About three weeks after the fishes were received the male began to build a nest. For this purpose he would come up to the surface of the water, take his mouth full of air, thrust it under the water, forming small bubbles of film like spittle, and continue thus to build a layer of these bubbles hanging quite firmly together, adding new layers until it was completed.

About twenty four hours after the spawning, the germ may be perceived in the pale yellow yolk of the egg—a day later the heart begins to beat—twelve or eighteen hours after the young, imperfect fish escapes from the egg, it is similar to a small tadpole. In eight months it is full grown. So long as the fish needs parental care the male devotes himself to it. As soon as the young fish starts away he hastens after it, seizes it with his mouth, swallows it, and spits it out into the nest of foam. They care specially for the sick and feeble ones. As soon as the young fish no longer needs his assistance he forsakes it, without appearing to have any interest in its fate, and has no hesitation in devouring it.

The young subsist at first upon the foam of the nest, later upon small animalcules not visible to the naked eye, and finally upon the same food as the parents.—*From Brehm's Thierleben.*

Fire Resisting Doors and Shutters.

Experience has proved that the ordinary iron doors and shutters usually employed in warehouses do not afford the protection from fire (especially if a large one) that might be expected from them. The *Insurance World*, on this subject, mentions many instances where wood incased in tin has proved quite effective in preventing the spread of fires. but the writer also pertinently asks if human ingenuity cannot devise a door or shutter which will be more fire resisting?

Some English writers have expressed a decided preference for solid oak cased with tin or sheet iron over the ordinary rolling iron shutters, and, according to the *Insurance World*, as stated above, tin faced wooden doors have proved to be very efficient in this country. Mr. James Harrison, Superintendent of the Bureau of Surveys in the New York Board of Fire Underwriters, not long ago indorsed on the specification of a building about to be erected, as follows:

"Construction of doors and shutters herein described approved by the Board of Fire Underwriters. Batten doors, covered with metal, have been commended and preferred to iron doors for a long time."

The specification bearing the above forcible indorsement read as follows:

1. "*Iron doors.*—Iron doors are much better than nothing, as they will often check the spread of a moderate fire. In the case of a heavy fire, the heavier the frame the more likely they are to warp. Besides the usual danger of twisting and warping, they are liable to become red hot, and thus to communicate fire to contiguous goods.

2. "*Metal lined doors.*—The experience of underwriters shows that the most desirable doors are those constructed of double thickness of one inch tougued and grooved boards, crossing one another diagonally, well clinched and riveted. Then completely covered on edges and sides by jointed (not soldered) tin of the best quality, and nailed on under each joint with shingle nails. These doors to be hung with wrought iron strap hinges, crossing the width of the door and firmly bolted, and to be firmly latched into the solid wall. In size they should be two inches wider and higher than the passage way, and should be placed on opposite sides of the wall. When thus made, these doors will outlast a fire which would destroy the best of iron doors.

"Window shutters should be of similar construction."

Doors of this construction have not only been approved, but practically tested by fire. The English article approved of oak, which certainly would be better than most iron doors, but, when hermetically sealed in tin, the wood is transformed into charcoal and easily fractures across the grain. The tough yellow pine of this country burns very readily in an open fire, but does not lose its fibrous texture when charred. So our insurance contemporary thinks it may be preferable to a less inflammable wood in the hour of emergency.

Property owners often prefer galvanized iron to tin, but the former presents a greater metallic body to the fire, rises in blisters, and is not as desirable as the non-flexible tin, which is closely nailed at every joint. Human ingenuity may yet devise some better plan for protecting the doors and windows of warehouses; certainly some better fire resisting substance and arrangements than are now employed are very much needed.

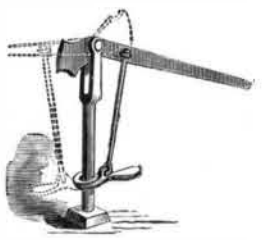
Preservation of Yeast by Cold.

It has already been shown by some experiments of Dr. Lintner's that yeast may be preserved, and yet retain its full vitality by being frozen. A practical confirmation of this on a large scale has just been obtained by H. Von Planitz. A quantity of yeast, which had been badly packed, was consigned to him, and on arrival, during some very severe weather, was found to be completely frozen. The solid block of yeast was broken to pieces by aid of a chisel and hammer, and crushed to a powder under a mallet; it was then mixed with water. and when the yeast had deposited, the ice which came to the surface was removed. Afterward the yeast was used in the usual manner, and yielded very good results, and yeast derived from it was in use for several months without showing the slightest signs of degeneration. Although these results fully confirmed the view that yeast is not injured by extreme cold, the same observer made a further experiment; he submitted a quantity of well-washed yeast to intense cold, and having frozen it into a solid mass, he kept it for four weeks at a temperature just below freezing. This yeast, on being used, gave equally good results. The experiments here referred to were with "bottom" fermentation yeast, but there is no reason to suppose but that similar results would be obtained with "top" yeast.

RECENT INVENTIONS.

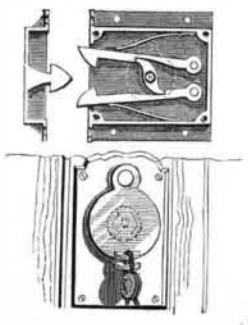
New Wagon Jack.

This a simple and inexpensive jack for use in removing the wheels from the axles of wagons or other vehicles. It consists in a lever combined with a post, and a clutch ring fitted on the post and connected to the lever for holding the latter in any position to which it may be moved in raising the axle. The lever may be reversed to adapt the jack to axles of different heights as indicated in dotted lines in the engraving; the rod of the clutch being loosely connected at both ends to admit of this arrangement. This jack can be readily operated without the necessity of crawling beneath the wagon to put it in place. It is very light and at the same time strong and durable, and can be folded up in a compact shape when not in use. Mr. Alonzo B. Furman, of Strattonville, Pa., is the patentee of this invention.



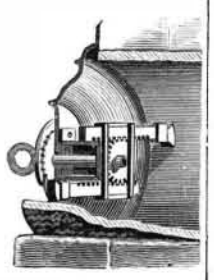
Lock for Sliding Doors.

The engraving shows a novel lock applicable to sliding doors and gates generally, but specially designed for the sliding doors of freight cars on railroads. The lock is provided with movable jaws or hooks pressed by springs and limited in their movement by stops. These hooks engage with a catch of dart-head form, and are separated so as to release the catch by means of a tumbler, which acts on both hooks alike. The tumbler is fitted with a key which will turn it when properly inserted, and the keyhole is provided with an escutcheon that may be sealed, so as to close the lock effectually. This useful invention has been patented by Messrs. Charles S. Rees and Patrick Mills, of Pueblo, Colorado.



Improved Flue Stop.

This is a flue stop that will fit and cover different sized flue or stove pipe holes, and which, although working in connection with the thimble or other lining of the flue hole, is an independent structure, and is capable of being adjusted so that no amount of soot or other dirt or wind will force it out of its place. The invention consists in the combination, with a flue hole plate or cover, of anchoring braces capable of being adjusted in opposite directions by a pinion working in racks on the braces. The braces are fitted with rubber bearing blocks on their outer ends, to insure a firm hold of the braces in the chimney crock or thimble. A spring pawl engaging a ratchet on the spindle of the pinion holds the braces extended, and thus secures the stop. The stop is released by disengaging the pawl from the ratchet, and turning the spindle so as to retract the braces. This useful invention has been patented by Mr. James W. Webster, of Monticello, I .

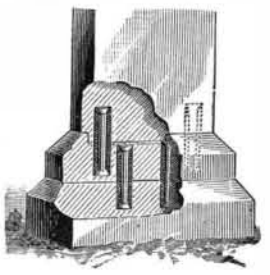


Improvement in Oil Cans.

The object of this invention is to prevent the oil outlet of an oil can from getting stopped up, to enable the operator to see how much oil is given to each hole. and to facilitate the removal of dirt and grease from the oil holes before oiling. The invention consists in the combination, with an oil can, of a wire passing loosely through the nozzle and into a tube secured on the bottom of the can and within it. The outer end of the wire is curved, and part of the wire is finely grooved or roughened. By pressing on the bottom of the can in the usual manner, the wire is moved forward and back longitudinally in the nozzle, and the oil that is spurted out passes in single drops along the wire. It cannot drop from the same until it arrives at the end, for the fine grooves or roughnesses between the points assist materially in preventing the oil from dropping off the wire, and at the same time facilitate the flow of the oil toward the end of the wire. Address the patentee, Mr. J. A. Campbell, care of Wallace & Brooks, Waco, Texas.

Improved Tombstone.

The engraving shows a tombstone, the several parts of which can be united easily and quickly in such a manner that the whole will be very rigid. The base is formed of a bottom section, and an upper section on which the top stone rests. The upper base section is provided with a mortise in its top, into which a tenon formed on the lower end of the top stone is fitted. Two or more holes are bored in the lower end of the top stone, and dowel pins having enlarged or widened ends are passed into them, and then the space between the pins and the sides of the holes is filled with melted sulphur. In a similar way holes for receiving pins are formed in the top of the upper base section and extend through into the top of the bottom base section, and pins with enlarged ends are passed into the holes and fastened as in the first case. This forms a permanent fastening that will last as long as the stone endures. Mr. William Mould, of Saugerties, N. Y., is the patentee of this invention.



On the Action of Certain Metals upon Oils.

Some time since Chevreul, the distinguished investigator of the fats and oils, studied the effect produced upon the drying oils by different metals. (*Memoires de l'Acad.*, xxii.) He found that under certain circumstances metals exerted an influence upon the oxidation of the oils; for example, linseed oil when spread upon a sheet of lead dried immediately.

A. Livache believed that the metals would act more energetically if in the fine state of division in which they are obtained by precipitation from solution, instead of using only surfaces of sheets of metal. His experiments, which are exceedingly interesting, were published in *Comptes Rendus*, xcvi., 260.

Livache tried the effect of tin, copper, and lead on the oils, but only the last named exerted any considerable action. The lead employed in the experiments was obtained by precipitation with strips of zinc from the solution of a lead salt; it was quickly washed with water, then with alcohol and ether, and finally dried *in vacuo*. If this lead is moistened with a certain quantity of oil and then exposed to the air, in a short time an increase of weight is observed, and the more drying the oil the greater this increase. When raw linseed oil is treated in this way, the increase of weight attained its maximum in thirty-six hours, while the same oil, if merely exposed to the air alone, requires several months to reach this state. A solid but elastic substance is formed like boiled linseed oil dried in the air.

Experiments made with different oils show that the increase of weight is nearly the same as that of their fatty acids when exposed to the air for a few months.

Name of oil treated with precipitated lead	Increase of weight in oil. In 2 days.	In 8 days.	Increase of weight of fatty acid. In 8 months.
Linseed	14·3 per cent.	....	11·0
Walnut	7·9 "	....	6·0
Cloves	6·8 "	.	3 7
Cotton seed	5·9 "	....	0·8
Beech nut	4·3 "	...	2·6
Rape	0·0 "	2·9	2·6
Sesame	0·0 "	2·4	2 0
Peanut	0·0 "	1·8	1·3
Rape seed	0·0 "	2·9	0 9
Olive oil	0 0 "	1·7	0 7

Cotton seed oil was the only drying oil that showed a marked exception; the fatty acid from it exhibited a very slight increase of weight. That is probably the reason why this oil can play a double role, as a drying and as a non-drying oil, for it is used to adulterate linseed oil on the one hand and olive oil on the other.

Contact with precipitated lead, then, imparts to oil the property of absorbing oxygen rapidly. In his study of the oxidation of the oils, Cloez has shown that it is always attended with the total disappearance of the glycerine, and in Livache's experiments it was noticed that the glycerine was modified by the precipitated lead. If glycerine is mixed with precipitated lead in a tight bottle free from air, the lead soon vanishes, being oxidized at the expense of a portion of the glycerine, and then dissolved in it. [This may help to explain the action of the new French form of electric accumulator, where the lead plates are placed in glycerine.]

The facts above stated indicate that a rapidly drying oil can be obtained by simply treating linseed oil for some time with red lead or litharge, although the product thus obtained always remains greasy and does not dry as good and quick as boiled linseed oil.

In the arts advantage may be taken of this action of lead toward drying oils, as for example to prove the presence of cotton seed oil in linseed oil as well as in olive oil. Probably boiling may be dispensed with by substituting mere contact of the oils with precipitated lead, or solutions of lead and strips of zinc on which the lead may be deposited in a fine state of division. Oils prepared in this way are always of a lighter color, and retain a greater degree of fluidity. Perhaps the bad smell of boiling oils and the great danger of their taking fire in the operation can be avoided by this treatment.