

Islands, France, Spain, and Algeria, were united into one grand system of triangles, reaching from the Sahara (34° N. L.) to the northernmost of the Shetland Islands (61° N. L.), giving a meridian arc of 27°, the greatest hitherto measured on the earth.

NEW LIFE PRESERVER.

The engraving shows a novel life preserver recently patented by Mr. Rufus E. Rose, of Gretna, La., which may be combined with different garments worn upon the person, or it may be made as a separate article and worn independently of the clothing.

The invention consists in several air chambers, A, provided with inwardly opening valves, C, which may be operated independently, and an air supply tube, B, communicating with the several chambers through separate valves.

Fig. 1 shows the life preserver inflated and ready for use; Fig. 2 gives a good idea of the size of the life preserver when rolled up and out of use, and Fig. 3 is a transverse section showing the arrangement of the valves.

The chambers are inflated by blowing through the supply tube, which is provided with a suitable mouthpiece. The great advantage of this form of life preserver lies in these separate chambers. One or more of the chambers may be punctured without destroying the efficiency of the device, as the remaining chambers will retain their charge of air.

This life preserver when uninflated is so light and compact that it may with convenience be combined with some of the garments worn by the user, when it will always be in position for use. The form shown in the engraving is fitly called a "pocket life preserver," as it may be rolled into so small a package as to be conveniently carried in the pocket, occupying no more space and weighing less than an ordinary diary or memorandum, and when it is inflated it is sufficiently buoyant to sustain two persons.

The inventor informs us that this invention was suggested by an article in the SCIENTIFIC AMERICAN some time since which pointed out the necessity for such an invention.

Further information in regard to this life preserver may be obtained by addressing the inventor as above.

Endurance of Boilers.

Some idea of the difficulties encountered, in the use of the impure water in locomotives in some of the Western States, may be formed from the following extract from a letter from a master mechanic in that region to the *Railroad Gazette*:

"At this end of the road, where we have so much alkali water to contend with, we are obliged to change the flues every six months to get the scale out of the boiler and from around the fire box. Along with this we wash our engines thoroughly the best we can for every four hundred miles run, with a force pump and seventy pounds pressure, taking out the blind flues, mud drum head, and all the wash-out plugs in the sides and in the legs of the boilers, and even with this constant work our flues will not last longer than six months without giving us a great deal of trouble from leaking on account of the mud and scale."

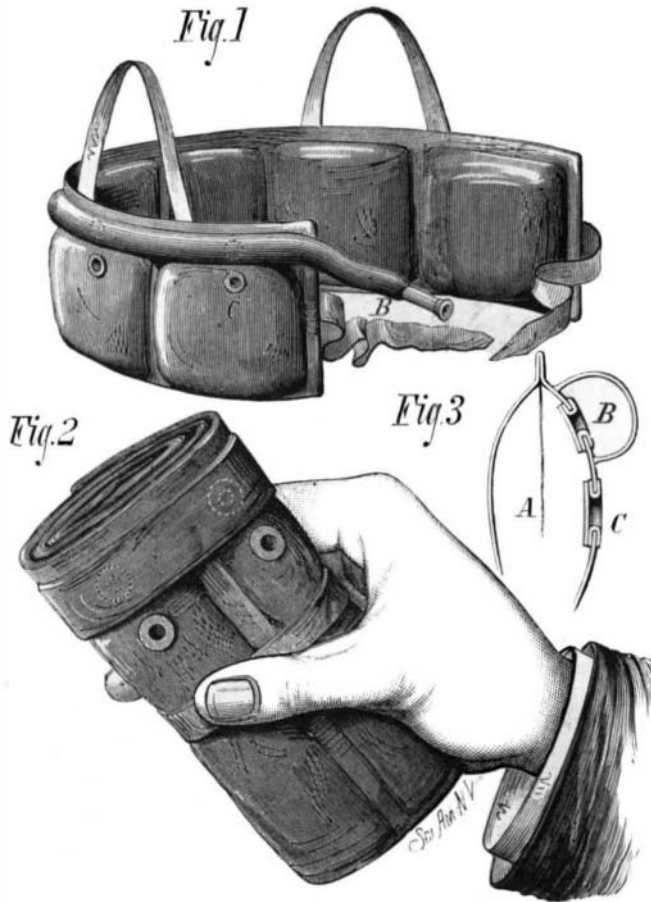
NEW BOILER CLEANER.

The operation of removing the sediment and loose scale from beneath the tubes of locomotive boilers, when conducted in the usual way, is laborious, expensive, and damaging to the boiler, as no means of access to this part of the boiler is provided, and the steam pipes and exhaust nozzles have to be removed and the ends of the tubes cut off before the bottom of the boiler can be reached. This being the case the examination of the boiler is often deferred, so that a great mass of scale and sediment accumulates and hardens so that it can be removed only by means of the hammer and chisel.

The invention shown in the annexed engraving is intended to overcome these difficulties, and to furnish a convenient and effectual means of loosening and moving the scale so that it may be easily removed. The invention is applicable to all kinds of tube boilers, but is more especially useful on boilers of the locomotive type.

It consists of two tubes, A B, provided with jet openings or tubes, and having external connections leading to a boiler for supplying steam or to a supply of water under pressure. The inventor prefers to make these jet tubes of brass, and to place them in the positions indicated in the engraving. The jets of the tube, A, are directed across the crown sheet, and the jets of the curved tube, B, point toward the water leg of the boiler, and in the upper surface of the curved tube, B, there are jets pointing upward. When jets of steam are

admitted to the boiler through the tubes, A B, the scale is loosened and moved to the water leg, from which it may be easily removed through the hand holes. The inventor states that steam removes the scale from the tubes with surprising rapidity, so that they are left in good condition for generating steam. When two or more stationary boilers are used in one locality the steam from one may be used to clean the other. Where there is only one boiler a well jacketed steam drum may be used to store up a sufficient quantity of steam to clean the boiler. In the case of large round houses the inventor proposes to apply a large stationary boiler to this purpose, placing it centrally and providing it with suitable connections for conveying the steam to the cleaner in any of the empty locomotives. By an arrangement of this kind



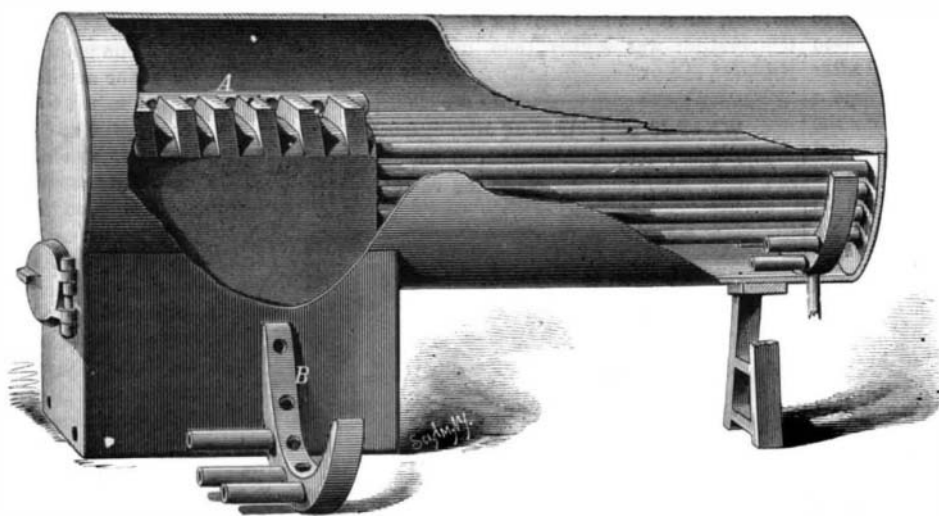
ROSE'S LIFE PRESERVER.

two locomotives could be cleaned and washed at once. The inventor does not confine himself to any special form or arrangement of this cleaner, as it can be adapted to any style of boiler. The application of this device to a boiler economizes fuel, improves its steaming qualities, prevents pitting, and saves a great deal in the way of repairs.

This invention is protected by United States patents issued to Mr. Winslow Titcomb, of Waterville, Me.

ENGINEERING INVENTION.

An electric car brake, patented by Mr. Philip V. Conover, of Uvalde, Texas, consists of a pinion attached to the car axle, the pinion taking in a ratchet wheel provided with a



TITCOMB'S BOILER CLEANER.

projecting pin that enters into the slots of a wheel provided with a sleeve, upon which the brake chain is wound, which sleeve can be moved on the axle by means of a lever that is actuated by a rod passing into a helix connected with a battery on the locomotive. A pawl tooth that is held in place by a slide prevents the unwinding of the brake sleeve until the slide is removed by a lever actuated by a rod passing into a helix likewise connected with the battery on the locomotive.

Practical and Useful Inventors.

In almost every community is to be found at least one man who professes to have given the first hint toward the perfection of some invention that has brought its introducer fame and fortune, neither of which the suggester shares. It may be that in some instances this claim is correct, but usually the sympathies of the people are with the man who does rather than with the visionary who dreams; for there is generally a hard road to travel between the conception of an improvement and its practical adaptation and final success.

There was a time when the inventor was essentially a dreamer; when he environed himself with mystery and was content with the homage of the ignorant. No paternal and wise government extended over him the protection of letters patent; the people did not want his improvement; the world was not ready for him. Chemistry was used to discover the transmutation of metals or the elixir of life, and mechanical knowledge to construct a toy with which to amuse and astonish the ignorant. These men, who thought and wrought in the twilight of science and the dawn of the arts, undoubtedly contributed something to us of the after ages, although in many cases they left their records in ambiguous puzzles. The shadows of the great minds who walked in the slant rays of the rising sun are projected across the plane on which our inventors travel.

But such men as Watt and Arkwright and others diverged from the secluded paths of these impractical thinkers and essayed the broad road of utility. Under their hands the scientific toys of the philosophers became the useful adjuncts to man's needs. This is the true secret of the inventor's success. Utility should be his guide and aim. It is not enough either that he conjectures and speculates: he must demonstrate by actual experiment, on a scale sufficiently large to prove the value of his invention, before he is legally or even properly entitled to the distinction or the reward of the inventor. One may sit and dream day after day of a conjectured improvement, and even feel assured of its value, but it will avail him nothing unless by experiment he builds a foundation better than "the baseless fabric of a vision." While he dreams it may be another is working out a similar dream. It cannot be doubted that many valuable improvements, now in general use and yielding handsome incomes, would have borne another's name and enriched another's pocket if the original inventor had wrought out his discovery to a practical result.

The work of the inventor is not, then, as the *Boston Journal of Commerce* further adds, merely to devise and calculate—to dream and imagine—but to demonstrate and prove by experiment. The true inventor is not a mere visionary, seeing the road and pointing to it, but is a moving, animated man, clearing obstructions from his path and leading the way. If he is independent enough to strike out a new path to a result, he must not be content merely to survey it, but must lay out the road, grade it, and propel himself and his improvement over it, before he can expect to levy toll on those who travel after him.

Testing Railway Employees for Color Blindness.

The work of examining the 5,000 employes of the Pennsylvania Railroad Company to discover their capacity to distinguish colors and forms, was begun in Jersey City, April 1. Acuteness of vision was tested by means of printed cards placed at a distance of about twenty feet; also by means of small openings in a screen illuminated on the further side. Many who successfully passed these ordeals failed signally on the color tests. Three skeins of woolen yarn were used, one being light green, the second rose, and the third red, and were marked respectively 1, 2, 3. Each of these was placed on a table in front of the person examined at a distance of three feet, and, with the vision of either eye obstructed by a spectacle frame, the man under examination was requested to name the color. He was also directed to pick out a similar shade to the one in question from different skeins of woolen yarn, numbered from 1 to 36. One young man correctly designated the test skein as red, but on being told to select a similar shade from the skeins before him he picked three shades of blue, two of yellow, and one of red. He could

distinguish no difference, and the same thing happened to half a dozen others who followed him. The skeins on the row were then divided into three sets, with twelve numbers in each, and the men were then examined as to color blindness. Some were able to distinguish all the shades of green, but failed lamentably in picking out the different shades of red.

It is said that the officers of the road were greatly impressed

by the results obtained, and that the directors of the other railways terminating at Jersey City are likely to adopt the same system of examination for their employes.

RAILWAY CREMATION.

It is a pretty universally recognized fact at the present day that burying such animals as have succumbed to a pes-

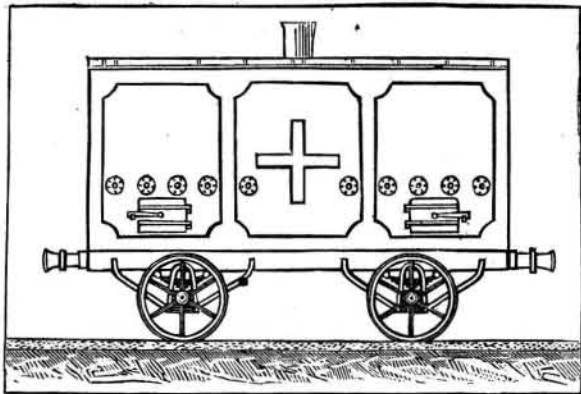


FIG. 1.

tential disease is not sufficient to destroy the contagious germs which remain in their bodies. This has been shown especially by the researches of Messrs. Pasteur, Chamberland, and Roux. These gentlemen have ascertained that when infected blood is consigned to the earth the bacteria are preserved therein in the germ state, multiply, and, in a short time become transformed into corpuscles which can be detected after remaining in the soil for several months. We ought to welcome, then, a new method of cremation which has been invented by Messrs. Kuborn and Jacques, and which satisfies every sanitary necessity by furnishing an easy means of totally destroying the infected animals. The two accompanying engravings give an exact representation of the apparatus. As shown in Fig. 1, it looks externally like a railway car; but it differs in the fact that rails are dispensed with, the car being drawn on the surface of the ground by horses or mules. Fig. 2 shows the arrangement of the interior of the apparatus. The closed space, A, is designed to receive the cadavers. It is a chamber having walls, R R, impermeable to heat. The bottom is composed of two dead plates, S, both of refractory material, the lower extremities of which terminate in a well, B, so as to form a hydraulic joint. Beneath these dead plates are located two fire places, F F, provided with movable working holes, which, by regulating the introduction of the air, allow of perfect combustion being obtained. The products of combustion reach the chimney through the flues, C, C', and C''.

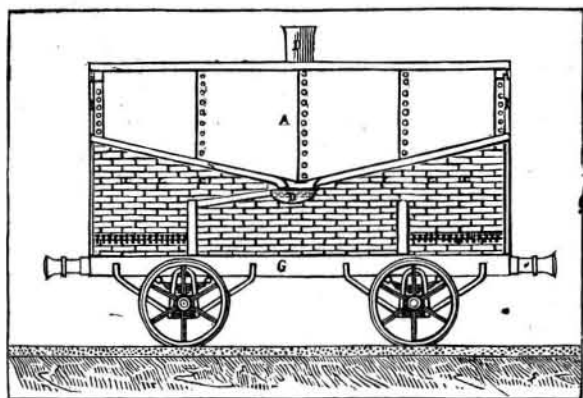


FIG. 2.

Any kind of fuel, no matter what, may be used. The apparatus is simple, and is easily operated at but trifling expense.

Packing Apples with Salicylic Acid.

There are few greater treats during the winter and early spring seasons, says the London *Magazine of Pharmacy*, than the magnificent apples which are imported from America to find their places on the dessert table in England. Considerable numbers, however, arrive here in a bruised condition from the effects of careless packing; a certain amount of fermentation is set up, and unless they are consumed without delay, they are lost to the dessert table. This is more frequently the case when barrels full of the so-called "Newtown pippins," and others, have been exported by private individuals to their friends in England, than when they are packed by the regular tradesmen. There is no reason why this splendid fruit should not be imported here almost as fresh and blooming as when it is gathered from the tree. A common but soft kind of tissue paper should envelop each apple before it is placed in the cask, and this tissue paper should have been soaked in a solution of salicylic acid and dried before it is used. The best preparation of salicylic acid for this purpose is the alcoholic solution, made with the strongest spirit, and then diluted with as much water as it will bear without precipitating the acid, so as to make the solution go as far as possible. Each apple should be enveloped in at least three or four folds of the salicylated paper, and every possible precaution should be taken to prevent bruising when loading into the casks or cases. Well packed apples should not move at all during the voyage, and the shaking of a railway train should have little effect

upon them. Nevertheless, a certain amount of contusion is inevitable, and to avoid the ulterior results of this, the salicylated paper is indispensable. As to the cost it would be a mere trifle when we consider the result gained, and the splendid condition of the fruit when it enters the London market. Besides, it is very probable that the salicylic acid paper used for packing the apples in America, might be used over again, or applied here in England to some similar antiseptic purpose, and an allowance made for it accordingly.

SEA BEANS.

BY A. W. ROBERTS.

So much confusion of ideas exists about these so-called sea beans in the minds of most people that I have taken the trouble to obtain all the information obtainable about them.



Fig. 1—Seed of *Entada scandens*.

Fig 1 is the seed of a vine, the *Entada scandens*, which grows in the tropical portions of both hemispheres. The vine is chiefly remarkable for the large pods and seeds, the pods often being from six to eight feet long, divided into numerous joints, each one of which contains a bean. In some parts of India these beans are used as weights. In London the seeds are sold under the name of "West Indian filberts." These sea beans are found in large quantities on the coast of Florida, particularly after northeast storms. These beans are worked into various trinkets, such as perfume bottles and snuff boxes. One of our leading jewelers has had some of these sea beans to polish and mount in gold for watchseals and lockets. For polishing the best materials are fine pumice stone powder, putty powder, and rotten stone. After the roughness of the outside of the bean is taken down with the pumice stone powder to a uniform surface, then put on the second polish with putty powder and oil. After which finish with rotten stone and oil on a lap wheel.



FIG. 2.

Any one handy with the graver can embellish these beans with every style of device desired. The beans should be first boiled in water for a half to one hour to soften the outer coating. After the outer coating is softened give it a coating of Winsor & Newton's Chinese white, on which the drawing is made for the engraver to follow. One of the prettiest styles of ornamentation of these beans is that of monograms inlaid with gold bronze. These beans are believed by most persons to be a product of the ocean from the fact of their being found on different parts of our seashore, particularly of the Southern States. I have found them on both the Massachusetts and Long Island shores. They have also been found on the coast of Scotland and as far north as the Loffoden Islands, off the coast of Norway.

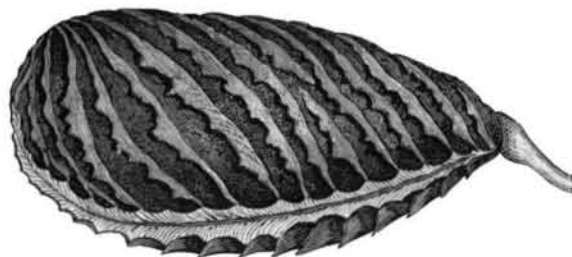


FIG. 3.

Figs. 2 and 3 represent the bean and pod of the "asses-eye," the scientific name of which is *Mucuna urens*. This bean is also a native of the West Indies, and is borne to the Florida coast by ocean currents. These beans have of late years been sent north from Florida in large quantities for the use of jewelers and tortoise shell workers, who convert them into charms for watch chains. They are capable of receiving a very high polish, the same materials being used as directed for polishing the *Entada scandens*. Miniature compasses and portraits are often introduced as a setting in these beans. They grow in short stout pods, covered with brownish bristly hairs, which easily separate, and when handled stick in the fingers, producing an intense itching sensation. The pods of this bean are used to adulterate the pods of the *Mucuna pruriens*, of which the hairs are the official portion. These hairs are the cowhage sold by drug-

gists and commonly known as "cow-itch." *Mucuna urens* is a perennial climbing plant, which twines round the trees and rises to a considerable height. The flowers are yellow and large, and resemble the pea blossom in form; usually placed in twos and threes in short peduncles.

The hairs of the *Mucuna urens* and *Mucuna pruriens* are possessed of powerful vermifuge properties, and act mechanically by penetrating the worms.

Legal Responsibility for Machinery Accidents.

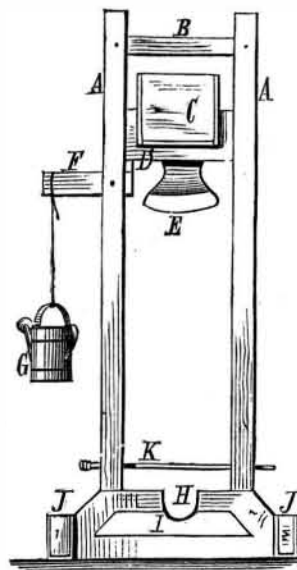
The Supreme Court of the United States has laid down the law as to the responsibility of employers for the lives and limbs of their workmen. They must not expose them to perils which can be guarded against, and if the servant reports defective or unsafe machinery, the master becomes responsible if the repair or restoration is not promptly made. The doctrine, familiar to English courts but never hitherto adopted here, that the acts of a superior officer or workman under a corporation are as those of the employer, and the latter is responsible for negligence involving disastrous results, was affirmed. The case was that of a railroad engineer who lost his life while saving his passengers from an accident, the result of a defect in his engine to which he had called the attention of the master mechanic. His widow sued the railroad, the Texas and Pacific, for \$80,000, but was ruled out of court in Texas. *Lefel's News* thinks the lady will probably be more successful on the retrial which has been ordered.

Operating Elevated Railroads by Electricity.

We learn from our foreign exchanges that the Council of Magistrates of the city of Berlin have appointed a special committee of engineers and architects to examine into and report upon the proposal submitted by Siemens and Halske for the construction of an electric railway across a portion of the capital. It is intended to begin the line at Belle Alliance place and run it through Friedrich and Chaussee streets on to Wedding place. The tracks—one for the up and the other for the down trains—will be supported by iron columns, 14 feet 9 inches high and 33 feet apart. The carriages are to be narrow and short, having only ten sitting and four standing places. The electro-dynamic machine to move the train will be placed under the floor of the carriage between the wheels, and a steam engine of 60 horse power to produce the electricity will be placed at the terminus. There will not be many stoppages, and the rate of speed is estimated at about twenty miles an hour.

INSANE INGENUITY.

Stephen M. Pillsbury, Jr., of Chelsea, Mass., an unmarried man of thirty, with a hereditary taint of insanity, guillotined himself April 20. He is described as a temperate, retiring sort of fellow, in prosperous circumstances, and on good terms with his family and friends. His special weakness was a morbid taste for reports of criminal matters and suicides. Evidently his desire was to do something notable, but owing to feeble health and probable lack of physical courage, he could see no way to distinguish himself except by suicide. Accordingly he constructed an apparatus like that figured herewith (copying a contrivance used for a like purpose in a Western State five or six years ago), and deliberately cut off his own head. He set up his apparatus in the barn, using therefor such materials as were handy. The standards were joists, A A, extending from the floor to the loft, to the under side of which they were securely spiked, a brace, B, adding to their stability. The lower ends of the joist were mortised in a block of hard wood, the top of which was rudely hollowed out at H to support his neck. Boxes of stone, J J, on either side kept the apparatus steady. Fitted between the uprights, so as to slide easily, was a piece of two-inch plank, to which was fastened the blade of a broadax, E. On the top of the slider was a box, C, loaded with stone. A lever, F, pinned to the left upright supported at one end the slider, balanced by a watering pot, G, at the other end. A broom handle, K, thrust through the supports near the base served to hold the suicide's head in place, and a leak in the watering pot let off the guillotine when he had stupefied himself with ether placed under his nose in the trough, I. The apparatus answered its purpose reasonably well, and probably could not have been put to any better use. We are not sure, however, that it would not be well to re-enact the old custom of midnight burial at the crossroads, stake and all, for such as make an end of themselves in such untidy and, to their friends, shocking ways. With so many means at command for decently slipping off the mortal coil bodily mutilations are not to be tolerated.



PILLSBURY'S GUILLOTINE.