

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."

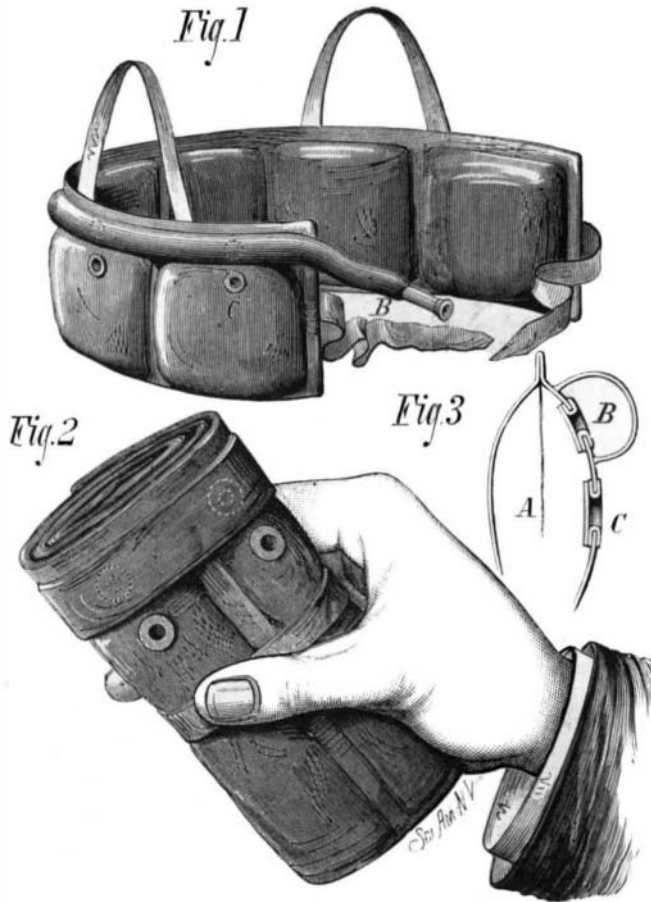
#### NEW BOILER CLEANER.

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



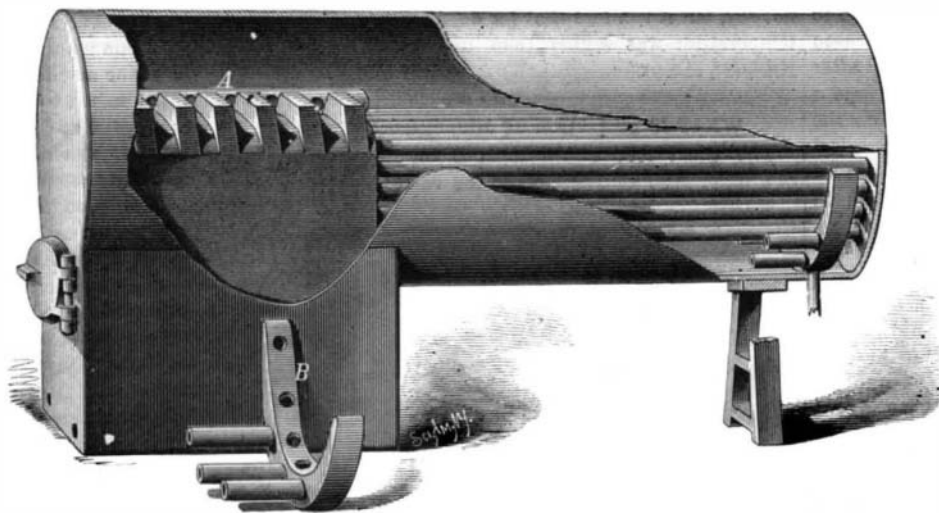
ROSE'S LIFE PRESERVER.

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