

Improved Gage Cock for Steam Boilers.

Our engravings illustrate an improved gage cock for steam boilers, which is extremely simple, though quite unique in design. We judge it is not likely to get out of order, and that it must be very convenient in use.

It consists essentially of only three parts, a weight lever ball, A, Fig. 2, a barrel, B, which screws into the boiler in the usual manner, and a nozzle, C. The nozzle, C, telescopes over the barrel, B; the barrel has a straight steam passage through it, closed by the nozzle which abuts against the end of the barrel, and has a gasket on its interior to make the joint formed steam tight. The use of the weighted lever or ball is to hold the nozzle against the end of the barrel, when the cock is shut, and to withdraw the nozzle when it is desired to open the cock. This is done in the following manner:

The weighted lever is pivoted to the barrel. It also has a recess that shuts down over the outer end of the barrel. On the inside of each of the two lateral walls of this recess is formed a cam groove, into which lugs, on the sides of the nozzle, enter, so that when the weighted lever or ball is turned upward on its pivot, the cam grooves force the nozzle outward, and when the weight descends, force it inward again, so as to bring the gasket firmly down against the end of the barrel. The cock thus automatically closes itself.

A small annular groove is turned about the outer extremity of the barrel, and collects any steam or water that may escape through between the barrel and the enveloping nozzle, and directs it downward out of the mouth of the nozzle. This renders a tight fitting of these parts unnecessary, and they may work with scarcely any friction.

The gasket may be renewed if desired, when the boiler is under pressure, by raising it up to and a little past the perpendicular, where it will remain. The nozzle can then be slipped off the barrel, the latter being plugged with wood while the repair is made. Upon withdrawing the plug, the nozzle may be replaced while the steam and water are escaping.

Patented, Jan. 16, 1872, by William Painter. For further information address Murrill & Keizer, Baltimore, Md.

GERHART'S IMPROVED WAGON BRAKE.

It is nearly as severe labor for horses to hold back a load in descending a hill as to draw it up the same grade. The use of a good brake upon uneven roads, therefore, both in economy and convenience, so strongly recommends itself to men of good sense as to scarcely need a word of argument. A great many forms of brakes have been made and used with advantage, but it appears that the useful combinations of devices adapted to this purpose have not yet been exhausted.

Our engraving illustrates a new combination of levers and links, by which the wheels of vehicles may be very effectively braked.

The brake bar, A, is supported by keepers attached to the underside of the rear hounds of the wagon, the keepers being sufficiently long to give the bar play to and from the rear wheels. About midway between the middle and the end of the brake bar is attached the link, B, which joins the brake bar to the lever, C. This lever is pivoted to a support extending forward from the rear axle, as shown, its short arm being on the side of the link, B. Its long arm is joined by the link, F, to the lever, D. The lever, D, is joined at its lower end with the brake bar, and is actuated by the connecting rod, E, which, when drawn forward, causes both ends of the brake bar to move backward, bringing the brake shoes very forcibly against the wheels to be braked. It will be seen on close inspection that a very powerful leverage may be thus obtained.

The dotted outline shows a mode of placing the lever, D, so that it shall drop back down on the bolster, in which case it is actuated in a slightly different way from that described.

The invention was patented through the Scientific American Patent Agency, Dec. 12, 1871, by John A. Gerhart, of Easton, Pa., whom address for further information.

The Erie Canal Locks.—Lockport.

An enlargement of the locks is urgently demanded, so as to permit the transit of steam canal boats carrying 600 tons of cargo, instead of 200 tons, the limit of most of the present boats. It is said that it will cost no more to propel a boat with 600 tons cargo, if the locks are made larger, than it now costs to tow the 200 ton boats. A writer in the *New York Times* gives an interesting description of the locks at Lockport, N. Y.:

On approaching Lockport, the eye is at once attracted by a sort of giant's staircase in the Erie canal, of even more imposing dimensions than the celebrated Giant's Staircase in the Doge's palace at Venice. Immediately the exclamation involuntarily escapes one: "Ah! Lockport! I see." It is at this point that, by an extensive system of lockage, the heavily laden barges are enabled to ascend and descend the low range of hills down which the canal takes its course, and on the extreme edge of one of which stands the active little city of Lockport, looking over one of the most extensive level plains in the State of New York.

There are five double locks, ten in all, at Lockport, each

lock being 110 feet long by 20 feet wide. They have a uniform rise of a little over 12 feet, making the total rise about 64 feet. The two head locks have 20 feet, the four lower tiers 18 feet of water. The time occupied in the passage of the boats from one lock to another varies according to their construction and running. Going east, a boat will pass through all the locks in from fifteen to twenty-five minutes; going west, more time is occupied, as the boats have to be pulled through by horse power on a rising tow path, instead of being forced through by the subsiding water, as is the case in going east. The boats have a tonnage of 200 to 240

The form of the bricks is shown in Fig. 1. It will be seen that they have a concave inner surface and a convex outer surface, as laid in the arch, and the sides are straight and parallel in their vertical planes. The ends are inclined, to correspond with the radii of the outer and inner curved surfaces. Each end is recessed vertically, so that each brick interlocks at the ends with two others, as shown, and is thus held from lateral movement, the entire arch, made by successive courses, being thus bound together.

This interlocking enables forms to be dispensed with after the first course is laid, as this course will give the same curvature to, and sustain, the next while it is laid and so on.

For arched roofing, as shown in Fig. 2, the bricks may be made lighter by being made hollow, or their composition may be modified, by the admixture of coal or other combustible substances, in the formation of the bricks, in ways familiar to brickmakers.

Floors will be made by first building an arch of low spring, as shown in Fig. 2, then leveling up the top with mortar, and, lastly, covering with cement.

Where light porous bricks are used for roofing, an outer coating of some waterproofing material will be needed. Cornices and gable ends can be made with ornamental bricks to give an appropriate finish.

This invention was patented through the Scientific American Patent Agency, August 9, 1870, by Watson F. Quinby, of Wilmington, Del. Address as above for further information.

Seals of Alaska.

The islands of Alaska are the summer resort of seals in immense numbers, but where they spend their winters is an unsolved mystery. Sufficient search has been made for their winter

abodes, with a view to taking their skins, to show that they do not land in any considerable numbers on any known ground. They begin to leave the islands early in October, and by the middle of December have all left, and none are seen again until April or May. A few hundred, mostly young pups, are taken by the Indians around Sitka, 1,200 miles east of the islands, during the month of December, again in March, on their return to the islands, and in February off the coast of British Columbia; but in such small numbers as to make no appreciable difference in the immense number that visit the islands annually. It is claimed by the natives that

the seals return invariably the second year to their places of birth, and, when not too often disturbed by driving, continue to do so. In order to test the truth of this story Mr. Bryant, Special Agent of the Treasury Department at St. Paul's Island, has instituted an experiment of an eminently practical character, although it might not command the entire approval of Mr. Bergh, whose jurisdiction, however, does not extend to Alaska. He had one hundred male pups selected before leaving, on a rookery one mile north of the village, and marked by cutting off their right ear; and a like number by cutting off the left ear, on a rookery to the south of the village. This has been done for two years, and next year the first will be old enough to be taken, when the result will be ascertained.

It is evident that sharks or other voracious fish prey on the young pups while in the water, from the fact that of more than a million pups

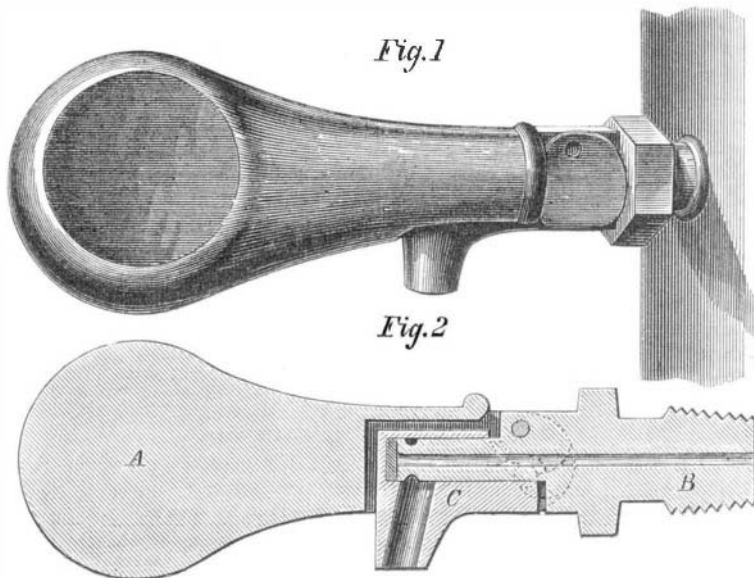
annually leaving the islands, not one third return to them in the spring.

Walrus Hunting.

Probably not less than fifty thousand walrus, with their young, were killed and destroyed last year by our arctic whalers. Three fourths of the fleet were engaged in the business, but the walrus had gone far into the ice, and they did not do so well. The arctic walrus, says the *New Bedford Mercury*, "never forsake their young, but will take them in their flippers and hold them to their breasts, even when their destroyers are putting their sharp lances through and through them and the blood is streaming from every side, uttering the most heartrending and piteous cries until they die. The walrus averages about twenty gallons of oil and four pounds of ivory. But the worst feature of the business is that the natives of the entire arctic shore are now almost entirely dependent upon the walrus for their food, clothing, boots, and dwellings. Twenty years ago whales were plenty and easily caught; but they have been driven north, so that now the natives seldom get a whale. This is a sad state of thing for them. The question now is, shall our whalers keep on taking the walrus, and eventually starve and depopulate these arctic shores? It will certainly come to that soon."

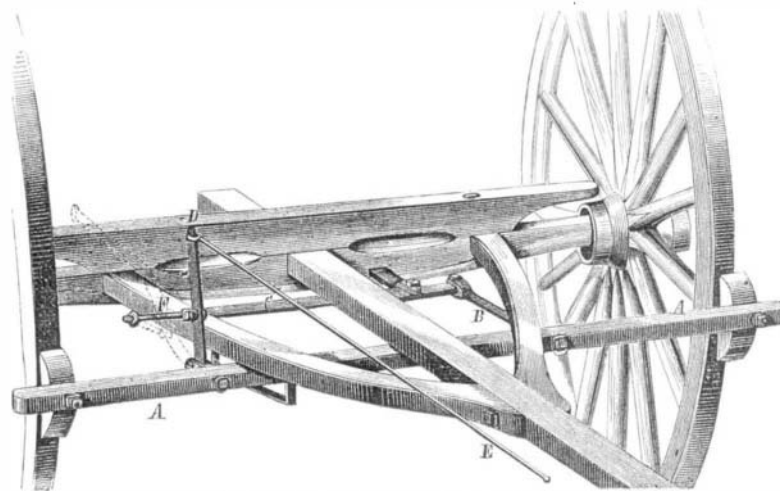
The Knoxville Cave.

Evidences multiply to show that Knoxville, Tenn., is built over an immense cave. The *Chronicle* of that city says that, in digging cisterns at the hotels, "the bottom fell out," and what were intended for cisterns made excellent sewers. Similar results followed excavations on other premises. The other day a public cistern, designed to hold 3,500 barrels of water, had been completed; and seven feet of water had been measured, but it had all disappeared. Further investigation showed that part of the bottom had fallen in, and the water had run off somewhere into the interior of the earth.

**PAINTER'S GAGE COCK FOR STEAM BOILERS.**

tuns, and going east generally carry about 7,500 bushels of grain, or from 140,000 to 170,000 feet of lumber.

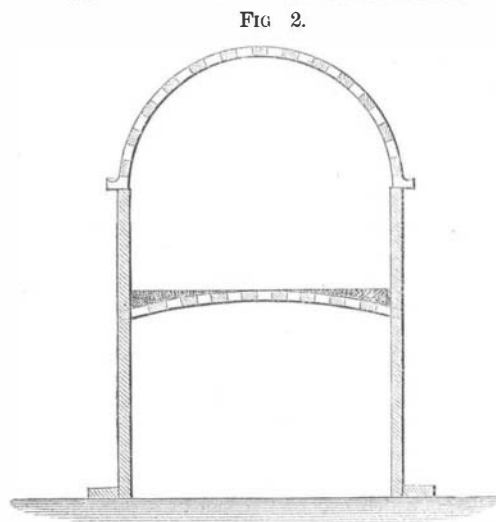
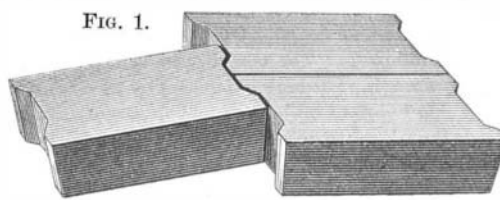
There are no lock fees whatever, the State government including all charges in the State toll of two cents per mile on the boat. Still there are what amount to charges, and it is against these demands that the boatmen call out so loudly. The lock officials will get a boat through in fifteen minutes or be half an hour about it, according to the receipt or refusal of a quarter of a dollar from the captain of the boat. Considering the number of locks on the canal between Buffalo and Albany, these black mailings become quite a serious

**GERHART'S WAGON BRAKE.**

tax, and, when refused, involve a still more serious loss—the loss of time.

QUINBY'S GEOMETRICAL ARCHING BRICKS.

Represented in the accompanying engraving is a new form of bricks for the construction of arches, without the use of



forms, and which, it is claimed, will be of great use in the construction of the bases of concrete bridges, fireproof roofs, etc.