MUNICIPAL TELEPHONE PLANT AT NEEPAWA, MANITOBA.

(Concluded.)

After the mate plug is inserted into the line jack of the subscriber wanted, and the key is pulled toward the operator, it cuts in the generator and rings the subscriber's bell. When the key is in the ringing position, it is automatically restored when the operator releases the pressure on the cam. The key may, however, be locked in the listening position so that an operator can carry on a long conversation with a subscriber, if necessary, without holding the key in position.

When it is desired to ring back on the line originating the call, the small button back of the regular ringing cam is pressed toward the board, which throws the generator on the answering cord. This combination key is so constructed that it requires but one set of main ringing springs, making two less springs and four less contacts than any other key of its kind now in use. The keys are provided with long heavy springs, punched from the highest quality spring German silver sheet. The springs are provided with platinum contacts.

The springs in the complete key are firmly clamped between mica insulations by heavy machine screws bolted into heavy brass nuts, making it absolutely impossible for these parts to get out of adjustment. The keys are mounted on a hinged shelf, so that the shelf may be raised for conveniently inspecting any other part. Under the key shelf is mounted the operator's receiver cut-in jack, so that the operator may conveniently connect or disconnect the receiver. Immediately under the cut-in jack is mounted the night-bell switch. At the right end of the board is mounted the generator and the power generator key.

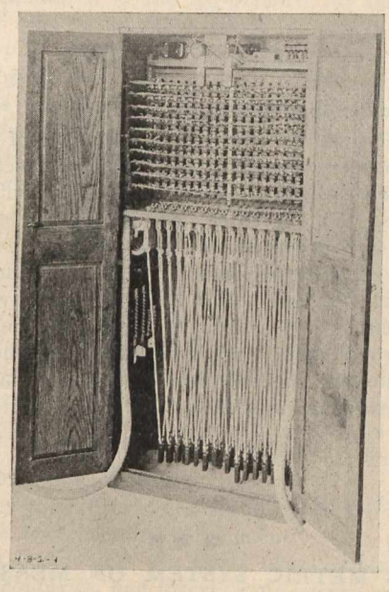

Fig. 2.—Switch-Board, Showing Wiring for Central Energy System.

Fig. 2 shows an interior view of the rear of the switchboard, showing the wiring of the line equipments, the night bell, the operator's instrument induction coil, the central energy coil, the cord circuits, etc. The wiring shown is for either a generator-call or central energy system. As constructed and used at the present time, it is for generator-call and local battery system.

At the top of the board, between the night-bell and induction coil on the central energy coil, is shown a direction card reading: "Take short off this coil for central energy." This is the only work required for changing this switchboard from a magneto call local battery system to a complete central energy apparatus, in addition to connecting the central energy wires at the line equipments, which are provided with screw terminal wire clips so that the change may be readily made.

This system enables companies who are not in position to install complete central energy when first building or rebuilding their plants, to equip their central office so that the plant may be changed at any time when installing metallic construction, to full central energy without discarding any of the apparatus already installed. In re-equipping exchanges, this system may also be used with other makes of the old type telephones by cutting out the generator and installing a condenser so that the signalling at the central office may be done automatically by taking the receiver from the hook, and the disconnecting signal may be thrown by replacing the receiver and leaving the telephones with batteries locally. This enables re-equipping any exchange on the installment plan, making the change in sections, and when completed, costing practically no more than if the change were made at any one time.

The cabinet-work of the switchboard is highly finished, close-grained and well-seasoned quarter-sawed oak, with all parts properly fitted and well joined, to make the equipment rigid and durable. At the bottom of the switchboard is provided a heavy brass foot-rail to brace the front of the board as well as provide a foot-rest for the operators.

This equipment, which has been recently installed at Neepawa, places the municipality in position to connect the subscribers that have been awaiting the increase of the plant for their connection.

The municipality, at the present time, has in operation about 180 subscribers, which shows one instrument for less than every nine inhabitants, notwithstanding the fact that the Bell Company has made strong efforts to regain that field.

The Bell Company, although having the advantage of offering long distance connection with Winnipeg and throughout the North-West, have only seven subscribers remaining in their exchange. This is certainly another good example of the great benefits of the independent competitive telephone service, and well demonstrates what may be done in every city, town, village, hamlet and in rural districts throughout the Dominion.

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FRAZIL ICE.

Editor Canadian Engineer:

Sir,—In your February issue Prof. Barnes commends the Toronto Engineers' Club for delving into the mysteries of frazil ice, but without fully concurring in the theories advanced.

We can all agree with Prof. Barnes upon the importance of the subject. My own investigations lead to the conclusion that further subdivisions in the names are necessary before a clear discussion of the subject can be carried on or a clear conception of the matter be entertained. We have, first, water at an ordinary temperature; then there is water that is just about to freeze. Prof. Barnes states that the 1-100 part of a degree of frost separates the water from being ice.

The word frazil no doubt comes from the French word "fraiche," meaning cool, new, recent. The word would equally well apply to water, and frazil water would represent that water which is separated from being ice by a fraction of a degree or by degrees of motion. Then there can be named what I would call eight different kinds of ice, viz.:—

1. Ordinary ice formed in still water, named surface ice.
2. Frazil ice, being ice formed by shock or change of motion (lowering).
3. Then anchor ice, which is a formation from frazil ice, accumulating on obstructions below the surface of the water.
4. Spray ice, which is from water that is thrown in the air in the form of spray, becoming thoroughly charged with cold air, and freezing instantly from shock upon landing upon any object.
5. Float ice, which consists of pieces of ordinary ice broken in fragments of various sizes.
6. Sponge ice, which is an accumulation of frazil ice in a forebay, or such a place, or partially dissolved anchor ice, or partially dissolved float ice.
7. Ice that is formed by successive increments caused by raising the water level above the top of the surface ice already formed there, or forming from wave action of water