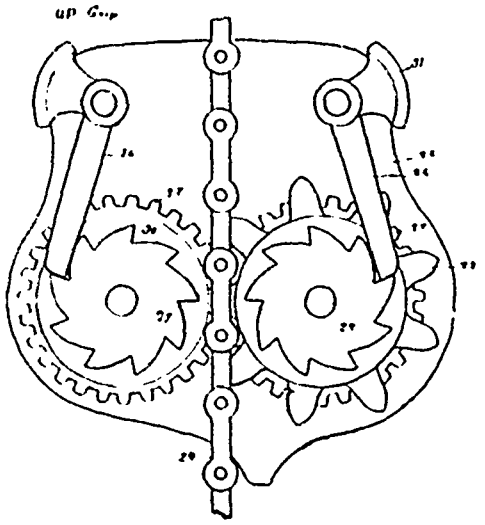
offer no resistance to it. When it is necessary to stop the chain, all that is required is to lift and throw back the ratchet dogs, and the device will offer no resistance to the chain either on the up or down motion. 24 is endless chain; 25, case plate; 26, ratchet dogs; 27, cog wheels; 28, sprocket wheel; 29, ratchet wheels; 30, roller; 31, weight on ratchet dogs.

Fig. 5 is view of down grip. This is just the same as the up grip, only the ratchet wheels and their dogs are placed in the opposite position. When the up grip has gripped and is carrying up the chain on one side, the chain is being drawn down on the other, and the down grip will offer no resistance to the chain. When the down grip has gripped and is carrying down the chain, the same is being drawn up on the other side, and the up grip will offer no resistance to the chain.

The machine is so different in construction from any yet produced that a number of experts have stated that they thought I had solved the problem of harnessing the ocean waves. I have produced the right sort of float, which is just as important a part of such a machine as the piston or steam valve is of the steam engine. The float being hung to truck tube in the way it is, assures a moderate up and down motion of the truck tube. If the float was fixed to truck tube stationary its motion would be different—it would have rapid starts very often. This was proven by an experiment. Another great fault if it were fixed stationary and the float was flat is that a wave would rise over its end and the same would come and go so quickly that it would pass over the float before the latter would rise; on the otner hand, if the float was of any depth it would not rise so quickly, and it would offer great resistance to the surface. All this I have mastered by hanging my float on a pivot; an elevation of water will pass through my structure and slide under the float and find very little resistance. It will do thisno matter from what direction the waves may come. I have provided my air tank with an automatic pressure governor, which insures a uniform pressure in

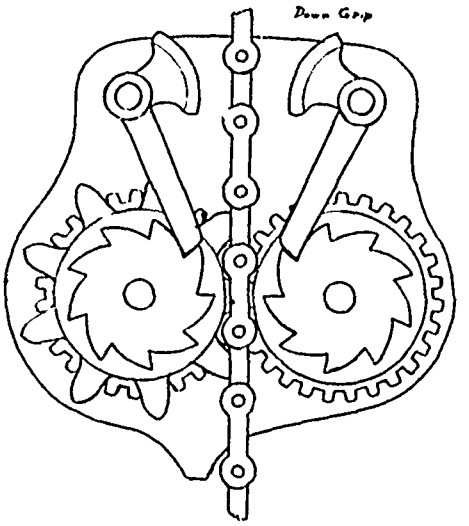


Wave Motor—Fig. 4.

tank in all sorts of weather. The air tank is also provided with a safety valve.

I see in the Electrical News that Mr. Wm. Cross thinks that Thos. A. Edison, jr., got his idea to harness wave motion from him. Now, I think that Edison's machine is no more like Mr. Cross's invention than day is like night. I would say that Edison's machine is more like my own than any other, and permit me to say through your columns that if Edison has copied from any person's machine it has been from mine, as you can judge from the following:

On the 19th day of October, 1897, I wrote, and sent a sketch showing the outside of my structure, to Mr. Thomas A. Edison, offering to send the detail drawings and to give him a half interest in the patent if he would furnish the capital to secure the same. I gave him no information of my working gear, but informed him of the one great tube running down through the centre of the structure. He returned my sketch after a time, and told me that he was so busy that he had no opportunity to look into the subject. Now, in the New York



Wave Motor—Fig. 5.

Journal of January 14, 1898, there appeared the drawings and description of a wave motor, of which Mr. Thos. A. Edison, jr., was said to be the inventor, and it will be remembered that it stated that the development of the details of the plan was the work of a few months in the young wizard's mind. His motor consists of one great pump, the piston rod of which is connected direct to a float. It looks, without a doubt, that the Edisons thought that my central stationary tube was one great pump cylinder, and it also appears as though the young wizard found a little time to look into the subject.

CORROSIVE AND SCALE-FORMING AGENTS IN BOILER FEED WATERS.

By Wm. Thomson.

[Article 7].

Another commonly met compound of a similar type is one containing large percentages of caustic alkalies, usually crude caustic soda. The reaction between sulphate of lime held in solution and caustic soda is similar to reactions already cited.

Sulphate of Lime. Caustic Soda. Calcium Hydro-Oxide. (Lime) Sulphate of Soda.

$$Ca\,SO_4 + 2Na\,OH = Ca\,(OH)_2 + Na_2\,SO_4$$

A similar reaction sets up between carbonate of lime and caustic soda. Water within the boiler soon becomes strongly alkaline and attacks brass and composite fittings very vigorously, also is very prone to foam; particularly is this the case if any saponifiable oil finds its way to the boilers. Compounds containing quantities of caustic soda in the absence of neutralizing agents can be with safety avoided.

Innumerable compounds have been introduced on the market containing organic acids, and some of these have good properties to recommend them. Chief among these are compounds containing "tannin" or tannic acid. Roger's process for the prevention of formation of scale consists essentially in the use of sodium tannate, which is a very useful reagent when properly made and applied. A reaction sets in between carbonate of lime and sodium tannate whereby insoluble amorphous tannate of lime is precipitated and sodium carbonate is formed, which in time acts upon any sulphate of lime present, reducing it to a carbonate of lime, thus leaving it in a position to be acted upon by a fresh supply of sodium tannate. Such reactions as these have sound chemical reasoning to recommend them. Care should be taken, however, that an excess of acid is not present in the solution, or damage to