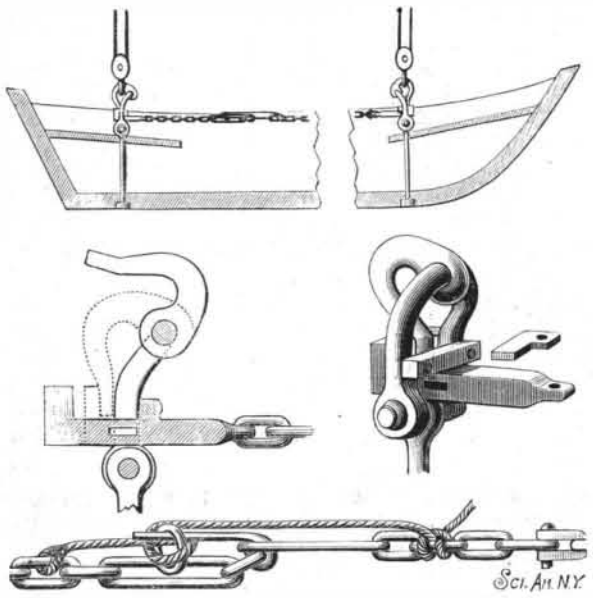
AN IMPROVED BOAT DETACHING APPARATUS.

An apparatus which can be adapted to a boat in any position on the side, quarter, or stern of a vessel, for detaching boats to be launched, and for again reattaching them to the hoisting tackle, is illustrated herewith, and has been patented by Lieut. Alexander McCrackin, U. S. navy, steamship Pinta, Sitka, Alaska. Arranged for connection with a hoisting sling, a shackle is employed which carries a loose hook that is mounted to turn upon the bow of the shackle, the hook having a straight point or end that fits into a keeper formed

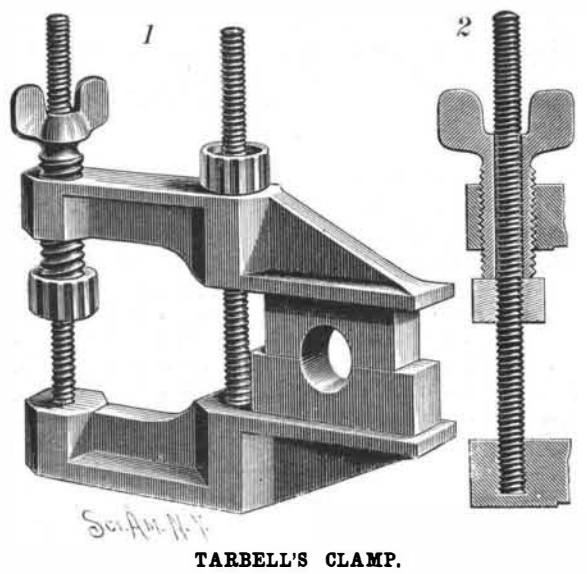


McCRACKIN'S BOAT DETACHING APPARATUS.

upon a sliding bar or bolt, which passes beneath a transverse bar secured to the arms of the shackle. A key is arranged to fit within an aperture of the sliding bar or bolt, by which the latter may be locked to place upon the shackle to hold the hook in closed position. Two such devices are employed, connected by a small chain or its equivalent, made in two parts, joined by a slip hook of novel construction, the arrangement being such that when two sections of the chain are connected by the slip hook, and the chain is drawn taut, the two bars or bolts will be held in position, and prevented from slipping outward to release the hooks turning on the bows of the shackles. When a boat is to be lowered and detached, the lanyard used in connection with the slip hook is cast off, and, the keys locking the sliding bars in the arms of the shackles having been previously removed, the weight of the boat and crew will turn the hooks to allow the boat to drop freely into the water, both hooks being released instantly and simultaneously, and their connecting chain dropping harmlessly on the thwarts, out of the way of the masts and oars.

AN IMPROVED CLAMP.

A hand clamp in which there are no projections from outside the fixed jaw to be in the way, and in which there is no twisting strain on the screw rods, enabling them to withstand the strain of heavier work, has been patented by Mr. Wendell P. Tarbell, of Milford, N. H., and is illustrated herewith, Fig. 2 showing a vertical section on the line of the inner screw rod of the clamp.



TARBELL'S CLAMP.

Two screw-threaded rods are socketed in the fixed jaw of the clamp, the movable jaw moving freely on these rods, on each of which a thumb nut is mounted, on the outer rod above and on the inner rod below the movable jaw. The inner screw rod also passes freely through a hollow screw with an operating thumb nut mounted in a screw-threaded socket piece of the movable jaw. The hollow screw is formed with a pitch differing from that on the rod, so that the screw will travel faster or slower than the thumb nut on the same rod, giving a differential movement between it and the nut, affording a greatly increased leverage. With the parts in position as shown in Fig. 1, the article to be clamped being between the jaws, the thumb nut on the outer rod is first screwed down against the movable jaw and the thumb nut on the inner rod is moved up against the end of the hollow screw. The jaw can then be tightened by operating the hollow screw by its thumb nut, which causes the nut bearing against its end to be turned by frictional contact, forcing the hollow screw upward, and exerting a lever action upon the movable jaw, causing it to tilt on the rod, and further tighten the clamp made between the jaws. In a modified form of this device a friction lever is used in place of the hollow screw to tighten the nut. Any desired clamping power can be had from this construction without the use of a wrench or other outside appliance.

A Smoke Filter.

There was recently an exhibition, on a piece of land adjoining Victoria Mansions, of Loeb's appliances which are designed to enable the wearer to breathe and work with comfort in dense smoke, and also in poisonous gases. The device consists of a respirator with an india-rubber mouthpiece. The respirator is held by two projections, which are grasped between the teeth and a flange which lies between the teeth and the lips, additional security being provided by an elastic band passing round the head. The air is drawn in by the wearer through a series of small filters, containing respectively wet sponge, cotton wool, cotton wool damped with glycerine, and animal charcoal.

These filters are very lightly packed, so that there is no resistance to the act of inspiration, and they are provided with valves which direct the air expired from the lungs into the external atmosphere. The entire apparatus weighs less than a pound, and can be used without previous practice. When it is to be employed in an atmosphere which is deadly in its character, as in the choke damp of mines, the air is drawn from some place where it is pure through a light india-rubber tube. The filter is then strapped to the waist of the wearer, and the respirator merely contains the valves which cause the air to be drawn through the pipe and then to expire into the atmosphere. A tube up to 100 feet in length can be manufactured with facility. Protection is afforded to the eyes by a pair of spectacles with india-rubber rims, which press tightly on the cheek and brow, and exclude all smoke. Mechanical wipers are added to enable the glasses to be cleaned without removal.

At a recent trial in London, says *Engineering*, a man wearing the respirator spent half an hour in a building filled with dense smoke of a most pungent character, without any difficulty, and afterward the inventor's representative, with the aid of a flexible air pipe, entered a room containing a dish of burning sulphur and remained there some time. It was clearly demonstrated that the respirator would enable the wearer to enter a building filled with smoke and discover the exact position of a fire. A few buckets of water promptly applied under such circumstances will do more good than the jet from a steam fire engine directed at random. On board ship, where the result of a fire is to fill the hold with smoke, this respirator would be most useful, and this fact has been recognized in the German navy, where Loeb's respirators form part of the official equipment. Many of the German fire brigades have also adopted them.

Constant Pressure when Distilling under Reduced Pressure.

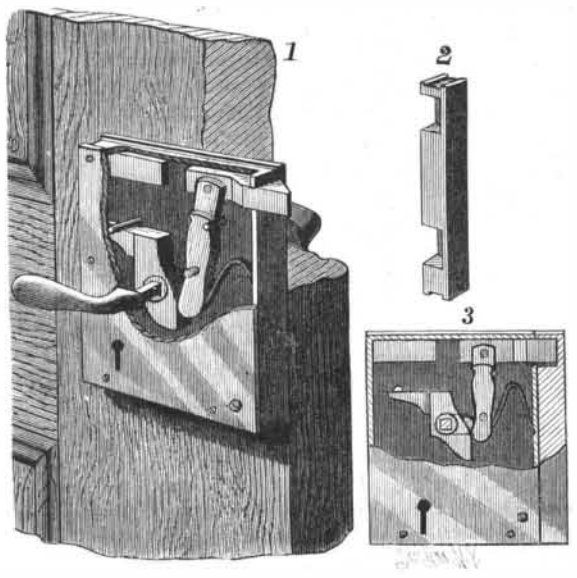
The essential parts of the apparatus are a barometer tube in connection with the exhausted apparatus, and a valve through which air is admitted when, by the action of the pump, pressure becomes reduced below the prescribed point. A copper rod armed with a platinum point passes through the upper end of the barometer tube, and can be adjusted at any desired height. So soon as the mercury rises and touches the point of the rod, an electric circuit is completed and the valve is raised and air admitted. The valve is a glass sphere in a glass seating, the sphere being suspended from the armature of an electro-magnet. The sphere has a weight attached to it, which causes it at once to fall back when the circuit is broken. Even under a pressure of 60 mm.—the lowest obtained with the water pump used—the apparatus renders it possible to maintain the pressure constant to within a millimeter.—*W. H. Perkin, F.R.S.*

For Swollen Feet.

Policemen, mail carriers, and others whose occupation keeps them on their feet a great deal, often are troubled with chafed, sore and blistered feet, especially in extremely hot weather, no matter how comfortably their shoes may fit. A powder is used in the German army for sifting into the shoes and stockings of the foot soldiers, called "Fusstreupulver," and consists of 3 parts salicylic acid, 10 parts starch and 87 parts pulverized soapstone. It keeps the feet dry, prevents chafing and rapidly heals sore spots. Finely pulverized soapstone alone is very good.

AN IMPROVED DOOR LATCH.

A door latch so arranged within an ordinary lock casing that the latch bolt may be easily operated by handles, so placed that the action of pushing down the handle is such as to cause the door at the same time to be pulled open as soon as the latch is disengaged from the keeper, is illustrated herewith, and has been patented by Mr. Latimer S. Shelly, of Steelton, Pa. A dog is mounted on the spindle to which the handles are attached, having an angular projection at one end adapted to bear against a stop pin projecting

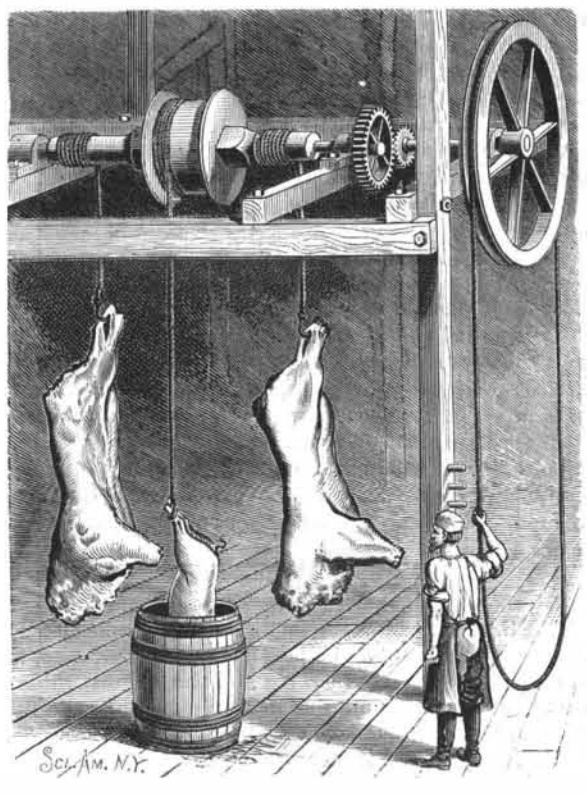


SHELLY'S DOOR LATCH.

from the side of the casing to limit the movement of the dog. The lower end of a lever pivoted to the side of the casing is held to bear against the lower end of the dog by a spring, there being a stop pin secured to the casing which limits the return movement of the lever, to the upper end of which a sliding latch bolt is pivotally connected. Fig. 3 represents a perspective view of the keeper containing the recess for receiving the latch and also one for the regular locking bolt.

AN IMPROVED SLAUGHTER HOUSE HOIST.

A hoist in which the weight of a heavy animal is employed for raising the weight of a lighter animal is illustrated herewith, and has been patented by Mr. Jules H. Tardy, of Glencoe, Minn. It is made with drums of two diameters, the smaller to be usually employed for raising the heavier animals, and the larger for raising the lighter ones, the ropes or chains on the large and small drums being wound oppositely with respect to each other. The windlass shaft is operated by a pinion on another shaft, which carries a grooved



TARDY'S SLAUGHTER HOUSE HOIST.

wheel for receiving an endless rope employed in working the hoist, this rope being held to prevent movement of the load by introducing it between parallel pins projecting from the framework of the hoist. When large and small animals are to be killed, by the using of the larger drum for raising the smaller and the smaller drums for raising the larger, whereby, in the various manipulations, the weight of one animal is made to counterbalance that of the other, the work is rendered lighter and the different operations facilitated.

Culverts and Bridges.

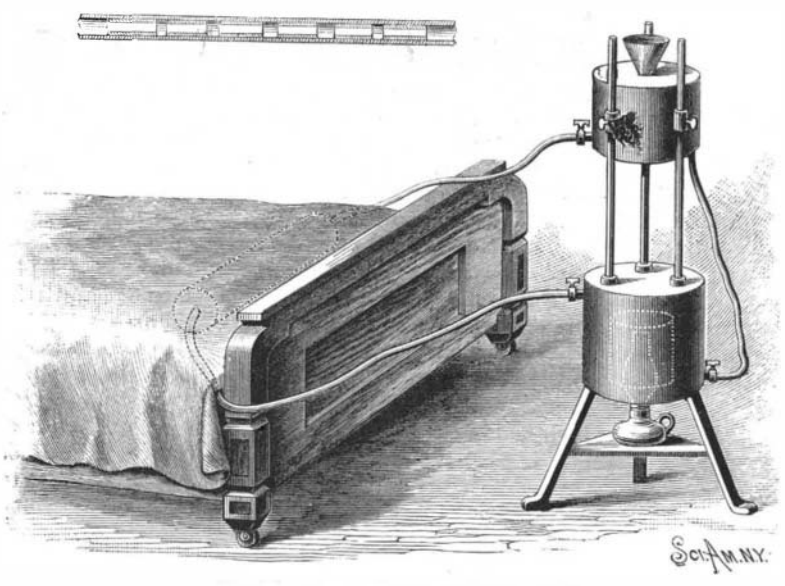
From data furnished by Mr. D. J. Whittemore, chief engineer of the Chicago, Milwaukee & St. Paul system (which had a total length of 5,688 miles on January 1, 1888), the length of open bridges on these lines was 115 91-100 miles, and of culverts covered over with embankment 39 2-10 miles. "Everything," says Mr. Whittemore, "not covered with earth, except cattle guards, be the span 10 or 400 feet, is called a bridge. Everything covered with earth is called a culvert. Wherever we are far removed from suitable quarries, we build a wooden culvert in preference to a pile bridge, if we can get six inches of filling over it. These culverts are built of roughly squared logs, and are large enough to draw an iron pipe through them of sufficient diameter to take care of the water. We do this because we believe we lessen the liability to accident, and that the culvert can be maintained, after decay has begun, much longer than a piled bridge with stringers to carry the track. Had we good quarries along our line, stone would be cheaper. Many thousands of dollars have been spent by this company in building masonry that, after 20 or 25 years, shows such signs of disintegration that we confine masonry work now only to stone that we can procure from certain quarries known to be good."

A Well of Vinegar.

A dispatch from Vincennes, Ind., says: "The mysterious vinegar well which was dug on the farm of S. W. Williams, just east of this city, has been accounted for, after much discussion by chemists and others. Some twenty years ago the farm was owned by F. M. Fay, who had an extensive orchard. The apple crop was large, and he made several hundred barrels of cider, to be converted into vinegar. While the fluid was fermenting, about one hundred barrels burst and their contents were lost. The cider sank into the ground until it reached an impervious strata of clay, where it lay until the well was dug on the same spot."

AN IMPROVED FOOT WARMER FOR BEDS.

A foot-warming apparatus designed to circulate warm water through a chamber or casing disposed at the foot of the bed, and intended to be wrapped with woolen or other cloth, is illustrated herewith, and has been patented by Mr. James A. Lewis, of St. Clairsville, Ohio. Three separate receptacles or liquid tanks are employed —a receiving tank, a heating vessel, and a foot warmer, the receiving tank resting above and supported from the heating vessel by guide clasps embracing vertical rods. From the receiving tank a hose or other suitable flexible conduit passes to the lower part of the heating vessel, from near the top of which a similar conduit passes to one end of the foot warmer, another hose connection passing from its opposite end to the supply tank, whereby a free flow and circulation is secured between the receptacles. If desired, check valves may be employed whereby the heated water will always pass in the direction from the heater to the foot warmer, etc., and be prevented from any return flow. The flexible conduits, near their connections with the foot warmer casing, have short internal re-enforcing tubular sections, as shown in the small figure, so that the pressure of the bed clothing will not prevent or retard the circulation of the heated water. The funnel-shaped outer passage into the receiving tank is closed by a removable ball valve or spherical stopper. It is designed that the lamp by which the water is heated shall have a chimney of metal or opaque material, that the room may not be lighted.

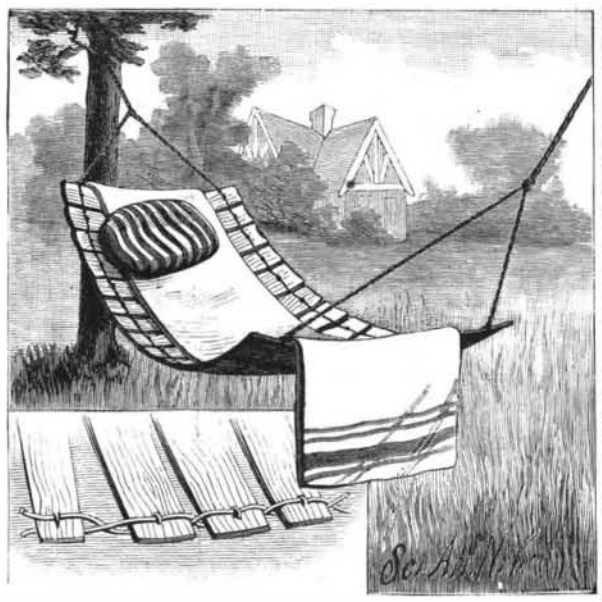


LEWIS' FOOT WARMER FOR BEDS.

Fabric and Fibre mentions an electric picking motion for looms, which is to do away with all the present mechanism called a picking motion. Should this prove true, and there is no reason why it should not, it will cause a revolution, and greatly simplify the loom.

A BARREL STAVE HAMMOCK.

We illustrate in the cut a simple method of constructing a hammock. But little explanation is required, as, owing to the simplicity, the illustration explains itself. The material used includes a number of barrel staves and some rope. The latter should be about one-half inch in diameter. It should be doubled and loosely twisted. Then a second doubling without twisting leaves it in condition for the introduction of the staves.



A BARREL STAVE HAMMOCK.

These are taken from ordinary flour barrels. Two such barrels give material for a good sized hammock. Near each end of each one of the staves a hole about one-quarter inch in diameter is bored. The ends of the staves are then inserted, as shown, in the lays of rope, between the two pieces on each side. The object of the loose twisting is to provide places for the introduction of the ends of the staves. Care must be taken to have enough twists to receive all the staves, and not to have the twisting too tight.

If preferred, the ropes may be twisted as the staves are introduced. This gives a more certain method of securing the desired mean between tight and loose twisting.

To prevent the staves from slipping out, each one is tied in place. A short piece of string is wound at each end of the stave around both ropes, passing through the hole already mentioned, and is then tied. The ends of the suspension ropes are now secured and tied or spliced into loops, and the hammock is complete.

The staves may be used of their original width, or may be split. Probably the most generally satisfactory method is not to split them. The weak point in the construction is the liability of the staves to bend and pull out of place. This, of course, is more liable to happen with split ones, which are of but one-half the normal strength.

When such a hammock is provided with a heavy rug and pillow, it surpasses in comfort the ordinary type. It can be made in a half hour, and we believe that the half hour will generally be considered well spent by the maker. Various other methods of securing the staves may suggest themselves, but the above is given as a simple and effective form.

Lightning Rods.

Some useful particulars are given in Professor Oliver J. Lodge's lectures on the "Protection of Buildings from Lightning," delivered at the Society of Arts. Referring to the tape and rod forms of conductors, it is pointed out that Faraday maintained that sectional area was the one thing necessary, and that shape was wholly indifferent; on the other hand, Sir W. Snow Harris considered that tube conductors were just as good as solid rods, and that flattened ribbon was better still. Faraday was thinking of nothing but conduction for steady currents, Harris was guided by experience. The lecturer thinks that Harris was right, and to prove this point he gives results of experiments made upon two conductors of copper of the same weight, but one in the form of wire, the other in the form of a ribbon, by which it is shown that the flattened form of conductor has the advantage over a mere round section for carrying off a charge, and with least liability to side-flash. As to the deflagration of the conductor, Mr. Preece has found that ribbon and wire are equally easy to be destroyed by a flash. Experiments have also shown that straight conductors have a tendency to side-flash, however thick they may be. No conductor, Professor Lodge says, is able to prevent it altogether, unless it is zigzagged to and fro, in which case it is found to have practically no self-induction, and side spark is nearly stopped.

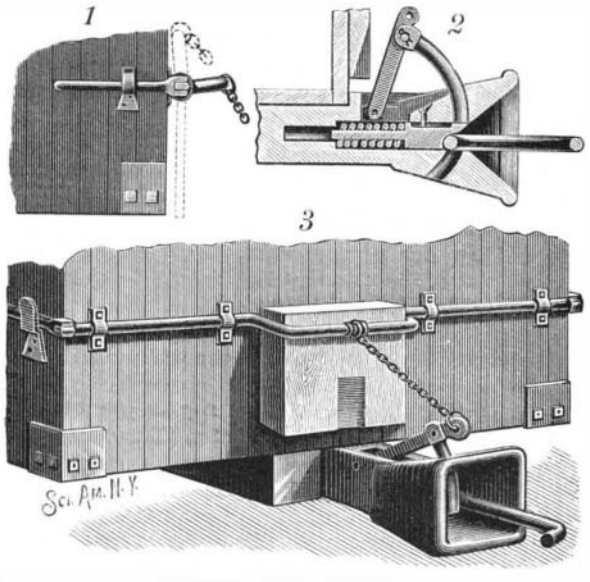
It must also be remembered that a rod of iron carries off a discharge better than a rod of copper. The discharge probably penetrates iron deeper than it does copper. Its inferior conductivity is considered even an advantage in rendering the flash slower and less dangerous. When galvanized, it can be made almost as durable as copper, and its liability to get magnetized is no objection. Prof. Lodge thinks the use of copper for lightning conductors is doomed. The lectures are full of interest for the architect. The liability of objects to be struck is shown to depend upon certain conditions—for example, whether the flash occurs from an already charged surface which has strained the air close to bursting point, or whether the flash is produced by a rush of electricity into a previously uncharged conductor too hastily for it to prepare any chosen path. These are considered, and the results of experiments given.

To Build a Chimney.

To build a chimney that will draw forever and not fill up with soot, you must build it large enough—sixteen inches square; use good brick, and clay instead of lime up to the comb; plaster it inside with clay mixed with salt; for chimney tops use the very best of brick, wet them and lay them in cement mortar. The chimney should not be built tight to beams and rafters; there is where the cracks in your chimneys come, and where most of the fires originate, as the chimney sometimes gets red hot. A chimney built from cellar up is better and less dangerous than one hung on the wall. Don't get your stovepipe hole too close to the ceiling—eighteen inches from it.

AN IMPROVED CAR COUPLING.

A coupling designed to be operated without requiring trainmen to go between the cars, and which permits of cars provided with it being also coupled with those having the ordinary link and pin drawhead, has been patented by Mr. Francis L. McNab, and is illustrated herewith. At the back end of the link socket of the drawhead is a shoulder limiting the inward movement of the link, and behind this socket is a longitudinal recess, prolonged inward by a bore, receiving a trip block and its stem, the latter surrounded by a spiral spring, as shown in Fig. 2. The forward end of the trip block is rabbeted out transversely at its lower part to provide a recess to receive the inner end of the coupling link, which thus rests beneath a tongue or lip of the block, and is held up at its outer end prior to coupling to another car, the lip also serving as a support to the curved coupling pin. The latter is pivotally connected to a pivoted drop bar, whose outer end is connected by a chain to the central cranked part of a shaft journaled across the end of the car body and provided at its outer end with crank arms, hinged to the ends of the shaft, so that when the shaft is turned to lower the coupling pin to couple two cars, the arms may be placed in latch hook supports fixed to the car body, and when lifted or disengaged from the latches the arms will swing down at the side, as shown in dotted lines in Fig. 1, the weight of the pendent arms then being sufficient to hold the coupling up to prevent coupling while shunting the cars, etc.



McNAB'S CAR COUPLING.

For further particulars with reference to this invention address the inventor, or Mr. James Playfair, Sturgeon Bay, Ontario, Canada.

THE Rosedale, an iron ocean-going steamer, has been the first to make the passage between London and Chicago, proceeding up the St. Lawrence and through the ship canal to the lakes. Though a certain amount of her cargo had to be removed to permit her to pass through the St. Lawrence Canal, yet the vessel was still drawing 14 feet on her arrival at Chicago.