

THE LAUNCH OF THE CAISSONS RECENTLY BUILT AT THE NORFOLK NAVY YARD.

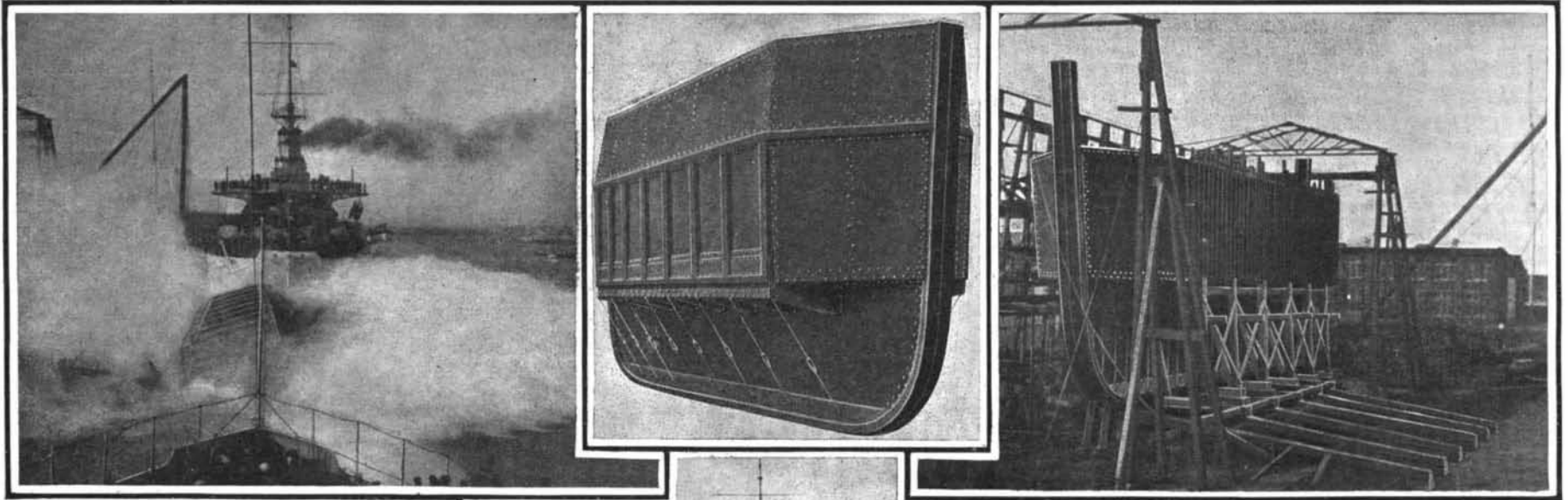
BY E. C. HAMNER, JR., ASSISTANT NAVAL CONSTRUCTOR, U. S. N.

The caissons recently completed for the drydocks at Charleston, S. C., and Norfolk, Va., differ from the

have been as difficult as to build ways for an end-on launching.

The ground ways, which were temporary, were carried out over the sea wall for a distance of about 13 feet, and the height of the sea wall above the

angle of nearly 90 deg., i. e., that the side of the caisson would strike almost flat. To protect the side plating, which was 20-pound plating, there were nailed along the side white oak planks 6 inches by 12 inches, spaced about one foot apart. The accompanying pic-



The Launch.

old ship-shaped caissons in several particulars.

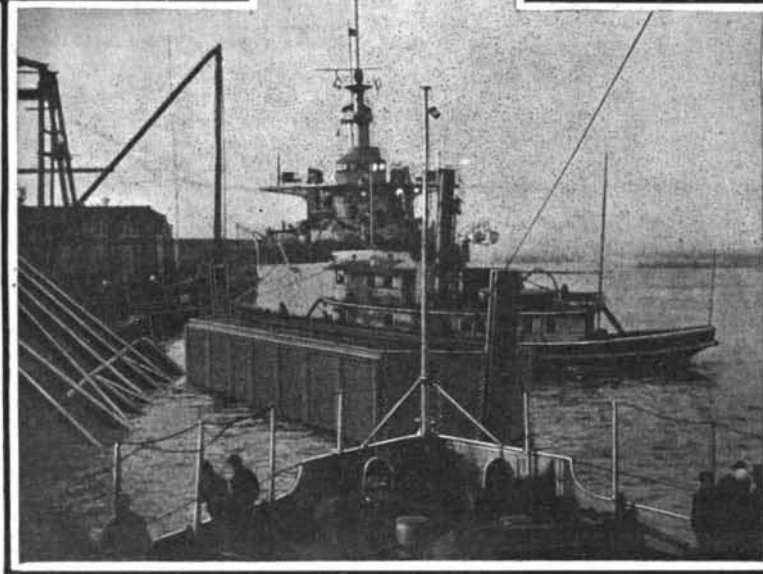
A section of the caisson built in 1892 for the stone dock at the Norfolk navy yard, which is the general type of caisson now in use in nearly all docks, is essentially boat-shaped, and built up from the keel, with frames and plates leaving tanks inside for flooding.

The new caisson, as shown by section, consists of a box with parallel sides tapering toward the ends, and a flat bottom, under which projects a deep fin keel, which is stiffened on each side by I beams, and also by tie rods fitted with turnbuckles which connect the bottom of the keel to the outer edge of the overhang of the box. The plating of the keel is 30 and 40 pound plate, and of the upper body 20 and 17½ pound plate; the material throughout being of mild steel.

One caisson is provided with ten 24-inch gate valves, and the other with twelve 22-inch gate valves, for flooding the dock; these valves are both hand and electrically operated, each valve being operated by a small induction motor, the induction motors being operated from a common starting panel. For pumping out the ballast tanks a centrifugal pump with 15-inch suction is provided; this pump is also driven by an induction motor.

The dimensions of these caissons are approximately: Length, 114 feet; beam, 20 feet; depth at center, 42 feet; draft, light, 26 feet; draft with ballast tanks filled, 36 feet; displacement, 1,050 tons.

Besides the departure from the conventional ship form of floating caisson, the most interesting feature was the peculiar means of launching. There was available at the Norfolk navy yard the old launching slip used for the "Texas" and "Raleigh." In order to use this, however, it would have been necessary to extend the ground ways to a great distance into the stream, on account of the great draft of the caissons in the launching condition, which was 23 feet 7 inches. This was objectionable, not only on account of the cost involved, but because it would have interfered with navigation in the narrow channel opposite the yard. It was consequently determined to launch the caisson broadside on. This method is regularly employed on the Great Lakes, but there the ground ways are carried out far enough for the ship to become water-borne before leaving the ways. To have built such ways would



After the Launch.

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level of the water was about 7 feet. The ground ways were not secured to the ground, and when the caisson reached the edge of the wall, the inner end of the ground ways rose, tilting the caisson. The caisson itself was carried on a cradle resting on six sliding ways; this cradle was weighted so as to sink clear of the caisson, as were also the outboard ends of the ground ways.

From tests made on a model in the tank, it was expected that the caisson would strike the water at an

On the Ways.

tures show the caisson before, during, and after launching; the one showing her taking the water gives a good idea of the tilting effect of the ground ways.

THE COLD STORAGE OF FURS.

It is reasonable to suppose that any set of conditions under which furs naturally thrive, would if successfully reproduced offer the best means for preserving them. That is the principle adopted for the modern storage of furs as exemplified by the dry-air cold storage method.

Furs are finest, glossiest, thickest, and best in the coldest climates. The most valuable pelts come from the Arctic or sub-Arctic regions, and hence, to retain their natural brilliance, they should be kept, as far as possible, during their summer period of rest, in a temperature equivalent to that of their native land. Where such conditions prevail, the natural oils of the skins are preserved, instead of drying out in the summer heat of the average storehouse. Again, in cold storage damage by moths is absolutely prevented. Freezing benumbs the larvæ and renders them harmless for the time being. Preliminary precautions are of course taken thoroughly to clean the furs before storing them. It was with these facts in view that the new fur storage plant was planned. Existing plants were carefully studied and the shortcomings they developed were avoided.

The plant occupies a space 80 x 120 feet, extending from the eleventh to the thirteenth floors of the Wanamaker building. The walls, which are 24 inches thick, are composed of cork and fireproof materials and absolutely exclude the heat of the outside air. Entering the storage vault through a series of air-locks which are protected by doors built on the principle of those used on refrigerators, the observer is struck by its whiteness, airiness and lightness.

No wood is used in the floors, walls, or ceilings, concrete and steel being the only materials. The floors of the upper tiers of the vault are formed of iron gratings, like those in the engine room of an ocean liner. All the iron cross-pieces from which the hangers for the garments are attached are removable and can be arranged to suit the number and length of the articles to be stored.

The ground floor of the vault is equipped with about 4,000 spindles projecting horizontally from uprights, giving storage



SCENE IN A COLD STORAGE ROOM FOR THE PRESERVATION OF FURS.

room to nearly 8,000 muffs or the various pieces composing fur sets. On the floor of the open court in the center are platforms for the storing of mounted animal rugs—and a remarkably fine collection of wild beasts are now convened there. The three upper tiers have provisions for storing upward of 50,000 fur coats, wraps, lap-ropes, etc. Sprinklers arranged on the dry-pipe system afford protection in case of fire.

The system of refrigeration represents the very latest in the art. No brine pipes enter the vault, thus avoiding the danger of damp, mildew, or a downright soaking with salt water, all fatal to a fine garment. A powerful ice machine, producing in cold the equivalent of 100 tons of ice daily, is located in the sub-basement of the building. This cools the brine to a temperature of 8 deg. above zero, and after the brine is pumped to the thirteenth floor it passes through a coil containing several thousand feet of iron pipe, where a powerful blower drives a steady current of fresh air over it. The extreme cold freezes all the dampness out of the air, which then enters the cold storage vault through openings in the roof, whence it circulates slowly through the whole room and is drawn off by outlets through the floor of the vault.

The air thus deprived of much of its cold is led back to the cold-pipe chamber, where it is again reduced to the proper temperature and starts on its journey once more. This constant circulation of cold, dustless, dry air maintains a temperature of 20 to 30 deg. above zero in the storage vault. Of equal interest to the customer is the manner in which the articles are identified and withdrawn when wanted. When furs are brought in for storage all pieces in each lot are tagged with the same number. A receipt is filled out in triplicate with the owner's name and address, date, valuation

and description of the articles. One copy is sent to the customer and the other two are filed.

Insects That Destroy Metal.

The astonishing fact that in the Vienna mint the leaden walls of a reservoir containing sulphuric acid, although 43 millimeters, or about 1.7 inches thick, were eaten through by an insect; that the leaden gas pipe in a café was also damaged in like manner, and that also in the sulphuric acid factory in Nussdorf the wall of the lead chamber was found to contain defects from the same cause, has recently attracted attention to the damages done by insects both to wood and to metal. Such damages are due to a sort of wood wasp, of which there are many sorts in central Europe. The largest of these, the black and yellow giant wood wasp, resembles the true wasp, which is so feared by reason of its sting; but close observation shows it to be very different. Its breast and belly are joined by a wide connecting piece, whereas in the case of the real wasp the "waist" is proverbially small. On the under side of the elongated belly, the female has a very hard boring device, about 19 millimeters ($\frac{3}{4}$ inch) long, black and fluted, and which lies in its sheath. Ordinarily this borer is directed backward; but when in use it is turned about its base, so as to make a considerable angle with the axis of the body, and is used like a rat-tail file until it makes a hole about 18 millimeters (0.7 inch) deep in the wood which it usually chooses to perforate. The egg which the female lays in the wood develops into a caterpillar-like creature with six short legs, and without eyes. (What would it do with eyes? About two years—during almost its entire life—it lives in the wood, in perfect darkness!) With its sharp, hard jaws

it bites in the trunk of the tree tubular channels, which increase in diameter as it grows larger. It swallows the wood which it gnaws off, digesting the nutritious portions and discharging the rest in a meal-like form. For two years it eats its way forward in this manner. In the third year the insect creeps out, biting with its jaws through the thin wall which separates it from the outer world, leaving the home of its childhood to enter upon a short life in freedom.

Should a tree trunk that has been perforated by such a wasp, and in which an egg has been laid, be employed when insufficiently seasoned for building purposes, it may happen that some day the insect, which has been two years working its way through the piece, will suddenly appear in the building.

If a piece of such timber which contains a larva is surrounded by a leaden plate, the insect will not stop at this, but will bite its way through just as though it were of wood.

Almost more wonderful are the performances of the boring cricket. Although this is a dwarf compared with the wasp, it has been able in Rochelle to gnaw through the leaden roof of a building and to make holes 14 mm. (0.55 in.) deep and 4 mm. (0.16 in.) in diameter in printers' stereotype plates, despite the fact that by reason of the antimony in such plates they are much harder than lead.

There are more coke ovens being erected in the Connellsville, Pa., and neighboring regions than have ever been known before in the history of the coke trade. The number in hand and projected is 7,950, and the work on them is only restricted to some extent by the difficulty in obtaining labor.

RECENTLY PATENTED INVENTIONS.
Pertaining to Apparel.

GARMENT-HANGER.—A. M. TAYLOR, Port Ewen, N. Y. The object of the inventor is to provide a hanger more especially designed for the use of ladies, and arranged to conveniently and properly support a coat, a skirt, a plurality of shirt waists and a hat in a very compact form and without danger of crushing or injuring any of the garments, and allowing convenient removal or replacing of any of the articles.

EYEGLASS ATTACHMENT FOR CAPS AND HATS.—J. A. BLACKSTON, Piedmont, W. Va. The inventor has devised an attachment by which the glasses may be secured to a cap visor or hat brim, and out of the way when not in use, or they may be lowered and held in normal vertical position in front of the eyes without touching the nose. The glasses proper may be easily and quickly detached when it is desired to use them independently.

Electrical Devices.

TROLLEY-WHEEL.—W. H. BRADT, Schenectady, N. Y. The invention has reference to certain improvements in trolley construction, whereby there are provided two wheels revolving parallel on the same shaft, the object being to improve the contact of the wheels with the trolley wire to prevent sparking, and to increase the life and efficiency of the apparatus.

Of Interest to Farmers.

IMPLEMENT.—T. M. WALKER, Brister, Ark. This is an improved tool of a construction adapting it as a convenient device for many purposes, such for example, as a grubber, cant-hook, fence-jack, and post-hole-digger. It is particularly useful to the farmers and others who have constant need of such a device.

BRUSH FOR COTTON-GINS.—W. W. ROBINSON, Alexander City, Ala. The brush is intended for use in gins or other machines requiring a revolvable brush of simple construction. The invention resides in a drum or cylinder, on which devices or sticks carrying the bristles of the brush are fixed. The cylinder is composed principally of sheet metal, providing a strong, light and well-balanced structure.

Of General Interest.

RAZOR.—J. F. BAILEY, Valdosta, Ga. In practice, the implement blade will be made very thin and sharp, and can be used either in the right or left hand, and reversed, and the blade when pushed into the body portion will interlock, having the spring wings or tongue which may spread laterally when adjusting into and out of engagement with the projecting portion of the body. It is especially an improvement in what are called safety razors.

HAME-FASTENER.—S. T. MARLETTE, Buffalo, N. Y. This fastener comprises a slotted body having a hame hook at one end, a slidable hame hook projecting from the other end of the body, and having a downwardly curved shank, a lever provided near its free end with a lateral stud and a plate spring secured at one end to the shank of the slidable hook and provided with a hole to receive the stud, its

free end projecting beyond a lever in position for manual access so that it may be pressed laterally for unlocking the lever.

BOTTLE-SEAL.—L. E. HENDRICKSON, Osage City, Kan. This device for use in sealing bottles is designed to prevent the opening of the bottle and dispensing of its contents without first breaking the sealing device. The invention includes under the term bottle, jugs, demijohns, and other containers having necks provided with downwardly facing lip or shoulder for engagement by the tongues of the locks.

PIPE-CLOSURE.—A. A. FISK, Pomona, Cal. This improvement pertains to irrigation pipes, stand pipes, and the like, and its object is to provide a closure arranged to permit of conveniently, quickly, and securely closing the end of a pipe, and to allow of opening the same for making connection with another pipe whenever it is desired to do so.

BLOCK.—P. J. MACDONALD, Bangor, Me. The aim is the provision of a light and easily constructed block which will relieve a load of sudden jerks and shocks as are incident in hoisting, drawing, and landing loads with the usual hoisting block. This is accomplished by forming a yielding connection between the block and the means for suspending or holding it in fixed position.

FIRE SHIELD AND EXTINGUISHER.—S. GERMAN, Monkton, Md. This invention is an improvement in apparatus designed especially for the protection of buildings from fire and for use in extinguishing the fire. In carrying it out the inventor provides in connection with uprights, shield sections extending between the same and preferably made of fireproof material and adapted to protect the structure, upon which it may be used, from fire when an adjacent building is burning.

ENVELOP.—H. C. MURPHY, Marengo, Ind. Envelops of the safety type are improved by this invention. The object is to provide an envelop for the transmission of valuable matter through the mails by express or otherwise and having a novel means of sealing without employing adhesive, and which cannot be fraudulently opened or tampered with without detection.

CYCAS-LEAF HOLDER.—W. N. REED, New York, N. Y. The improvement pertains to means for holding leaves, flowers, and the like, and more particularly for holding cypress leaves in definite position suitable for ornamentation. It admits of general use, but is used especially for the decoration and adornment of caskets, coffins, graves, and the like.

HORSE-BOOT.—M. WEISS, New York, N. Y. One purpose of the invention is to provide a metal boot adapted to be worn over the shoe, and means whereby the boot can be quickly and conveniently applied when needed and as expeditiously and readily removed when not needed. It will prevent slipping when traveling over exceedingly slippery roads, and will not be cumbersome, nor interfere in any manner with the motion of the horse.

SIGHT FOR FIREARMS.—G. B. CRANDALL, Cherry Valley, Ontario, Canada. Loose and inaccurate adjustment has been the result of attempts to secure a rear tang-sight having a wind-gage base. This inventor obtains a rear wind-gage by use of a sight stem having a wind-gage top no more likely to become loose and shaky than an ordinary tang-sight. An ordinary sight can be immediately converted

into a very satisfactory rear wind-gage by the simple use of the extra wind-gage stem. It does away with the high and cumbersome front wind-gage sight and places a wind-gage at the rear, which all who use an arm, prefer.

Hardware.

CAN-OPENER.—J. CODVILLE, Bella Bella, British Columbia, Canada. A shank member has rigidly fixed to it at its outer end a steel plate having means to puncture the can center with a slidable blade on the member adapted to co-operate with the puncturing means in cutting out the top of a round can. In connection with the blade is a guiding means to keep the blade at proper distance from the center. The plate at the end of the shank, in addition to the puncturing means, carries a cutting blade for opening square or irregular cans and a slot for engaging a removable strip as placed on some cans to provide means for their opening.

Railways and Their Accessories.

RAILWAY-TIE.—M. A. GLYNN, Habana, Cuba. In this case the invention pertains to metallic railway ties, and is designed to provide means adapted to be readily connected with railway ties and to hold said rails firmly in position. It is also designed to provide means for cushioning the rails and enabling them to be readily detached from the ties and be replaced when desired.

CAR-FENDER.—F. J. McDONNELL, New Bedford, Mass. The invention refers to car fenders such as are adapted to be carried at the front of a car to prevent persons from being run over. The object is to produce a fender of simple construction which will operate efficiently to catch the body on the track and move the same rearwardly, at the same time tipping downwardly so as to hold the body in a place of safety.

Pertaining to Recreation.

AMUSEMENT DEVICE.—G. E. WILLIAMS, Jersey City, N. J. The device comprises a square board having a flange at its outer edge, and a disk with a slightly concave upper face at its center. From its center the disk is provided with two concentric rows of pins, those of one row being staggered in relation to those of the other and surrounded by divisions alternating in color and of different numerical values. The disk has a rail surrounding its circumference and a bell in its center, the latter having a path leading to it through the pins and adapted to be rung by a marble or other sphere discharged in a novel manner.

BASE-BALL-GAME APPARATUS.—A. H. HEITMANN, Columbus, Ohio. By means of the apparatus an indoor game of ball is played by small dummy players placed upon a board representing a baseball diamond. The object of the invention is to provide means whereby the game may be played with all the rules of an ordinary outdoor game of baseball, and all the realistic effects produced.

PITCHER FOR BASE-BALL-GAME APPARATUS.—A. H. HEITMANN, Columbus, Ohio. This invention relates to improvements in toy base-ball game apparatus, and more particularly to means employed for throwing or pitching the ball; this application being a division of a prior one, filed by Mr. Heitmann. The ob-

ject is to provide means whereby the direction, speed, and distance to which the ball is thrown may be readily controlled, and whereby the greatest possible velocity is secured.

BATTER FOR BASE-BALL-GAME APPARATUS.—A. H. HEITMANN, Columbus, Ohio. The invention refers to improvement in apparatus for playing an indoor game similar to an ordinary game of baseball, and in which small dummy players are manipulated upon a baseball diamond board. This application is a division of a prior application filed by Mr. Heitmann, its object being to provide a batter so constructed that the bat may be swung in any direction, and in the direction in which the ball is batted may be more perfectly controlled.

AMUSEMENT DEVICE.—F. W. THOMPSON, New York, N. Y. The invention relates to improvements in amusement devices formerly granted to Mr. Thompson. The object of the present invention is to provide a construction involving a plurality of downwardly inclined slide-ways discharging into a common slide-way, the slide-ways being preferably contiguous except at a point intermediate their length, where they diverge and again converge before passing to the common slide-way.

Pertaining to Vehicles.

TRACE-CLIP.—C. A. GUNZELMON, Abilene, Kan. The invention refers to trace retaining devices and its object is to provide a clip which is arranged to securely hold the trace in place on the end of the whiffle-tree. To unlatch the trace, the operator presses certain members of the clip to disengage the hooks from the whiffle-tree, and swings the clip upwardly and inwardly to disengage it from the trace and to allow of slipping the latter off of the now free and unobstructed end of the tree.

VEHICLE-WHEEL.—M. G. BABIO, New York, N. Y. The invention refers to improvements in vehicle wheels, or wheels which are particularly adapted for use in connection with automobiles and the like, and primarily to provide such wheels with a novel principle of twin pneumatic tubes. Mr. Babio improves in the present invention upon the construction shown in the patent formerly granted to him, on a wheel for light and for heavy service.

VEHICLE.—M. L. JOHNSON, Galena, Ill. The invention is an improvement in vehicles and particularly in the class of two-wheeled vehicles. The invention gives the horse a mechanical advantage by compounding the leverage of the shaft in making the draft direct from the spring gear and elastic to relieve the vehicle from the horse motion.

Designs.

DESIGN FOR A PLATE.—M. J. MULLINS, New York, N. Y. This ornamental design is for a round plate in the center of which a milkmaid is milking a cow standing in a pasture amid farm scenery.

DESIGN FOR A TEAPOT OR SIMILAR ARTICLE.—L. ROUQUART, New York, N. Y. In this ornamental design the pot stands in graceful proportions, swelling from the top and then gradually sloping to a short flanged base. The body rim on which the lid rests is sex-angled. The handle and spout are plain and tasteful in thin lines.

NOTE.—Copies of any of these patents will be furnished by Munn & Co. for ten cents each. Please state the name of the patentee, title of the invention, and date of this paper.