

How to Pack Drugs and Chemicals for Export.

The following suggestions will be found of practical value:

1. Salts should be put in stoppered glass bottles or packed in casks, if sent in large quantities. Casks used for hygroscopic salts should be lined with oil cloth or parchment paper. Salts should never be packed in tin boxes or in paper only.

2. The glass stoppers of all bottles containing either liquids or dry substances should be greased with a little vaseline in order to avoid any difficulty in removing them.

3. Parts of plants, such as leaves, roots, etc., should be packed in sacks, and these again in cases; very delicate drugs in tin boxes. Vegetable powders should be packed in hermetically closed glass bottles or tin boxes. Drugs which occupy much space should be pressed as much as possible before being packed, especially if the shipping freight is calculated according to the bulk of the goods.

4. Boxes and cases should be lined with zinc, or where this is too expensive a strong and good oil cloth will usually be sufficient.

5. Although the utmost care is necessary in packing, yet packing materials such as hay, straw, etc., should be used as sparingly as possible, as duty has usually to be paid for the weight of these as well as for the goods themselves.

6. Cases should be secured by iron bands, and it is always desirable that the weight and volume of cases should be as small as possible.

7. Acids, caustic or inflammable substances must be packed according to the regulations of the different railways by which they are transmitted prior to shipment. As a rule stone bottles are best for acids and ammonia, and glass or tin vessels for volatile substances. All these should be closed by corks saturated with paraffine, and then wrapped in sail cloth, which, with the string securing it, should also be soaked in paraffine.

8. Acetic acid may be safely conveyed from place to place in carboys of 5 to 10 gallons capacity.

9. Liquor ammonia should never be put into iron vessels.

10. Vessels containing volatile substances should never be quite filled.

11. As acids and caustic and inflammable substances are conveyed on the decks of sailing vessels only, the cases containing them should be well closed, and the address, mark, number, etc., be such as will resist sea water.

12. Liquids should not be packed in the same case with dry substances.

13. Valuable or expensive chemicals, such as ethereal oils and essences, should be packed in strong tin vessels and closed with corks saturated with paraffine as before described.

14. The weights and measures of the country to which the goods are sent should always be used, to avoid loss and inconvenience.

15. Besides observing these rules for packing, consigners of goods should be thoroughly acquainted with the customs tariffs and regulations of the countries to which they are sending, as pecuniary loss and inconvenience may occur from ignorance of them. For instance, if a case contains various substances, the duties on which are different, it is usual in some tariffs to calculate the duty of the whole of the contents of the case or at least of the packing materials at the highest rate. The importance of packing together goods upon which the customs tariffs are similar is self-evident from this.

16. In cases of urgency small quantities of any substance suitable for such transmission, *e. g.*, quinine, antipyrine, salicylic acid, etc., may be sent as patterns without value, and thus avoid the delay caused by the customs office.—*C. Monheim, Chem. Zeit.*

Redevelopment of Thin Negatives.

Mr. C. F. Cooke, of Wilkesbarre, Pa., in an article received too late for insertion in the "International Annual," gives a formula for redevelopment of thin negatives, which he has used with great success, as follows:

STOCK SOLUTION NO. 1.

Mercury bichloride 80 grains.
Water..... 10 ounces.

NO. 2.

Iodide potass..... 50 grains.
Water..... 6 ounces.

NO. 3.

Bromide ammonium 50 grains.
Water..... 6 ounces.

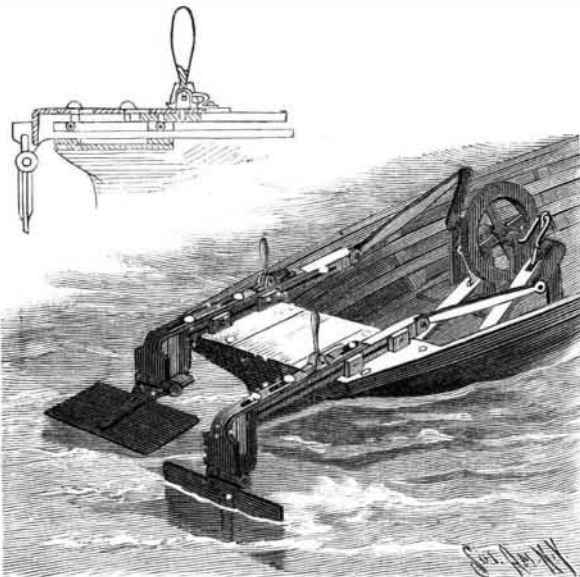
NO. 4.

Hypo sulphite of soda, saturated solution, a few drops at a time, till red precipitate is just redissolved.

First dissolve the mercury, and then add Nos. 2, 3 and 4 in order. For redevelopment take of stock solution one ounce, and of water one ounce, and after thorough washing, proceed as in ordinary developing.—*Bulletin.*

A BOAT PROPELLING AND STEERING DEVICE.

By means of the attachments shown in the illustration a boat may be driven forward or backward, and readily steered, by foot power, or by the operating of a crank by hand. Affixed to each side of the stern, near the rear seat, is a keeper plate in which slides a longitudinally and horizontally slotted bar, extending out beyond the stern, each slide bar having a depending end, in which is pivoted a paddle. The paddles are secured to the slide bars by straps, which project above the pivotal point, and are adapted, as shown in the small sectional view, to engage the depending end



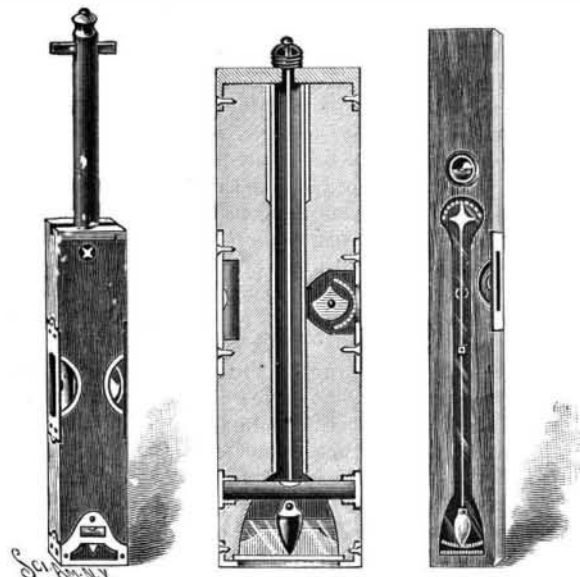
REHM & MARX'S PADDLE DEVICE FOR BOATS.

of a plate held to slide on the slide bar, by which the paddles are adjusted to move the boat forward or backward. When the plates are adjusted as shown in the large view, their depending ends are in the rear of the stops of the paddles, which will thus be held in a vertical position to push the boat ahead as they are moved backward, the paddles turning up edgewise as they are drawn forward, but when the depending ends of the plates are in front of the paddle stops, as shown in the sectional view, the paddle will operate to force the boat backward. Each adjusting plate has, near its forward end, lugs, in which a lever is pivoted within convenient reach, and by means of which the plate may be readily moved forward or backward upon the slide bar, and secured in place to hold the paddles in proper position for the forward or backward movement of the boat, or to prevent one of them from being operated at all, the latter feature affording great facility in steering the boat. The front ends of the slide bars are pivotally connected by pitmen with the cranks of shafts on opposite sides of the boat, the shafts being turned by pedals, which also turn a central shaft carrying a balance wheel, or the cranks may be arranged for operation by hand. To insure the easy working of the slide bars, rollers are arranged in the slots of the bars, by which the friction is reduced to a minimum.

Further information relative to this invention may be obtained of the patentees, Messrs. John Rehm and Ferdinand A. C. Marx, Westchester Avenue and Bronx River, New York City.

A COMBINED PLUMB AND LEVEL.

In this improved device, as shown in the illustration, the left hand figure represents a face view, with a



GARNER & CONNAUGHTON'S PLUMB AND LEVEL.

raised extension, the middle figure being a central sectional view, while at the right is shown a modified construction. The sides of the stock form straight edges, and at its lower end is a mortise in which plays an inclosed plumb bob over a glass plate provided with graduations, visible through an opening. The bob is also visible through side glasses, through which like-

wise may be seen a removably secured spirit level set transversely in the stock, the cord by which the bob is suspended being seen across the level. A short, steady- ing rod projects into an opening in the upper part of the bob, to prevent its rotation and permit a limited swinging motion, and the bob cord extends up through a central recess or channel in the stock, a tubular extension being also supported to slide in the stock, through which the cord may be passed, to be secured to its cap, around which the cord may be wound when the tube is lowered into the stock. There are guide lines on the stock and on the extension, whereby the latter may be set accurately, and the extension has an arm or cross bar whose ends are in line with the straight edges of the stock, adapting the device for use on a longer surface than when the extension tube is down in the stock. At one edge of the stock is a spirit level, and in its opposite edge is a swinging gravity level, the weighted pointer of which is seated in a mortise having glass top and side plates, the latter marked with graduations. In the modified construction shown in the figure at the right, the recess for the bob cord is mortised in the face of the stock and covered by a glass plate, the suspension device being a pivoted bar having at its upper end a pointer registering along a graduated scale.

For further information relative to this invention, address the patentees, William J. Garner and Thomas Connaughton, Latourell Falls, Oregon.

Production of Copper in the United States.

Census Bulletin, No. 96, relating to copper production in the United States, has been prepared by Mr. Charles Kirchhoff, special agent, under the supervision of Dr. David T. Day, special agent in charge of the Division of Mines and Mining, of the Census Office. The report shows the United States to be the largest producer of copper in the world, its product for the year 1889 being 226,055,962 pounds, or 113,028 short tons. The total expenditures involved in this production were \$12,062,180, of which there was paid in wages, \$6,096,025; in salaries, \$120,896; to contractors, \$334,443; for materials and supplies, \$4,067,970; and for taxes, rent, etc., \$1,442,846, the total capital invested being \$62,623,228, and the total employes, exclusive of office force, 8,721.

The copper product of the United States was as follows, in pounds, in the calendar year 1889:

	Pounds.
Arizona.....	31,586,185
Michigan.....	87,455,675
Montana.....	98,232,444
New Mexico.....	3,686,137
Colorado.....	1,170,053
Idaho.....	156,490
Nevada.....	26,420
Utah.....	65,467
California.....	151,505
Wyoming.....	100,000
Vermont.....	72,000
Southern States.....	18,144
Lead smelters and refiners.....	3,345,442
Total.....	226,055,962

During the last ten years, Arizona and Montana have made wonderful progress in the mining and production of copper, and to-day Montana, as will be seen from the above statement, leads all other States in this production, its product exceeding that of Michigan (which has heretofore been the leading producer) by 10,766,769 pounds.

American Screws in England.

Another industry, of an important character, is about to be introduced into Leeds. For some time past, says *Iron*, the American Screw Company, of Providence, R. I., has had in contemplation the establishment of a screw factory in this country, and circumstances being now favorable for the enterprise, Leeds has been selected as the industrial center offering the most advantageous conditions. An eligible site has been obtained in Leeds, viz., that of the Old Perseverance Iron Works, in Kirkstall Road. It is proposed to cover the frontage to Kirkstall Road to the extent of 100 feet, and to carry the building back for 344 feet, with a width (over the greater part of the latter) of 80 feet. When the time for extension arrives a duplicate of this building will be erected; and when this has been done, the two buildings running backward from the road will be separated by a yard 40 feet in width. The screws manufactured will be exclusively of the kind used by joiners and carpenters, and they will be of the English pattern. The machinery for the factory will come from America, and be adapted to the requirements of the trade in this country. The screws are packed in paper boxes, and these, together with the necessary labels and trade marks, will at the outset be procured from English firms; but the company intend eventually to make the boxes on their own premises, and will, in all probability, print the labels and trade marks there likewise. The finished wire used in the manufacture of the screws will also at the start be obtained elsewhere; but the scheme of the company includes the construction of wire mills and annealing furnaces alongside the screw factory.