3,400,000 white glass preserve jars and perfumery bottles. At least one third as many more are imported. Only a fraction of the number of corks used in Bordeaux are made there, say 10,000,000. Cork cutters receive 2 to 2½ francs per 1,000. 100,000,000 of corks are imported. More than 1,200 persons are engaged in the manufacture of liqueurs and confitures. In the autumn, double the number are employed. Men earn from 3 to 4 francs per day, and women about half as much. The annual value of these products is 10,000,000 francs.

## A Contrast.

One strictly American idea—the elevated street railway—is not likely to be adopted in any city of Europe. Foreigners are lost in amazement as they read of the inroads made by the elevated lines in New York on the property, the comfort, and all the rights of the people. They cannot understand how and why we tolerate such trespassers. In London, where rapid transit is in operation to an extent elsewhere unknown, the elevated road, of the pattern with which we are too familiar, would cause a riot if not a revolution. The Englishman, with his lofty notions of individual rights, would not stand it a moment. No British capitalist or speculator is bold enough to start such a scheme at home. They come for it to New York, where the people are so used to misgovernment and railway usurpation that they have almost ceased to resist.

We hear much from the great stockholders of the elevated lines about the discomfort and many inconveniences of traveling on the London underground lines. To these in-

terested statements the best answer is the steadily increasing patronage of those lines. In order to meet the public demand new routes and connections have been planned in London—all underground. Even less of a habitual growler than John Bull could find some objections—though mostly trivial—to this class of railways. It may be freely admitted that, for the passengers alone, traveling underground, though in the best ventilated tunnels and the most perfectly lighted cars, is no pleasanter than a trip on an elevated road. Safer it undoubtedly is. But the comfort and pleasure of passengers are not the only things to be consulted. And there is just where Englishmen and Americans are taking different views of rapid transit. In London everything is not sacrificed to the passengers. The people dwelling along the route are taken into account also. The roads are built underground (as a first reason) because they would there cause the least possible annoyance to the inhabitants of the streets whose crowded traffic they were designed to relieve. In this city rapid transit has been handled wrong end foremost; the passengers and the money the jobbers can collect from them are considered first, last, and always, and the property owners and lessees along the lines are nowhere.—*New York Journal of Commerce*.

## ASTRONOMICAL NOTES.

BY BERLIN H. WRIGHT.

PENN YAN, N. Y., Saturday, August 24, 1878.

The following calculations are adapted to the latitude of New York city, and are expressed in true or clock time, being for the date given in the caption when not otherwise stated.

## PLANETS.

	H.M.		H.M.
Venus rises.....	3 10 mo.	Saturn in meridian.....	2 00 mo.
Jupiter in meridian.....	8 51 eve.	Neptune rises.....	9 32 eve.
Saturn rises.....	8 02 eve.		

## FIRST MAGNITUDE STARS, ETC.

	H.M.		H.M.
Alpheratz rises.....	5 59 eve.	Procyon rises.....	3 04 mo.
Algor (var.) rises.....	7 39 eve.	Regulus.....	invisible.
7 stars (Pleiades) rise.....	9 58 eve.	Spica sets.....	8 29 eve.
Aldebaran rises.....	11 18 eve.	Arcturus sets.....	11 09 eve.
Capella rises.....	8 45 eve.	Antares sets.....	10 29 eve.
Rigel rises.....	1 28 mo.	Vega in meridian.....	8 20 eve.
Betelgeuse rises.....	1 13 mo.	Altair in meridian.....	9 32 eve.
Sirius rises.....	3 29 mo.	Deneb in meridian.....	10 24 eve.
Mira (var.) rises.....	10 12 eve.	Fomalhaut rises.....	8 39 eve.

## REMARKS.

Venus, Jupiter, and Saturn are the only planets now visible to the naked eye; Mercury, Mars, and Uranus passing the meridian nearly at noon. Venus and the moon will be in conjunction August 26, 4h. 4m. mo. When they are nearest, Venus will be close upon the moon's southern limb, and both bodies will be exactly one hour high. Mira Ceti, the "wonderful star of 1596," began to increase in brilliancy August 18, and will continue growing brighter until October 1, when it will probably be about 2.9 magnitude, remaining thus for fifteen days. Its maximum brilliancy is thought to vary from 1.5 to 5.0. It will be interesting to follow this variable through its changes.

## The Arabian Cure for Hydrophobia.

*Les Mondes* states that M. Reiche has recently addressed a communication to the Entomological Society of France on a subject of practical entomology of so interesting a nature that it deserves to be made known.

M. Reiche says that his colleague, M. De Sauley, sent him some fragments of beetles that he had received from Cabes, in Tunis. In regard to these his correspondent, M. Chevarrier, writes him as follows:

"I send you herewith the remedy of the Arabs against hydrophobia. It consists of specimens of two species of scarabs given to me at the south of Ouderna by a man of the tribe of the Amernas; he has a dozen of them, which he preserves as something very precious. In presenting them to me he detailed their virtues and explained the manner in which they are used. On my return to Cabes I spoke of this remedy to a very intelligent Arab, who assured me that all the statements of his countryman were true, and that these beetles were recorded in their medical works, where may be read that the *Derrona* (the insect) cures hydrophobia if administered within twenty days after a person has been bitten. The dose is a piece the size of a grain of wheat, to be given to the patient in a bit of meat.

"These insects possess powerful vesicating properties, judging from what the Arabs told me, and it would endanger the patient's life to increase the dose too much. The Arabs are unanimous in affirming the efficacy of this remedy, which will act, however, only during the eighteen or twenty days subsequent to the biting. It scarcely admits of a doubt that the remedy occasions dreadful attacks of colic, and, being extremely powerful, should be administered only with the greatest prudence."

M. Reiche states that the fragments which were sent him are those of coleoptera of the species *Meloe tucius* and *Mylabris tenebrosa*, belonging to the family of blistering beetles, and well known as powerful vesicants. Their congeners are common in France (and America), and it would be well to try a modification of the remedy by using for this purpose, say, the common Spanish fly (*Cantharis vesicatoria*).

It is possible that the terrible though happily rare affection, hydrophobia, might be averted by the internal use of vesicants, which, according to the facts given, would seem to be capable of destroying or neutralizing the virus of the disease. It should be remarked that the use of *Meloe* (especially *M. proscarabæus*) as an antidote to hydrophobia was long ago recommended, and that M. Fermaire communicated to the society in 1856 a pamphlet by Saint-Hom-bourg treating of this very subject.

**Reciprocity in Trade Marks between Great Britain and the United States.**

President Hayes has issued a proclamation, under date of July 30, 1878, to the effect that the Government of the United States of America and the Government of Her Majesty the Queen of the United Kingdom of Great Britain and Ireland, with a view to the reciprocal protection of the marks of manufacture and trade in the two countries, have agreed as follows:

"The subjects or citizens of each of the contracting parties shall have, in the dominions and possessions of the other, the same rights as belong to native subjects or citizens, or as are now granted, or may hereafter be granted, to the subjects and citizens of the most favored nation, in everything relating to property in trade marks and trade labels.

"It is understood that any person who desires to obtain the aforesaid protection must fulfill the formalities required by the laws of the respective countries."

Citizens of the United States who desire to obtain registration for their trade marks either in this country or in Great Britain may have the business speedily transacted through the Scientific American office on very moderate terms.

**American Institute Exhibition.**

It will not be the fault of this paper if the coming exhibition of this Institute should prove to be a chaotic mass of half arranged merchandise on the opening day (September 11), for we have so often given notice of the fact that an exhibition is to be held, and have as repeatedly given notice of the time; nor will it be the fault of the officers of the Institute, for the building is always ready in time; but will, we presume, be the fault of the exhibitor, who, as a general rule, procrastinates, and is often many days behind. We should think that an exhibitor would desire that his exhibit should be arranged upon the opening day, and not a week or ten days later. For information address General Superintendent, room 22, Cooper Union Building, New York.

**OLIVER'S SCREW-HEADED KEY.**

In the several figures in the engraving are represented different forms of a novel key for fastening the bosses of wheels, levers, couplings, etc., to their shafts. The novel feature of the key is its head, which is made cylindrical, and is threaded to receive the nut by which it is drawn from its seat. Where the key has its seat in the end of a shaft, as in Fig. 1, it is made straight, and the threaded portion is larger in diameter than the body of the key, to allow the nut to pass over it as the key is drawn out. In cases where a projecting head would be objectionable, the boss and shaft may be counterbored, as in Fig. 5, so that the end of the key will be even with the end of the shaft. When a key of this sort is to be removed, a short thimble will be placed over the head of the key before applying the nut, and the nut will have sufficient thickness to extend beyond the boss and shaft to receive the strong wrench employed in turning it.

When the key is used on a line shaft its head is offset, as shown in Figs. 3 and 4, to admit of receiving the nut. When the key is to be removed a U shaped piece is slipped over its outer end to form an abutment for the nut to work against. A key having a head of the ordinary form is liable to break under severe stress, and thereby involve considerable labor in drilling it out. And when a key is removed by means of a drift applied to its thinner end, the successive blows are apt to upset it and increase the difficulty of removing it.

In a manufactory filled with operatives it often occurs that the whole establishment must be idle for days on account of the difficulty attending the removal of a few keys. The improvement illustrated obviates these difficulties, and affords a quick and certain method of removing keys without injuring them, or the machinery of which they form a part.

In factories where explosive material is used or manufactured, as for example in powder mills, it is of especial advantage, as there can be no danger of explosion, as no blows or friction are required to remove the key, consequently no spark can be produced.

This invention was recently patented by Mr. Paul A. Oliver, of Wilkesbarre, Pa., from whom further information may be obtained.

**Export Grain Trade of the Mississippi.**

Previous to 1870 it was believed that grain could not be shipped to Europe by way of New Orleans, owing to the warmth and humidity of the atmosphere of the Gulf Stream. To disprove that hypothesis the Grain Association in that year sent experimentally 66,000 bushels of wheat to Europe by way of the mouth of the Mississippi. The next year 3,000 bushels of oats and 309,000 bushels of wheat were exported that way. The next three years the exports averaged about 1,500,000 bushels. In 1875 the shipments fell off to 308,000 bushels. In 1866 the jetty improvements led to the exportation, via New Orleans, of about 1,750,000 bushels, chiefly corn. In 1877 the shipments exceeded four million bushels, comprising 351,453 bushels of wheat, 3,578,057 bushels of corn, and 171,843 bushels of rye.

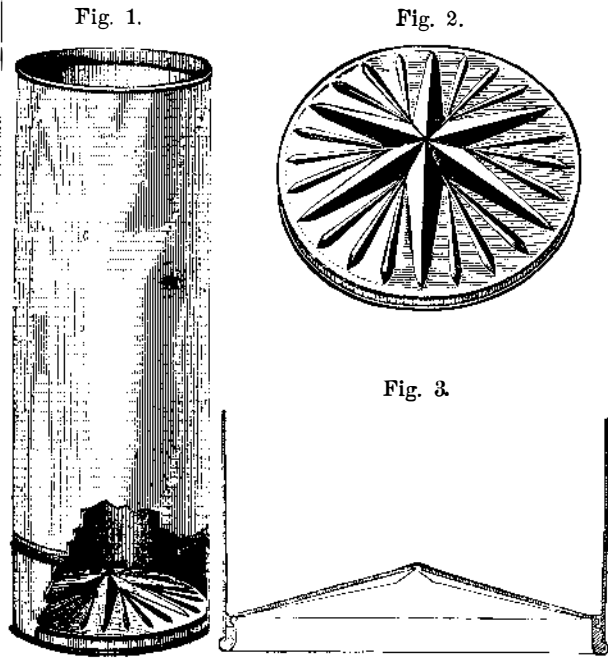
**Japanese Houses and Earthquakes.**

From the pamphlet of Messrs. Perry and Ayerton, Professors in the Imperial College of Engineering, Tokio, Japan, we learn that the houses in Japan are without the foundations we are accustomed to use; the vertical posts rest on detached stones, and there are no diagonal braces.

Thus the building can be displaced from its position of equilibrium by an earthquake shock without fracture occurring; the so-called "viscous resistance" to the motion, caused by the various joints, diminishing the motion and adding to the safety of the building, while the absence of diagonal pieces tends to lessen the strains.

**NEW TIN ROVING CAN.**

Probably there is nothing that causes more waste in the carding room than roving cans with imperfect bottoms. In

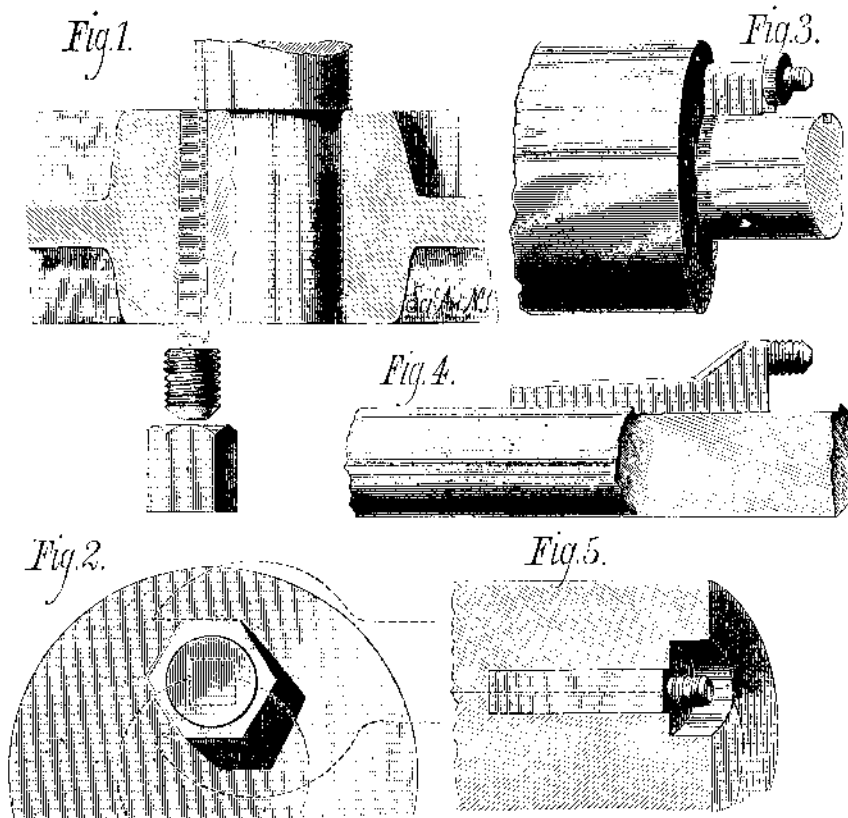


the accompanying engravings a roving can is shown which is calculated to withstand the abuse to which such articles are usually subjected.

The completed can with a portion of its side broken away is shown in Fig. 1. Fig. 2 is a perspective view of the indented bottom, and Fig. 3 is a vertical section showing the manner of putting the parts together.

The bottom is pressed up with a star-shaped indentation in the middle to strengthen and stiffen it. This construction gives the bottom a desirable form and permits of the use of light metal, and at the same time gives it rigidity.

The bottom is attached to a strong tinned iron hoop, and the hoop and bottom together are inserted into the lower



**OLIVER'S SCREW-HEADED KEY.**

end of the can, and a strengthening band is put around the can a short distance, say 5 inches, above the bottom, and attached by heading on to the body. When all of the parts are put together in the manner described, the bottom of the can is placed in a vessel containing melted solder and allowed to remain until the solder enters every seam and attaches the bottom securely to the body of the can, when the can is removed and allowed to cool.

We are informed that there are a great number of these cans now in use, giving great satisfaction.

Patented May 28th and June 18th, 1878, by James Hill,

261 and 263 Dyer street, Providence, R. I. For further particulars address the inventor as above.

**New Inventions.**

Messrs. Henry J. Hellert, Franck M. Müller, and Charles A. Meyer, of Vincennes, Ind., have patented Improvements in Bowling Alleys, by which the pins may be set up and the balls returned quickly by the players themselves, without requiring any person to attend to the pins and balls.

Messrs. Thomas Massey and William H. Rawe, of Pawtucket, R. I., have patented an improved Stopper for Bottles designed to contain beer or other effervescing drinks or liquids; and it consists in a bottle nozzle having curved slots in opposite sides, and in a yoke adapted to the slots in the bottle nozzle, and to a stopper of novel construction.

Mr. Vanderlyn H. Felt, of Kendall, N. Y., has patented an improved Lifting Jack, for raising the axles of wagons to allow them to be oiled, for raising tracks of railroads to ballast and level them, for raising fences to place blocks beneath them, and for other similar uses.

An improvement in Dyeing Apparatus has been patented by Mr. Alphenas V. Hysore, of Wilmington, Del. This improvement relates to apparatus for manipulating stock in a dye house, and for transferring it from one dye vat to another. It consists in an arrangement of hoisting mechanism and a track and a car of peculiar construction, to facilitate the transfer of stock from one vat to another.

Mr. Marcus H. Rogers, of Great Barrington, Mass., has patented an improved Newspaper Folding Machine. This invention relates to the class of machines that are employed in folding newspapers for mailing. The advantages claimed for this machine are that it may be placed under the fly of an ordinary power printing press, and it may be used in conjunction with the press, folding the papers as fast as they are printed.

Messrs. Charles E. Hart and Toby Johnson, of Lake Lillian, Minn., have patented a Combined Burglar Alarm and Indicator, which is operated whenever a cord, connected with the doors and windows of a dwelling, is subjected to tension by the act of opening a door or window. The place or apartment where the burglar is seeking an entrance is indicated upon a register, by means of numbers, one number indicating one place or apartment, and another another.

An improved Bottle Stopper has been patented by Mr. Alexandre Esprit Napoléon Agnel, of Paris, France. This is an improvement in the class of adjustable screw caps or stoppers for bottles used for perfumery, tooth washes, toilet waters, medicines, etc., from which it is desirable to discharge the liquid in drops or fine jets.

An improved Bobbin has been patented by Mr. John S. Crowley, of Manchester, England. The object of this invention is to protect wooden bobbins used in the manufacture of textile fabrics. It consists in a notched ring that is attached to the lower end of the bobbin, for receiving the lugs of the bobbin wheel.

Mr. Amandus Henning, of New York City, has patented an improved Stereotype Block. When the stereotype plates are secured to their blocks by the common method, and it is desired to adjust one of them in a form, it is necessary to unlock the entire form, thereby endangering the arrangement of the other blocks in the form, so that it frequently becomes necessary to readjust the form. Another difficulty common to the ordinary method of holding stereotype plates is that the face of the plate, near its edges, is often injured by the tools employed in fastening the blocks and locking the form. By this improvement these difficulties are obviated.

An improved Water Reservoir and Stove Pipe Shelf has been patented by Mr. John W. Barton, of Emporia, Kan. The object of this invention is to provide a cheap and convenient water reservoir, to be attached to the stove pipe, and to furnish a shelf for holding articles over the stove to keep them warm. The water in the reservoir is warmed without expenditure of extra fuel, and the space occupied by the reservoir is not available for other uses.

Mr. James Dawson, of Brooklyn, N. Y., is the inventor of an improved Attachment for the Hose of Fire Engines, the use of which will enable liquid chemicals to be introduced into the stream of water passing through the hose, so as to be thrown upon the fire with said water, and thus avoid the necessity of having a separate engine for throwing chemicals.

An improved Lamp Bracket has been patented by Mr. Bruno A. Neisser, of Battle Creek, Mich. The object of this invention is to provide a cheap and simple device, attachable to a sewing machine table, for supporting and adjusting the position of a lamp to light the operative at work without preventing the free passing on table of the garment operated upon.

Messrs. George L. Neville and Leroy C. Godwin, of Portsmouth, Va., have invented an improved Device for Canceling Stamps, which consists in a cap having thin sharp edges and two points, which are inserted in the stamp from the back and bent down over its face, to hold the edges of the cap against the back of the stamp.