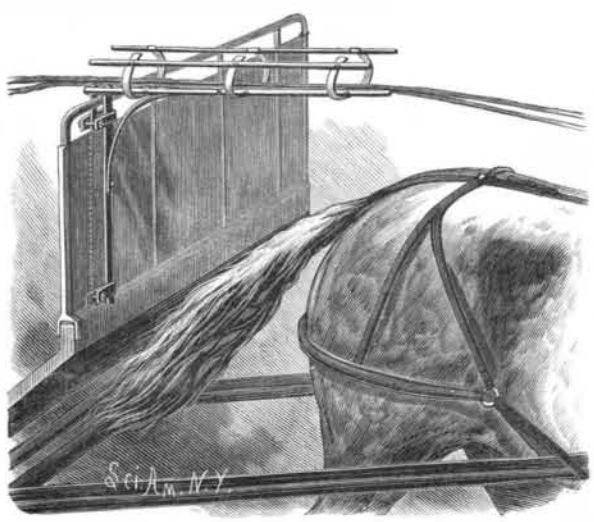
REIN PROTECTOR.

This device is attached to the dashboard of the vehicle, and is intended to inclose the reins, so as to prevent the horse from getting them under its tail. To the bottom bar of the skeleton frame are secured elliptical rings, the upper sides of which are split and separated a sufficient distance to admit of readily placing the reins within and removing them from the rings. To the tops of the rings, on opposite sides of the slits, are secured bars. Secured at right angles to one end of the lower bar are two rods, placed a suitable distance apart to receive the dashboard between them. These bars are held to the dashboard by U-shaped



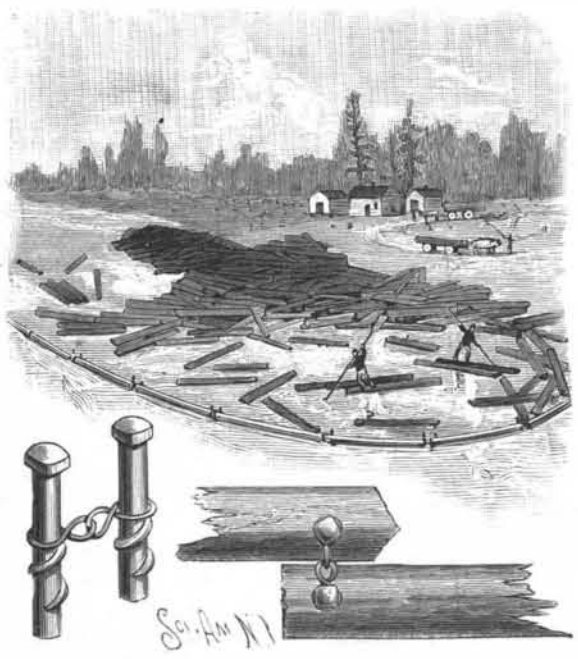
LEITH'S REIN PROTECTOR.

clips, as shown in the engraving. The horizontal part of the protector—that stretching in front toward the horse—has a maximum length of fifteen inches, and is raised sufficiently to have the reins at least six inches above their ordinary height. The protector may be applied to either side of the vehicle, and it is evident that when the reins are placed in the rings they will be protected against interference of the horse's tail.

This invention has been patented by the Rev. David Leith, of Trenton, Tenn.

RAFTING BOOM PIN.

This boom pin is designed to be used in connection with a link or other coupling for forming rafts and booms in rivers for retaining floating logs, etc. The pins are used in pairs, united by a coupling consisting of two united twisted links placed one upon each pin, as shown in the lower left hand corner of the engraving. The pins are preferably made of iron or steel, blunt at one end and formed with a square head at the other end. The edges of the head are slightly rounded, in order to lessen the tendency to gouge into the logway and bend the pin. Upon each pin, near the blunt end, is formed a spiral flange, which engages with the wood of the timber in which it is inserted.



BUISSON'S RAFTING BOOM PIN.

The spiral is of very steep pitch, in order to leave a portion of the body of the pin between the coils, and its lower end is beveled to a point and terminates flush with the surface of the pin just above the end. In applying these pins a hole is bored in the two sticks of timber to be united, the holes being slightly longer than the body of the pin. The pins are then screwed down by a key or wrench applied to the heads. The spirals enter the wood, and securely hold the pins to the timber.

This invention has been patented by Mr. Cyprian Buisson, of Wabasha, Minn.

On the Absorption and Elimination of Mercury in the Human Organism.

Dr. Welander has made a series of experiments to determine how mercury is absorbed by and eliminated from the body. To the urine is added liquor sodæ and a little honey, and the mixture boiled for a quarter of an hour in a retort. Then the liquid is poured out into a glass, where it is left until complete precipitation has taken place. Next, the fluid is poured off, and the precipitate is placed in a glass retort. A little hydrochloric acid is added, and a piece of copper wire, three centimeters long and half a millimeter thick, which has just been heated to a red glowing heat, is placed in the retort. The fluid is now heated to the boiling point, and the opening of the retort closed with a cork, after which the retort is placed in an oven at a temperature between 95° and 149° F., and left there for thirty-six or forty-eight hours. At the end of that time the wire is taken out, dried, and placed in a thin glass tube, the opening of which is closed by melting. That part of the tube which contains the wire is heated over a very weak flame of an alcohol lamp. In consequence of this procedure, the mercury is sublimated, and deposited as small metallic globlues in the upper part of the tube.

The presence of iodine salts prevents the precipitation, and they must, therefore, be removed from the urine if it contains any. The best way of doing this is to collect the precipitate formed after the first boiling on a filter, and pour a little water on it once or twice. We must not take too much water, because the mercury is soluble in water.

The test described is so fine that mercury has been found in a solution of corrosive sublimate of 1 in 10,000,000.

The experimenter must make sure that his reagents do not contain any mercury, which is often the case with hydrochloric acid.

Sometimes the globules of mercury are visible to the naked eye, but the safest way of examining them is by means of the microscope.

When mercury is given by the mouth, it appears, as a rule, in the urine one or two days later. Administered through the anus, it was already found the following day. When applied through the skin, it appeared likewise, as a rule, on the following day in the urine.

Mercury is rapidly absorbed by wounds and ulcers.

Injected under the skin, mercury is very rapidly absorbed, and appears often in the urine as early as one or two hours after the injection.

Mercury is constantly eliminated with the urine; a very great part, and perhaps the greater part, of what has been introduced into the body leaves it in that way.

The salivary glands play quite a secondary role in this respect.

The fæces, on the other hand, contain constantly mercury, and often in considerable quantity.

Mercury is likewise eliminated with the milk, and was found in the urine of the nursling.

The elimination takes place in proportion to the amount introduced.

Welander discredits the statement of Paschkis and Vajda that mercury may remain for twelve or thirteen years in the body. He has, as a rule, found it four or six months after the end of the treatment; frequently it is found from six to twelve months, and sometimes even more than a year, after the treatment has been discontinued.

Welander thinks mercury circulates in a soluble form with the blood. He found it in abundance in this fluid in every case examined. He found it likewise in pus taken from patients treated with mercury, and in ascitic fluid.

The conclusion to be drawn for practice from these experiments is that when a rapid and powerful effect is aimed at, the administration of mercury by hypodermic injections is preferable, while for the intermittent treatment of Fournier the mercurial pills will do as well.—*Dr. Edward Welander, Abst. fr. Nordiskt Medicinisk Arkiv, xviii., No.* 2, 1886.

Defense of New York within Thirty Days.

Captain Ericsson, of Monitor fame, writes as follows to the New York *Herald:*

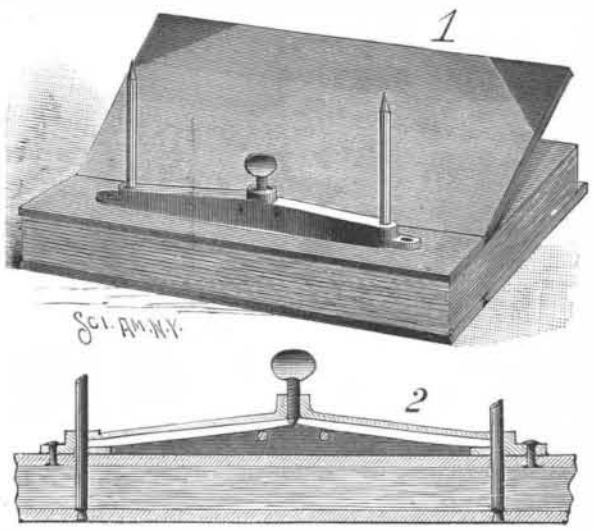
I have read with much attention the editorial paragraphs published in several journals relating to the Destroyer and its submarine gun, and beg to state for the information of all concerned that the Destroyer system so completely solves the problem of applying submarine artillery for defending harbors that I have had no occasion to waste time on the consideration of any other method. Moreover, the extraordinary caliber of the submarine gun employed in the Destroyer, viz., 16 inches, has presented no practical difficulties, and has not failed in a single instance during a long series of trials to expel the submarine projectile with a velocity exceeding 300 feet in three seconds.

It should be mentioned that this projectile is 25 feet long and carries 300 pounds of guncotton, a charge sufficient to shatter the hull of ironclad ships of all classes so completely that the boasted "water-tight compartments" will prove of no avail in preventing destruction and sinking. JOHN ERICSSON.

BINDING FILE.

The accompanying engraving represents an improved binding file, which is the invention of Mr. James W. Dickieson, of 17 and 19 Rose Street, New York city. Near one end of the bottom cover are two upright rods, pointed on their upper ends. To the upper surface of the top cover is fastened a guide frame formed with apertures fitting over similar ones in the cover. In a recess in the guide frame are placed two bars, held at one end by a bearing in the frame, the other end being supported by a pin. Through the middle of the guide frame passes a screw, which is pointed at its lower end. The sectional view, Fig. 2, clearly shows the arrangement of these parts.

In order to place additional documents on the file, or



DICKIESONS' BINDING FILE.

to remove those already on, it is necessary to remove the top cover. The documents are placed over the pointed uprights and pressed downward in the usual way, when the top cover is placed on the rods and moved down until it rests on the papers. The thumbscrew is then screwed down so that its pointed end forces the bars outward until they press against the uprights, and thereby lock the top cover in place. When the thumbscrew is turned in the opposite direction, the bars are released from the uprights. The cover and any of the documents can then be removed, the thumbscrew serving as a handle.

CHILD'S TRAY.

In this tray provision is made for holding a plate in a protected position, and also for receiving a drinking vessel, while any liquid spilled upon the tray will find its way to an under or subsidiary tray. In the bottom of the main tray is a large circular opening, the edge of which is struck up to form a convex or embossed surface. The purpose of this opening is to expose the receiving surface of a plate placed upon the under tray and held firmly by the inwardly curved edge of the opening which bears upon it, as shown in the lower sectional view. The convexed surface accommodates the flaring sides of the plate, and serves as an additional stay therefor. Toward the upper right hand corner of the tray is an opening to receive a glass, and

COUSINS CHILD'S TRAY.

at intervals in the bottom are cut drain apertures, through which any spilled liquid will flow to the subsidiary tray, which is of the usual construction, and in which the main tray rests. In such a tray the child has easy access to the contents of the plate, but cannot remove the plate itself, and the glass is so held that it is not liable to be overturned.

This invention has been patented by Mr. Thomas Cousins, of Norwalk, Conn.