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Cochrane's Mariner's Sound Indicator.

The novel device shown in our engraving, to which the inventor has given the above name, has for its object to enable a mariner to determine the direction of sound, when from any cause he is prevented from exercising the sense of sight. In the specification of his letters patent, he so forcibly sets forth the uses and advantages of the invention that we cannot do better than quote his own language:

"Great inconvenience and many accidents fatal to life and destructive to property, have resulted from the difficulty of determining the direction of sound in navigation; for instance, when, in approaching or navigating harbors or rivers, many vessels, moving in different directions, are enveloped in a thick fog, sound is resorted to as a means of signaling to prevent collisions, and also to enable ferry-boats to make out their landings. Under such circumstances every mariner is aware of the extreme difficulty and inconvenience at present experienced in determining from what locality the sound originates. It would be impossible for me (fifty years a mariner) to cite the numerous instances where difficulties of this kind have rendered the position hazardous and frightful in the extreme.

"My invention proposes to obviate measurably these difficulties, by enabling the pilot (or other person whose duty it may be) to determine, if possible, without leaving his station, from what locality the sound originates.

"I accomplish this by means of tubes—one stationary, with an opening convenient to the pilot's ear, and another forming a continuation of the first, movable to all points of the compass, by means of a wheel or lever under the mariner's immediate touch and control."

The person desiring to ascertain the point from which the sound proceeds, turns the tube, by means of a wheel or lever, until the greatest intensity of sound through the opening in the fixed tube indicates that the bell of the movable tube points in the direction of the source of the sound. Then, by observing any suitable indicator (as the king-spike in the wheel), which, being previously adjusted, shows the direction to which the opening of the movable tube points, the pilot is enabled to steer in the manner indicated by the signal, the sense of feeling even being a guide in case all artificial light should be extinguished, and the vessel should be groping in the dark.

The engraving completes the story of the design of this invention. It is shown attached to the roof of the pilot-house of a vessel, and its parts and use are so well delineated by the skilled hand of an artist as to need no detailed description. The inventor has, however, claimed in his patent the general principle of the combination, and does not confine himself to the particular construction shown.

Patented, Jan. 10, 1871, by James Cochrane, whom address for further information 64 West Tenth street, New York.

Purifying Gas and Soap Limes.

Mr. Thomas Prideaux, of Sheffield, Eng., has, according to the New York *Mercantile Journal*, invented and patented a process for purifying gas and soap limes, which, it is well known, are so exceedingly offensive in smell as to render their proper disposal, when spent, a matter of difficulty.

In Mr. Prideaux's process, the gas lime is thoroughly incorporated with the substances formed in the passage of the gas through the lime, and with that portion of the lime which yet remains in the caustic state. This is done by grinding the gas lime in a mortar mill, or other suitable machine, the lime either being ground dry, or, in some cases, having some water added. By this means the offensive sulphides are oxidized, and the mixture produced obtains the property of hardening in a short time, so that it can be used alone, either for plaster, concrete, or cement, or for building blocks. The specification further sets forth that iron scale and coloring

matters are also used when required for decorative purposes.

By the forementioned treatment it is found that the sulphides and other offensive compounds are so much oxidized that the prepared gas lime can be used for the interior work or decoration of dwelling houses. The substance upon hardening is quite free from unpleasant smell, and is of a light-gray color. If the proportions of lime remaining in a caustic state be insufficient, a suitable quantity of quicklime is added when using the prepared gas lime for the formation of blocks, or for cement, plaster or mortar.

When this substance is calcined and pulverized, it may be kept and used as cement, by mixing with water. The cement

made in the form of tongs, one handle of which has a pivoted ratchet bar, engaging with a pin in the other handle, constitute the instrument. The extremity of the lower handle is bent downward as shown, and terminates in a foot plate which rests upon the ground when in use. The instrument is the invention of P. H. Collins, Philadelphia, Pa.

Something about Skates.

Prof. A. Dembinsky writes to the *Mechanics' Magazine* as follows:

"Fifty years of practice has enabled me to detect all those defects in skates by which the performer is inconvenienced,

or prevented from executing those artistic displays of movement which require the acquisition of bodily balance, and elasticity in the various supporting parts of the skates during evolution. Among other faulty or objectionable constructions of skates, I beg leave to mention here the unproportionate height of the steel blade, by which often the spraining of the ankle, premature fatigue, and temporary spasmodic contraction or dilatation of the sinews and muscles, are caused. The great vibration of the blade, subject to sudden changes of motion, causes a break in the balance of the body, and is sure to cause heavy falls, the more so when there exists a curvature of the blade instead of a straight, uniform shape, which allows motion in the center without being elevated in form, and which motion ought principally to be performed and supported by the part of the fixed heel provided with a screw, which fastens not merely the blade, but secures the fixing of the heel of the boot by the spike-formed head of the screw. All balancing power of the body ought to find its support on the frame, and prevent any fall backward, by which concussions of the brain are frequently caused. The height of the blade depends entirely on the side-balancing or bending of the skater's body, and therefore must be in pro-

portion to the side extension of the foot-plate, so that the surface of the ice cannot be touched by the wooden plate, which would cause a sudden stop of the gliding blade.

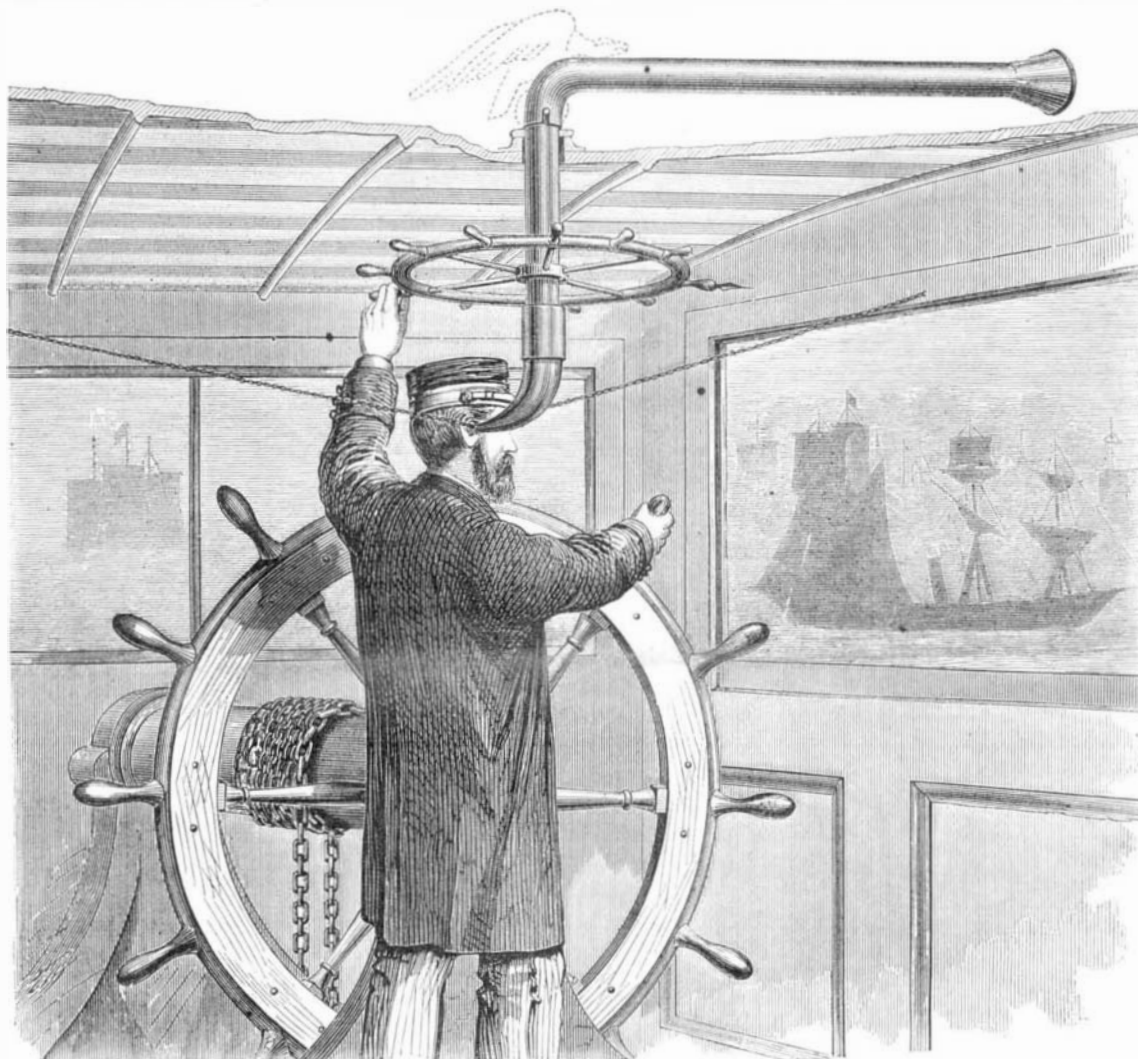
"All forms of metal skates on boots increase fatigue, and cause an unsteady footing during thawing temperature, and any fastenings for securing the toes by metallic bands provided with buckles, are not merely chilling to the compressed toes, and thus becoming inconvenient, but are from their pressure and prevention of the free circulation of the blood, the cause of frost-bitten toes, and also most painful to skaters who suffer from corns or bunions.

"I am fully convinced that any so-called improvement of skates, by the application of more metallic parts than hitherto in use, is rather an evil instead of a benefit to the skater, because it increases the weight of the skate, and thus fatigues prematurely, without increasing whatever the security against any ordinary accident.

"By experience I have found that the most suitable skates are those of the original simple form, provided with a steel blade, having a sharp incision, or groove, which reaches or extends to its ends, and without having any projecting neck or head, and fastened to the boot by a single leather strap, with two buckles, one to form a sling or noose, for the toes, passing through three holes of the wooden supporting sole, the other buckle reaching exactly that part of the boot containing the elastic jointure of the ankle. This strap must carefully be secured at the first hole of the sole or support, by means of wooden pegs, so that no shifting or dislocation of the strap at the toes can take place."

[Had the writer of the above been introduced to some of the improved American skates, we think he would have changed his views on metallic fastenings.—Eps. Sci. Am.]

OSWEGO manufactures annually from 600,000 to 700,000 barrels of flour, and 10,000 pounds of starch.

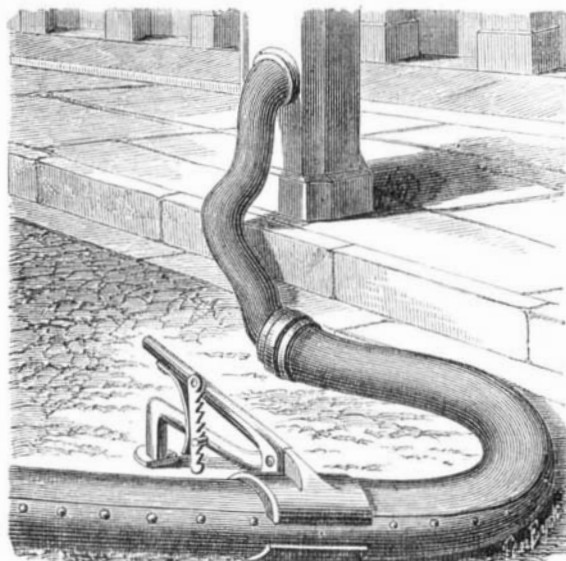


COCHRANE'S MARINER'S SOUND INDICATOR.

is claimed to set hard in a very short time, and to be very strong, and suitable for all purposes to which good water cement is applicable.

DEVICE FOR CLOSING RUPTURES IN FIRE HOSE.

Our engraving shows a useful and simple device by which a rupture in a fire hose may be temporarily closed without



turning off the water. Such an instrument would often be of great use, saving time in uncoupling and coupling on new lengths of hose in cases where loss of time might result in great damage. Our artist has shown the form of the device so well that it almost tells its own story. Two pivoted clamps