

siphon, and as near the level of the top of the outlet bend as possible. The siphon will then need no starting after it has once been put in operation. The second glass tube—the smaller one—is then closely connected to the stem of the Y. This tube should be at least eighteen inches long, for best results. Its length determines the depth to which air can be carried below the surface of the water in the aquarium below, and this drop tube should reach almost to the bottom of the aquarium, so that the bubbled air may come in close contact with as much of the water as possible. A vessel of some kind—a battery jar serves well—is now stood on some convenient support above the aquarium and is filled with water from the aquarium. The apparatus can be started easily by slipping a piece of rubber tubing about two feet long over the open end of the Y and sucking on it. As soon as the water starts to flow through the siphon, this tubing is removed and the screw clamp tightened until water no longer drips from the open end of the Y, but instead a series of air bubbles is sucked in. Once started, the only attention required is an occasional replenishing of the water supply from the aquarium below. Care must be taken, of course, that no debris which might clog the Y is transferred. With this piece of apparatus an aquarium can be kept near a window where the aeration will be supplemented by the photosynthetic activity of the plants, and by manipulation of the window a reasonably low temperature can be maintained. Under such conditions, if the aquarium is not overstocked, filling the reservoir two or three times a day will suffice to keep the water sufficiently aerated.

If desired, several aquaria can be placed in tiers, and an aerator be placed in each, leading to the aquarium below, so that only one upper reservoir need be filled to keep the series in operation. In that case care must be observed that the open end of the Y is at the normal water level of the aquarium. Any surplus water brought in by the aerator above will then serve to operate the aerator for the aquarium below.

This device has proved particularly useful when the tap water was chlorinated and it was necessary to bring pond water into the classroom. Also with marine material, when the amount of sea water available was limited, it has still been found possible to keep the animals alive in the laboratory for several weeks.

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A NEW STOP-COCK CLAMP

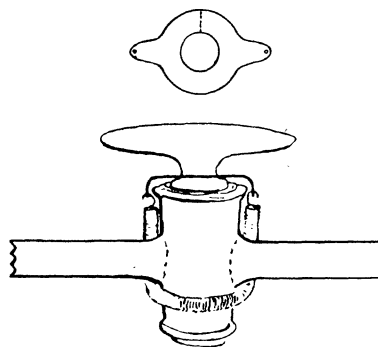
SOMETIMES it is necessary that glass valves be made relatively more leak-proof than the binder in the valve lubricant can assure. This is especially true if valves in a system are subject to pressure over consid-

erable periods of time. To overcome such difficulties in leakage, a spring clamp was devised and is herewith described.

A stiff collar is cut from sheet copper (.5-.7 mm thick) in a form similar to the drawing. It is then cut half across and opened to admit the neck of the glass plug. The ends of the collar are then turned down but so that they still clear the seat portion of the valve.

If the closed spring coil, which is used, can not be purchased, it may be made by winding No. 2 music wire¹ on a stiff iron wire or small rod held in the chuck of a breast drill—the latter clamped in a vise. After a 2-3 cm length of coil has been wound, it should be set by heat (in a flame) before removal from the small rod on which it is wound.

The spring tension on the collar varies, depending on the size of the cock and its use. However, as a



criterion for the usual size cock, an adjustment to give a pull of 100-200 g is found to be satisfactory. A moderate tension on the plug will not force the lubricant out appreciably and cause freezing of the valve if a good lubricant, as "Lubriseal," is used. The clamp may be plated if subject to corrosive vapors.

One notes that the collar of the clamp rests upon the shoulder of the glass plug but still permits its perfect freedom of movement; and that the plug may be removed and cleaned readily by extending the spring over the end of the plug seat.

This clamp has found satisfactory application on stop-cocks of manometers, vacuum pump distributors, gas analyzing burettes and other apparatus. Two stop-cocks at the base of one of the gas-analyzing machines—a multiple bulb side-arm type burette—supporting a meter column of mercury, were found to remain functional and leak-proof for weeks without cleaning.

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¹ Obtained from large hardware stores.