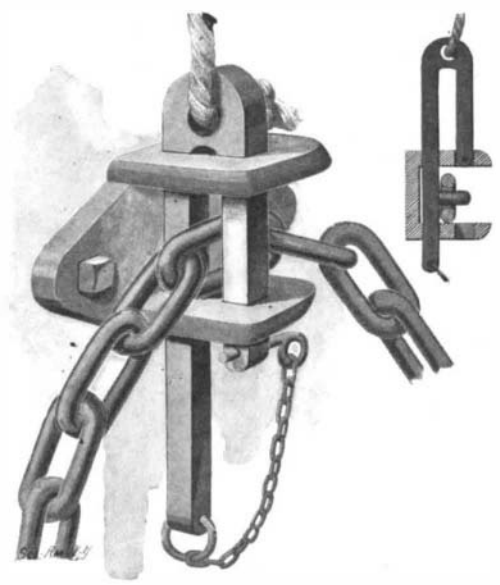
sea. Like an immense blanket the fog is drawn through the Golden Gate. Below the blanket all is gray and dreary; above, all is sunshine and delightful weather. The topography of the district is remarkable because of the close juxtaposition of the ocean, bay, mountain and foothills. The valley, level as a table, is 450 miles long and 50 miles wide, having afternoon temperatures of a hundred degrees or over and is connected by a narrow water passage with the



A SIMPLE CHAIN-STOPPER.

Pacific Ocean; the mean temperature of the water in this locality is 55 degrees. Thus within a distance of 50 miles in a horizontal direction there is frequently a difference of 50 degrees in temperature, where in a vertical direction there is often a difference of 30 degrees in an elevation of half a mile. Wherever the fog impinges on a condensing surface water trickles down, one side of the street is wet, the other dry. Under the trees, in the redwood canyons of the slopes of Tamalpais, the drifting fog after touching the leaves falls gently to the ground. A few hours earlier this water was in the Pacific; as vapor it traveled perhaps 1,000 feet upward. Then settling and chilled by the cold water surface it was carried inland as fog, and meeting in the leaf a modest but efficient rain-maker, turns to water and flows in part into the sea.

An attempt has been made at the Mount Tamalpais station to correlate the surface pressure conditions with fog. There are, however, many different types of fog. The conditions prevailing in winter, when tule fog formed in the great valleys drifts slowly seaward, are quite different from those prevailing in summer, when a sea fog is carried inland. A typical pressure distribution accompanying the sea fog has been recognized. In general a movement southward along the coast of an area of high pressure in summer means fresh northerly winds and high temperatures in the interior of the State, with brisk westerly winds laden with fog on the coast. The mountain, as might be supposed, is the driest station, the mean relative humidity being 59 per cent, while it is 83 per cent at San Francisco. Especially during the summer months is the difference noticeable, and doubtless it is this dryness which causes such an agreeable change of climate to visitors at this season. The average hourly wind velocity seems to increase with elevation, the values for the mountain station far exceeding those of the lower station. The maximum velocities recorded are respectively 9 and 47. We are indebted to Mr. McAdie for the remarkable pictures of fog which we illustrate.

Judging from published reports, the use of second-hand boilers by small manufacturers abroad is practically unrestricted, while the penalties in case of explosion are not severe. A boiler of the class mentioned recently burst in England; its age was unknown, as its history could not be traced, it having passed through several hands and used without any test as to its strength. Owing to defective construction and design it was said to have been safe when new for only 20 pounds per square inch, but was being used at 70 pounds when it blew up. The inspectors found that this latter event was due to carelessness, but fined the parties to blame for it only $10, possibly upon the ground that they didn't intend to do it.

A NOVEL CHAIN-STOPPER.

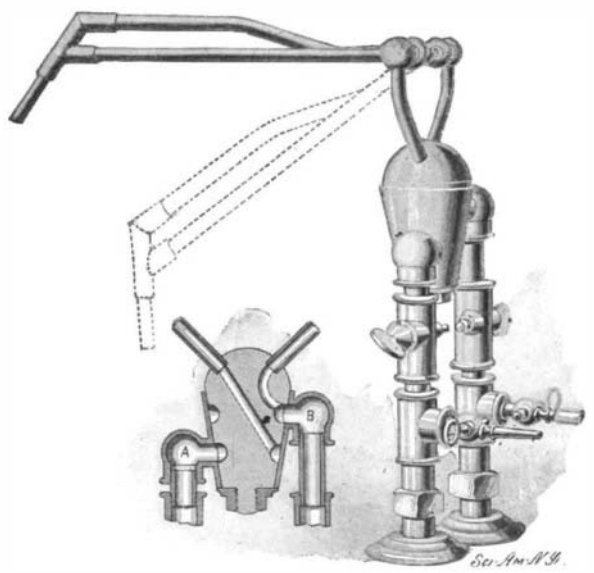
We present herewith an illustration of a simple chain-stopper invented by Mr. Michael A. Drees, of Peshtigo, Wis., by which a chain can be easily and effectively stopped, and which can be readily released, notwithstanding the strain to which the chain may be subjected.

The device comprises a body having oppositely arranged openings. The corresponding openings of the top and bottom lugs are in alignment with each other. These lugs are designed to receive the unequal legs of a stopper-bar. The two legs are connected by an eyepiece through which a rope is passed, whereby the stopper-bar can be withdrawn. The one leg of the stopper-bar is about twice as long as the other, so that when the stopper-bar is withdrawn to open position (see illustration) the shorter leg will be moved out of the space between the lugs. When the stopper-bar is moved to the locked position shown in the general perspective view, both of the legs will lie across the space between the lugs. One end of the chain is attached to the longer leg of this stopper-bar, the other end of the chain being provided with a key which can be inserted in an opening in the end of the shorter leg, so as to lock the stopper-bar in position. Thus locked, the two legs straddle the chain. When the stopper-bar is moved to open position, the chain is released.

AN IMPROVED BLOWPIPE.

The illustration herewith presented pictures a blow-pipe invented by John McLoughlin, of 253 Tremont Street, Boston, Mass., and arranged so that it can be quickly and conveniently adjusted to bring the flame to the desired point.

The blowpipe is mounted on a base on which two vertical pipes, *A* and *B*, are secured, the one supplying air and the other gas. Valves in the pipes regulate the flow. The upper ends of the pipes, *A* and *B*, support a valve-casing in which a valve-plug is mounted to turn. The valve-plug, as shown in the smaller figure, is formed with two annular ports, one of which is constantly in register with the air-pipe and the other with the gas pipe. From these ports channels lead to feed-pipes secured to the outer end of the rotatable valve-plug. These pipes are swiveled to pipes



AN IMPROVED BLOWPIPE.

opening into a blow-pipe nozzle. By reason of this construction the swivel connection and rotatable valve-plug form a universal joint, so that the blow-pipe nozzle can be brought into any desired position. The nozzle can be swung up and down, and can be turned with the valve-plug. The universal joint dispenses with the usual rubber-hose.

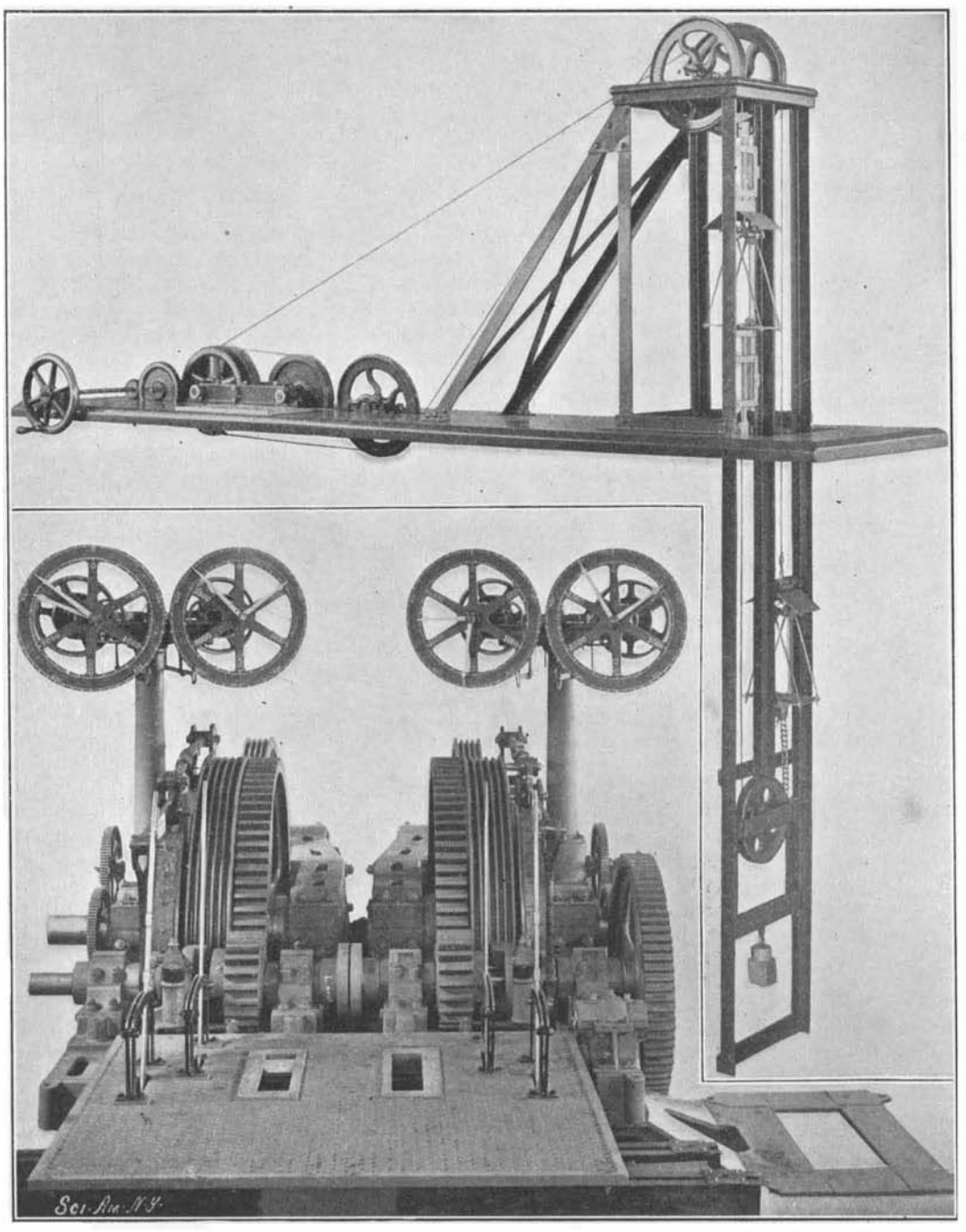
ELECTRIC HOISTS ON THE COMSTOCK.

BY LEON M. HALL.

With the advent of electricity on the Comstock it became necessary to take up the problem of hoisting from considerable depths by means of electrical energy, and after much research and a thorough investigation of the then existing electrical hoisting machinery, it was evident that in order to meet our conditions of service and power, we must procure something radically different from the usual run of such machinery. The writer then, after discussing the matter with the Risdon Iron Works, of San Francisco, decided on the system as described in this article, the ultimate result being the development, installation and successful operation of a continuous rope electric hoist, driven by means of a variable speed, three-phase induction motor.

The power for the Comstock is developed on the Truckee River, at a point near Floriston, thirty-three miles from the mines in Storey County, Nevada. The generating station is equipped with two 750 K. W., three-phase, 60-cycle, Westinghouse generators, and six 300 K. W. oil-cooled transformers. McCormic turbines are used to drive the generators and a close regulation is secured by means of Lombard governors. At the station the potential is raised from 400 volts to 24,000 volts, at which pressure it is transmitted over a double circuit of No. 4 hard-drawn copper wire. At the sub-station, in Virginia City, the potential is reduced to 2,300 volts, and in this form is distributed to the various mining companies. In the case of each hoist but one, namely, that at the C. & C. shaft, it is again reduced to about 450 volts.

The power is purchased of the Truckee River General Electric Company upon a continuous rate basis, the amount being fixed by a peak load of two minutes' duration. Under these conditions it has therefore been the endeavor of the mining companies to secure a hoist that will operate at the highest possible efficiency.



Model Showing Method of Operation.

ELECTRIC HOIST INSTALLED ON THE COMSTOCK.