THE STANHOPE WATER SOFTENER.

The idea of eliminating from water by chemical treatment the greater part of the mineral matters it contains, before it is used for feeding boilers, bleaching, wool-washing, and other manufacturing processes, is well known but is difficult of application. The addition of a solution of lime will throw down the bicarbonates of lime and magnesia, and similarly carbonate of soda will eliminate the sulphates of lime and magnesia. But the precipitates are not heavy, and it is exceedingly difficult to separate them from the water without very extensive apparatus. Settling tanks, especially if they be shallow, will effect the result in time, but the process is slow, and requires a great deal of space if large quantities are to be dealt with. Filtering is sometimes attempted, and should answer if carefully carried out, but the filtering material rapidly chokes, and requires to be often cleaned. The result is, that although the process is well known, and can be conducted with the greatest ease in the laboratory, yet, as a rule, manufacturers have seldom adapted it, preferring, as the lesser evil, to have the matter deposited in their boilers, and to combat them there by anti-incrustation compounds, by frequent blowing off, and by systematic cleaning.

Recently a new apparatus has been devised by which the precepitate can be extracted from the water by the continuous process, which requires comparatively little space, and no great amount of supervision. It is the invention of Messrs. Gaillet and Huet, and is manufactured in this country by Messrs. Cordner, Allen, and Co., of 38, Bucklersbury, E C., and the Stanhope Works, Fulham, S.W. The apparatus is illustrated above, and consists of a series of wrought-iron rectangular towers occupied internally by a large number of sloping shelves. The length of each shelf is such that it does not reach entirely across the tower, and as the shelves are rivetted alternately to the two sides, a devious course is left from bottom to top, along which the water can flow, passing backwards and forward between the shelves. These, as shown in the illustration, have a very considerable inclination, and slope each way into the corner of the tower, which thus forms a pocket. The water and the chemical agents, mixed in definite proportions, enter at the bottom of the tower, and gradually rise through it at a very moderate velocity. The precipitates flow with the water, but as they are slightly heavier than it, they do not turn round the ends of the shelves with the same facility, and thus get carried into the still pockets where there is no current, and where they lie until removed by the opening of the valves which form the outlet to those places. Thus as the water ascends it gradually loses its turbid appearance and emerges at the top quite clear.

The tanks for the chemicals are shown at the top of the tower. The two larger, which are for the lime solution, are in duplicate, and the smaller is for the soda. The preparation of the reagents is as follows: A quantity of caustic soda is dissolved in the upper tank, and kept there ready for use. In one of the large tanks the workman places every twelve hours a quantity of slacked lime, and stirs it while the tank is run three-quarters full of water. The required amount of soda solution is added, the quantity being measured by a float and a graduated scale, and then more water is admitted, and the whole agitated for ten minutes. This mixture is drawn by a floating pipe from near the surface, and is thus decanted into a small tank provided with a ball-cock that always keeps the surface at one level. From this tank the chemical runs under a constant head into a pipe where it meets the unpurified water, and the two then descend and pass through the tower together as already explained. Supposing the water also to flow under a constant head, the proportion of lime and soda will always remain the same, after they have been once adjusted by an easy test. After this treatment all that remains in the purified water is sulphate of soda and chloride of sodium, neither of which are found to give any trouble.—*Eng.*

THE experiment of substituting the labour of coloured people for that of Chinese is being tried by a San Franciscoan, on his ranch in Los Angeles county Cal. He took there thirty-two families of coloured people from the South, built them cabins in Southern plantation style, and thus far is much pleased with their work. Labour on a vineyard and fruit farm, says a correspondent writing from San Franscisco, is not so severe as on a cotton or sugar plantation, and the climate of Southern California is milder than in most parts of the South.

LEGISLATING AGAINST MONOPOLIES.

What is the use of legislating against patented monopolies; Cut the root of the evil and the continual tinkering of the state will be uncalled for. One mistake in legislation, if persisted in and preserved, eventually leads to many otherwise unwarrantable meddlings with the matter. The United States made a mistake, and a great one, too, as the country is forcibly realizing in many ways, in granting monopolies of manufacture and use to the owners of patented articles and processes, and in this invitation to water stock. The evils of monopoly have cropped out in telephones, barbed wire, Bessemer steel, sewing machines, in various electrical devices, and ceaselessly with other subjects. Farmers have fought barbed wire pools and patents with desperation; enormous profits have been taken out of sewing women and they have not gone into the pockets of the inventors; the right to use the Bessemer steel process will not be sold South; legislators are passing laws limiting telephone charges. The history of patented monopoly in the United States and their extortions, and the puttering counter-legislation, would fill a large volume. Start right in the beginning, and the sailing is smooth enough. Give the inventor a monopoly of royalty on his patent, but give every person in the country a right to use the invention upon payment of a uniform royalty to the inventor. The trouble has never been that the inventors got too much, but that the controlling capitalists practise extortion. Give us the new patent law, and no legislature will ever need to reduce telephone rentals to $3 a month; it will more likely be called upon to save stockholders from loss in the excessively low prices that would accompany competition.

EXPENSES OF BUSINESS.

A well informed merchant of Boston recently said to a representative of a Boston newspaper that he had been looking back over his accounts, and was surprised to find that since the close of the war there had been a steady increase in the ordinary expenses of carrying on business. That this increase of business expenses extends beyond the merchant to the manufacturer and most other kinds of business is a fact patent to most employers. Mere office work costs a great deal more now than it did in 1865; more clerks are beeded, and, on the whole, each of these receive higher pay. Assistance is required in the receiving and delivering departments to an extent and of a character that would not have been dreamed of two decades ago. Then there are a variety of incidental expenses that now enter into the computation. There are telephone charges, printing, the expense of solicitors, the whole making up an amount sufficiently large to eat up all that would have been considered fair profits a quarter of a century ago. The tendency, all the time going on, to lessen the hours of service, both in offices and workshops, of itself makes the cost of business proportionately higher. Competition is sharper than it was ten or twenty years ago, and prices are so much reduced in most commodities which enter into the necessities of a household, that mechanics, clerks and others are enabled to live much better now than it was possible for them to do ten or twenty years ago, when their wages were less and the cost of living was greater.

REMOVING COTTON FROM WOOLEN RAGS.

A successful process for removing vegetable fiber from woolen rags has lately been invented and put into operation by Mr. Duke Fox, of Dewsbury, England. The *Journal of Fabrics*, referring to Mr. Fox's process, states that the operation is more economical and more healthfully conducted than any of the methods hitherto practiced. The chamber for the reception of the rags to be carbonized was filled to its utmost capacity with worsted and woolen rags having a large admixture of cotton in their composition, and after being under treatment by the gas less than two hours, they were then removed without the slightest appearance of the body of the cotton being anything but dust, and this was effected without the woolen or worsted part of the material being damaged in strength or color to any perceptible degree. The carbonizer can be put through about four workings per dav, extracting about 1,000 pounds of shallies, or from 2,000 to 2,500 pounds of cloth rags.