## AND THE INDUSTRIAL ARTS.



A New METHOD OF MAKING CHAIN LINKS.

will work without any further attention so long as the charge of lime is unused. The preparation of the lime water is effected as follows :- The tank F, with a perforated bottom, is filled with lime, and the adjusted quantity of water flows on to this from the tap D. Below the charge of lime at J is a concentric helix and paddle, which is set in motion by the revolution of the wheel E, which is itself moved by the flow of water into the precipitation cylinder. The revolution of the helix below the lime tank ensures a complete saturation of the water with lime, and thus allows a lime solution of constant strength to pass from the apparatus by the conduit F into the precipitation plant. G is a reservoir containing soda solution, and it is regulated by the float I, which is connected with the tank B. The mixed waters first pass down the central cylinder M, and then ascend the spiral of the external concentric cylinder. This spiral is fitted with diaphragms at frequent intervals, which, while arresting the passage of the precipitated carbonate of lime, do not hinder the ascending water, which finally passes through the filter Q and arrives at the top of the apparatus clear and bright, and passes away through the tube R. The precipitate is removed from time to time by opening the precipitation cylinder at the base P, and the lime tank F is recharged from day to day. La Société Industrielle du Nord de la France recently appointed a committee to examine the working of this plant in that district, and in the report the satisfactory use of these softeners is recorded. We are indebted to the *Revue Industrielle* for our illustration.

## A NEW METHOD OF MAKING CHAIN LINKS.

The ordinary method of making chain links is to employ a pair of dies, the bottom one, which is fixed, having in its face a U-shaped groove constructed to receive the end portion of the link to be welded; and the upper, or moving one, being a substantial counterpart of the lower one. Each link is welded separately, and after each stroke of the hammer it is necessary to turn it over on the die, so that both sides shall be subjected to the stroke of the moving die. As the dies are so constructed that one end is closed, the end next the operator at which the links are inserted being open, the part of the chain already formed is drawn out in order to turn the link round, by doing which it is also necessary to turn a portion of the chain. This, besides occupying considerable time, is arduous work, and consequently adds materially to the cost of manufacture. This method, moreover, provides only for the manufacture of end-weld-