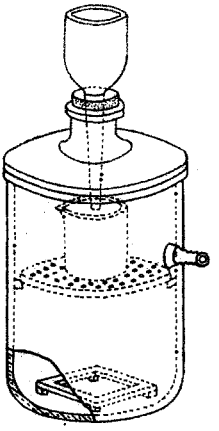
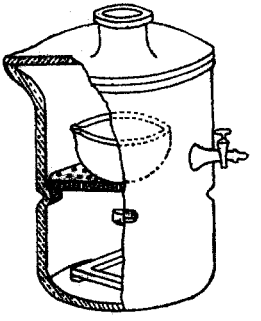
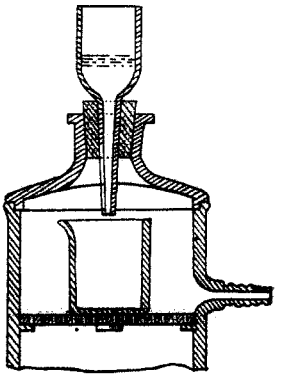
a small beaker or crucible is placed thereon to catch the filtrate. After the filtration, whether with a Gooch or ordinary filter, we find the filtrate is in the desired vessel ready for the next operation. If large quantities







are to be filtered the shelf is removed and a large beaker inserted; or the jar itself may be used very conveniently, the three small protrusions interfering but little in washing, and the pouring lip facilitating the emptying of the jar.

There are, indeed, many suction filters which in certain respects resemble my filter, but owing to their lacking in certain features have not rendered themselves very popular. My filter I find the most simple and natural, and at the same time most convenient for speed, neatness and accuracy, and for that reason have called attention to it and have named it the Takamine Analytical Filter (for which the patent is pending).

JOKICHI TAKAMINE, JR.

NEW YORK.

An Alternating Current Thermoregulator.—The electromagnetic thermostat regulator is a well-known convenient instrument. The principle of operation is that the expansion or contraction of mercury in a large open mercury thermometer makes or breaks a contact which throws on or off a current through an electromagnet.

Regarding these regulators Ostwald[1] says: "The great drawback I find with such instruments is that the current always remains closed for a considerable length of time. This causes a rapid running down of the battery which in turn easily occasions the regulator to fail in its action."

It was suggested by Professor J. W. Dorsey of the electrical engineering department of the University of Manitoba that alternating current from the city mains might be used to run the electromagnet and accordingly

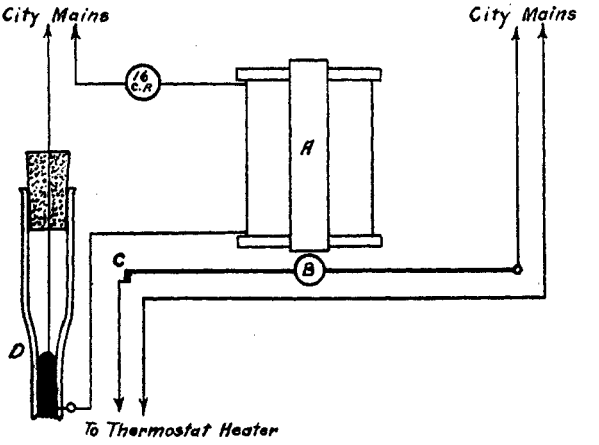
[1] "Physico Chemical Measurements," 1894, p. 62.

an arrangement was constructed as shown in the diagram. It may be a surprise to many chemists to know that an electromagnet can be run by alternating current, but with a current of 60 cycles the pull on the armature is quite appreciable.

The electromagnet had the following construction: The soft iron coil A was 4.5 cm. long and 0.9 cm. in diameter.

The winding consisted of about 350 turns of No. 20 insulated copper wire wound directly on the coil and well protected at the ends by two hard rubber disks.

The soft iron armature B was sawed from a circular bar. It was 0.8 cm. in diameter and 0.2 cm. thick. It was soldered to a piece of No. 19 copper wire as shown in the diagram. The position shown there was chosen



for the armature because then only a small surface came in contact with the core and also the pull of the electromagnet seemed to be stronger than in any other position of the armature.

The electromagnet and lamp resistance were fastened permanently on the wall beside the thermostat in such a position that when no current is flowing through the electromagnet the armature falls down and the circuit through the thermostat heater is completed at C. An excessive temperature in the thermostat causes the mercury in the regulator to rise and completes the other circuit at D. The electromagnet then draws up and retains the armature, breaking the heating circuit at C. The wires at C must be fairly stout to prevent overheating and sticking due to sparking. The vibration of the armature also tends to prevent sticking of the contacts.

The amount of electric power used in the electromagnet coil and in the lamp resistance is small. This apparatus has been in use for two months and has given satisfaction.

HAROLD S. DAVIS.

UNIVERSITY OF MANITOBA, WINNIPEG, CANADA.

January 8, 1915.