wire of same size laid out straight and subject to the same rate of interruption.

The interrupting hammer or vibrating spring may be purely a mechanical contrivance for breaking and making again the electric circuit with suitable rapidity, but is more generally an electro-magnetic arrangement. A small electro-magnet is so placed that when the current is passed through its coils, a soft iron armature attached to a spring is drawn towards its poles, and away from a conducting pin, fixed suitably near the other side of the spring. As soon as this happens, however, the circuit is broken by reason of the break of contact between the conducting pin and the spring, the poles of the magnet lose their magnetism, and the armature is forced back by the spring, till the latter again completes the circuit by making contact with the conducting pin.

Thus a regular and continued vibration is set up, involving the rapid make and break of the electric circuit of which the primary coil forms a part. The common electric trembling bell is a good illustration of the principle upon which the interrupting hammers of induction coils are worked. The primary coil and its soft iron core or an extension thereof often forms the electro-magnet of the interrupting arrangement of induction coils, and it is so represented in Fig. 25.

The secondary coil generally consists of many turns of fine wire, and is so arranged that it and the primary can be moved relatively to one another. The wire of this coil is in no way electrically connected with the primary circuit. It depends upon induction for its electric properties, for when such a coil is placed near the primary coil in which interruptions are set up, currents *alternating* in direction are induced in it. The strength of these induced alternating currents is increased or diminished in accordance with the nearness of the secondary coil to the primary, being greatest when the secondary entirely contains the primary, and least when they are farthest away from each other.

The effect of the soft iron core is to increase the strength of the induced currents.

The most common methods of regulating the power of induction coils are as follows:—(*a*) Altering the number of battery cells used; (*b*) altering the number of vibrations of the interruptor; (*c*) altering the relative position of the two coils; (*d*) altering the number of turns of the primary wire brought into circuit.

(To be continued.)

The only faith which wears well and holds its colours in all weathers is that which is woven of conviction.

PRIZE ESSAY COMPETITION.—XVI.

Consolation Prize.

Describe the best manner in which a Kitchen should be fitted up suitable for the Staff and Patients in a Hospital or Home of Twenty Beds, the Utensils required, the Makers' Names and Approximate Cost of them; and mention every detail considered necessary for the smooth and proper conduct of such Kitchen.

By Miss Emily Louisa Symonds,
Royal Infirmary, Edinburgh.

(Continued from page 187.)

Having furnished our kitchen, our next point is to have a cook who thoroughly understands the use and cleaning of her tools, that the meals cooked by her may be palatable by all who partake of them. She must know the principles of cookery, such as that joints of meat and fish must be placed into boiling fat or water, to coagulate the albumen, and thus retain their juices. Bones for stock, meat for beef-tea and broth, should be put into cold water, to extract as much goodness as possible from the meat.

Salt in fat prevents meat browning. Stewing is gently simmering, not boiling. Joints to be baked should be placed in hot oven, at once basted, and frequently afterwards.

Stocks, broths, and beef-tea should be made the day before required, to allow the fat to rise and be removed; but where this is not possible the fat can be lessened by placing over white blotting paper to absorb it. A current of air must pass through the oven when meat is being cooked in it, to carry away the vapours arising from the joints.

No joint should have the outer crust broken, or its gravy will escape.

Ham which has been boiled must remain in the water until nearly cold, or it will lose much of its juice.

All scum should be removed from saucepans containing meat or fish as soon as it rises.

The secret of vegetable cooking lies in putting them into boiling water, adding salt, and seeing there is plenty of water; but this rule has its exceptions.

Eggs for cakes and many purposes are much more economical if yolks and whites are beaten separately, all in the cool; but yolks in basin, white to a stiff froth with spatula on a dish.

Next to grasping the principles of cookery, it is essential she should understand the proper manner of keeping her utensils clean and preventing labour, by seeing that all saucepans have water poured into them directly they are finished with; the greasy have soda in addition; the

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