

and one of their zincs should be instantly disconnected. In this operation the circuit is not broken for an instant. In amalgamating, only strong solution of sulphuric acid and water should be used, never muriatic acid.

8. The frequency of renewal, will depend upon the use given to battery, once in fifteen days, is the general average on Morse's Lines, and its necessity will always be discovered, by a weak current, and the formation of salt on zinc plates just above solution.

If battery No. 2 be used, the directions will be slightly amended.

1. Place salts in glasses as in *Fig. 4*.

2. Let supports for shelves be separated in the clear, twenty-two inches.

3. Screw iron bracket against these supports, so that they will just clear the glasses, and the sticks resting on them will hang over the glasses as in *Fig. 5*.

4. The zincs may be allowed to rest on the bottom of the salts.

REMARKS.

1. Zincs when new, should always be amalgamated before using, those sent with the battery are always amalgamated. Sometimes their first coating will last two weeks. It is best to watch them carefully during the first week of their use, and if any blacking or signs of much corrosion appear on any one, take it out at once and give it a new coating. The better the zincs are kept clean, the longer will the solution last.

2. The solution is drawn by the syphon from the *bottom* of the glasses, because the used-up acid sinks.

3. A hissing in one or more cups, shows that some wrong connection exists. This should be searched for and remedied.

4. Through carelessness, neglect, or accident, the free acid in a cell may be all used up and the solution become sulphate of zinc. Zinc will be deposited upon and injure the platina plate. It can easily be detected—put in a new platina plate and fresh solution.