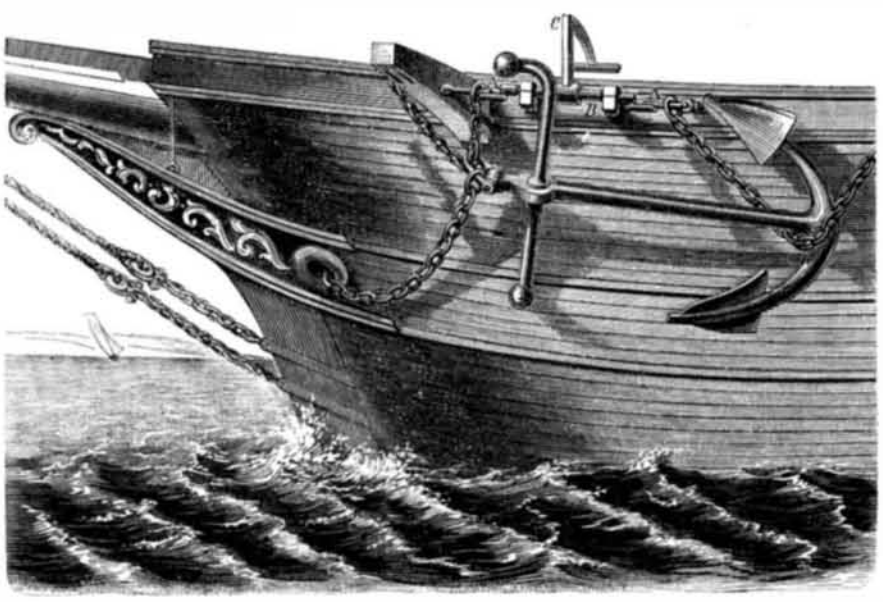
Improved Device for Tripping Anchors.

The ordinary mode of hanging a ship's anchor is by securing its ring near the cathead by a chain called a "ring-stopper," and bringing its flukes well up to the rail by means of a chain called the "shank painter" which passes around the shank of the anchor. The ends of these chains are fastened upon fixed hooks, or their equivalents, and when it becomes necessary to let go the anchor its fluke end is raised and one of the flukes hung on the rail until the end of the painter can be released, when the anchor is swung forward far enough to slacken the ring-stopper and allow one of its ends to be released, when the anchor may be let go. These successive operations require the strength of several men and a good deal of time, at a period when the labors of the men are required elsewhere and the time is of the greatest value.

The object of the anchor tripper seen in the accompanying engraving is to save this labor and time, and permit the anchor to be tripped instantly under all circumstances, which must be of very great value in cases of emergency when the lapse of a few moments may involve the loss of the ship.



HEITMANN'S PATENT ANCHOR TRIPPER.

With this improvement both the ring-stopper and shank-painter are retained, but only one end of each is secured on fixed hooks, the other ends being held on pivoted latches, A, which, when not held in a horizontal position, are allowed to swing freely in a vertical plane. They are thus held by a bar, B, called a "keeper," which is sustained in bearings on brackets projecting from the ship's side. Each end of this keeper is off set and concaved to receive the ends of the latch bars as seen in the engraving. A bent lever, C, is securely fastened to the keeper by which it may be operated from on deck. This lever is represented in the engraving as partly raised so that its form may be seen; but when in its normal position, with the anchor slung, it rests upon the rail. It may be secured here by a catch if desired, but it is so shaped as to render its accidental displacement hardly possible, even without such precaution.

In operation the anchor is brought up to its proper position behind the cathead when the free end of the ring-stopper is passed through its ring and over the latch, A, which is then rested in the concave portion of one end of the keeper. The free end of the shank painter is then passed under the shank and the ring on its end slipped over the other latch, which is placed in the corresponding receptacle at the other end of the keeper. To trip the anchor it it only necessary to raise the lever, C, sufficiently to release the latches, when the anchor descends, held only by the cable through the hawse hole. This simple operation can be performed in an instant by only one man. The advantages of such a device are obvious to all those whose experience on the sea has learned them wisdom. It was patented through the Scientific American Patent Agency by Capt. B. H. Heitmann, who may be addressed at Galveston, Texas, relative to the sale of rights or the disposal of the whole patent.

GOULD'S STOPPLE FOR SODA-WATER BOTTLES.

The design of the device shown in the engraving is to afford a ready means of opening and closing the aperture of soda-water bottles, the stopple being always attached to the

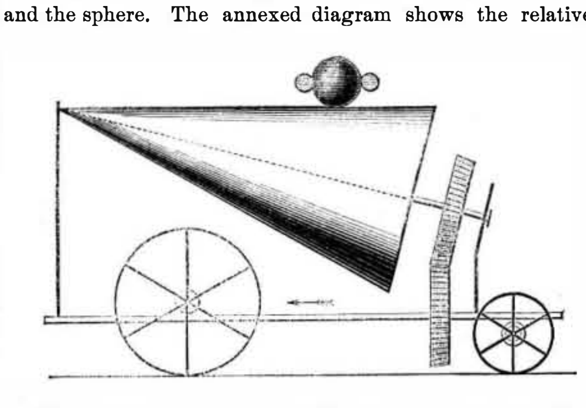
receptacle of the liquid. The stopple is simply a globe of rubber, or of any other elastic substance, turning on an axis passing through its center, the bearings of which are eyelets of metal to prevent wear. Around the neck of the bottle is a coiled spring, a portion of which passes through the sphere that forms the stopple and acts as the axle on which it turns. By the pressure of the thumb on the side of the stopple it can be rolled from its seat and returned, the tension of the spring retaining it accurately on its seat.

With this device there can be no loss of stopples. The enormous waste and consequent expense of corks is a very serious item of cost in securing the mouths of bottles, but in this device is entirely prevented. Patented July 30, 1867, by John H. Gould, Newburyport, Mass., who will reply to all interogatories relative to the improvement.

DYNAMOMETERS AT THE PARIS EXHIBITION.

The friction brake is a very rude instrument for the refinement of modern engineering and machine making. It is a very useful and simple contrivance, and it is adapted to tell approximately how many horse power a water-wheel or a windmill gives out in its action, or how much power is consumed by a millstone or other uniformly rotating mechanism. But when it comes to the investigation of more complex and irregular movements, when such a question arises as what precise point or portion of a curved cam suffers the greatest strain during its revolution, and what proportion this strain bears to that which cams of other shapes or curves will have to undergo if substituted for the first, when it comes to watch and compare the relative consumption of power between different spinning and weaving machines, or between different headstocks of a mule, or between differently constructed parts of a single mule headstock—then the friction brake of course is no longer applicable, and a delicate, scientific, yet simply constructed instrument becomes a generally acknowleged desideratum. Such an instrument is what engineers now call a rotation-dynamometer, and a perfect instrument of this kind is yet to be designed. The name rotation-dynamometer is given to distinguish it from those instruments which measure and register linear exertions of power, or forces exerted in a straight line, such as the pull of a locomotive engine or of a tug-boat. Dynamometers of that kind present no difficulty in their construction, and there exist a considerable number of such instruments all practically perfect, or nearly so, in their action and performance. Most of these instruments are based upon the production of a diagram, one element of which is represented by the tractive force or linear strain exerted, while the other element represents the time or space of movement through which that exertion had taken place. The area of that diagram representing the product of the tractive effort multiplied by the space through which it has been exerted gives the precise amount of work performed. The form and outline of the diagram itself in those instruments which produce a visible diagram of that kind indicates at the same time the precise fluctuations, changes, and other characteristic features connected with the exertion of power, and thereby gives one of the finest, most trustworthy, and useful records of the performances of machinery which we have in practical mechanics. The steam engine indicator is in reality nothing but a linear dynamometer registering the exertions of the steam pressure as connected with the space traveled through by the piston, and it is certainly one of the finest, most suitably contrived, and most perfect instruments at present at the command of mechanical engineers. For a rotation-dynamometer, the problem consists in producing the same register of power and space with regard to rotatory movements as the indicator gives for a straight-lined exertion of power. We require a diagram showing the amount and variation of power exerted upon a pulley by the belt running over it during the time that any given machine which is driven by that pulley performs its operation. The dynamometers hitherto made for this purpose suffer from several defects. Most of them are complicated and costly instruments, difficult to keep in order, and unreliable in their indications. Others of a simpler nature are interferred with in their indications by alternation of friction and other elements, such as the centrifugal force, which, varying in amount with the speed of rotation interferes with the indications of the dynamometer, which are then correct only at one given speed, and more or less far removed from the true mark as the speed differs from the normal velocity. The Exhibition contains two rotation-dynamometers; they are the best of their kind ever made, and both invented in France. Still our general remarks apply to both of them, and they leave plenty of room yet for any really simple and practical instrument of their kind. The two dynamometers we speak of are those of M. Taurines, in Paris, and of M. Engen Bourdon, the well known engineer of the same town. The dynamometer of M. Taurines is a very complete instrument. It was invented some five years ago, and used in a series of experiments made for determining the power consumed by different engineers' tools at the workshops in Indret, apparently with much success. It consists of a pair of pulleys mounted upon a solid shaft and upon a surrounding hollow shaft respectively, and connected together by a pair of segment springs. The transmission of power from one pulley to the other, through the action of these springs, causes the latter to alter their shape, and thereby a tension is exerted parallel with the axis of the two shafts which carry the pulleys. In this direction a small carriage, moving on four wheels and upon a pair of straight horizontal rails, is attached to the springs by a connecting rod, and this carriage is traversed forward and backward upon the rails, according to the action of the measuring springs connected to the two main shafts. The position of the carriage on the rails is therefore equivalent to the strain exerted through the pulleys, and corresponds to the position of the pencil point in the steam-engine indicator. The second element, or the space traveled through, corresponds to the number of revolutions made by the pulleys, and this is transmitted to the indicator in the following way :—

The carriage previously referred to carries upon its frame a long nicely finished cone, which revolves round its own axis in two bearings, mounted so that the upper line of the cone remains always horizontal. This cone is geared by a pair of bevel wheels, so as to revolve with the two driving-pulleys and to make the same number of revolutions. At the top of this cone, and in frictional contact with it, is a sphere guided between rollers which are also in frictional contact with the sphere. The contact between the cone and the sphere, theoretically, is a mathematical point, and this point corresponds to the pencil-point of the other indicators. Now as the cone revolves, the sphere follows the movement of the point of contact, and receives an amount of motion which is due to the circle described by the point of contact upon the surface of the cone during the revolution of the latter. The position of the carriage and cone upon the rail is therefore the element which determines the size of the circle of contact between the cone and the sphere. The annexed diagram shows the relative



position of these elements, and it will be seen from it that the movement of the carriage in the direction of the arrow brings the broader part of the cone in contact with the sphere, and that for one revolution of the cone the sphere will make a greater number of turns in proportion to the increased diameter of the circle of contact. The number of revolutions made by the sphere, and counted by a common engine counter moved from one of the small friction guides, is a fraction of the product of power and distance traveled through, or an equivalent to the work performed. It is necessary only to read off the figures of a snitably arranged counting apparatus to arrive immediately at the power indicated by this instrument, and so far, its use is very convenient; but, on the other hand, it cannot be denied that the apparatus is very complex, and that its elements are liable to derangements and inaccuracy on account of slip, particularly when exposed to sudden changes of power. M. Bourdon's dynamometer consists of a pair of pulleys, each on a separate shaft, and the two shafts are geared together by means of a pair of spur-wheels with inclined teeth. The inclined gearing exerts a longitudinal pressure proportionate to the strain transmitted through it, and due to the angle of the teeth. There is therefore an end thrust caused by this gearing, and this is taken up by one of the shafts which is free, endways, in its bearings, and presses endways against a spring. The spring transmits its movement to a pointer, and in this manner the amount of strain transmitted is registered upon a scale. This instrument, although simpler than the first, is liable to be interfered with in its indications by the changing influence of friction, and so we find ourselves compelled, in the face of those two best indicators yet made, to declare that an absolutely perfect instrument of the kind yet remains to be invented.—*Engineering.*

WATCHES AT THE EXPOSITION.

No section of horology shows greater advance since the Exhibition of 1851 than that of pocket chronometers and watches. The most striking feature is an improved proportion of all the works; but the most essential points of improvement are the increased weights and diameters of the balances, the importance of which in the construction of a pocket watch is now fully established. Although France makes a larger exhibition of watches than England, those exhibited by the latter country are decidedly the best.

The escapements principally in use formerly in watches were the chronometer or detached escapement and the duplex; these, though excellent in themselves, are not well