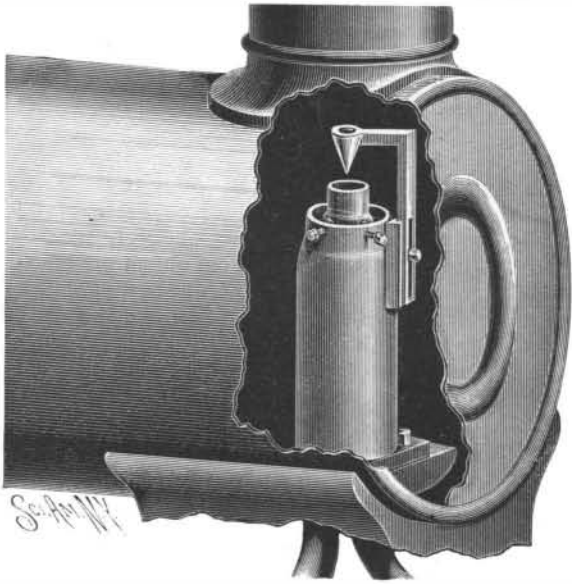


AN IMPROVED EXHAUST NOZZLE.

The improvement shown in the illustration is designed to enable a locomotive to use a larger exhaust opening, which may be placed nearer the stack, thus forming a milder and more continuous draught and avoiding much of the back blast on the fire, the milder draught also drawing less sparks through the flues, and facilitating the more complete combustion of the gases in the fire box and flues. The invention has been



UMHOLTZ'S EXHAUST NOZZLE.

patented by Mr. Charles W. Umholtz, of Bristol, Tenn. The stand pipe is connected as usual with the exhaust passages from the cylinders, and in its upper contracted end are held set screws engaging lugs projecting from the lower end of a nozzle held in the reduced end of the stand pipe, so as to form a space between the inner surface of the stand pipe and the lower end of the nozzle. Centrally above the nozzle is held an inverted cone secured to an arm sliding vertically in guideways on one side of the stand pipe, the arm being secured at the desired height by a set screw. The cone spreads the exhaust steam passing up through the nozzle, the spreading being increased or diminished by raising or lowering the cone. The use of the larger exhaust permitted by this improvement is also designed to afford relief from back pressure in the cylinders, and it is claimed that the device will effect a material saving of fuel.

THE HENRION DYNAMO.

The machine we illustrate is of French design and manufacture, being built by M. Fabius Henrion, of Nancy. The armature is of the disk type and the three pairs of parallel circuits are coupled together, so that only two pairs of brushes are required. Four or six may, of course, also be used. The frame of the machine is designed so that the top part can be lifted off, allowing the armature to be removed with ease if such a necessity should arise. One of the most interesting points about this machine is the system of lubrication employed. The bearings are kept well oiled by the ring method; the rings, however, are made with numerous perforations, so that they pick up more oil than the usual smooth form. The bearings also contain strainers, so that the machine not only carries its own self-acting lubricator, but also an oil filter for each bearing. These machines are wound for any desired output, and are frequently made to compound up to allow for the loss in the leads. —Industries.

Myrabolams.

The myrabolams of commerce consist of a mixture of the fruits of several species of *Terminalia*, the principal being *T. Chebulla*, *T. bellerica* and *T. citrina*. Myrabolams have for a long time been used in this country as a tanning material, and several species, particularly *T. bellerica* and *Chebulla*, are used as medicines in the East. Full descriptions of the uses of the fruits have been given by Hooper, Dymock, and others, and an analysis of the fruits of *T. bellerica* has lately been published.

It has been suggested that commercial myrabolams would form a useful addition to our list of astringent drugs, and it is with a view of ascertaining what

bodies, besides tannins, are present, and what advantages this drug possesses, if any, over other astringent substances, that this analysis has been attempted.

Dr. Apery (of Constantinople) has very strongly recommended the use of myrabolams in the treatment of dysentery and diarrhoea, and also considers the drug to be cholagogue. He describes its effects in the treatment of dysentery as very remarkable. — *L'Union Pharmaceutique*, 1887.

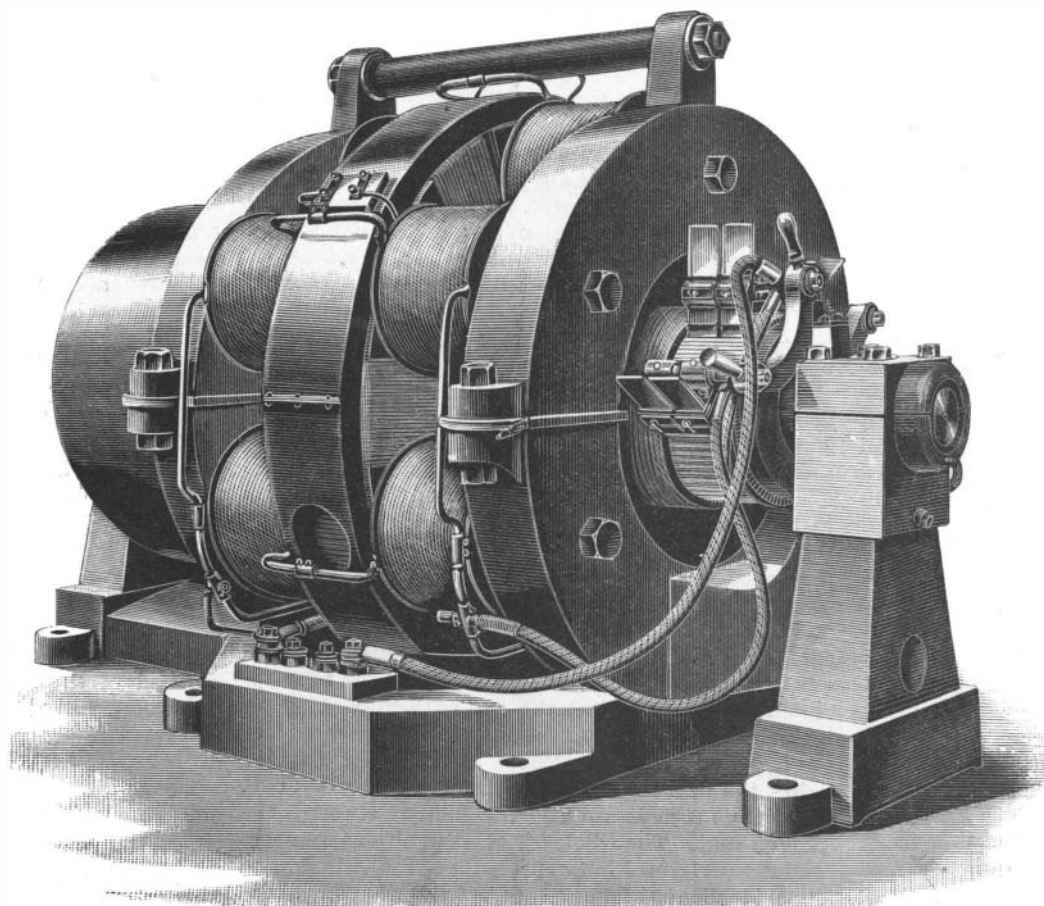
Protection Against Frosts.

The San Francisco *Chronicle*, in speaking of the disastrous freeze of last December and methods to prevent a recurrence of the disaster, says that a Mr. Everest, who was formerly engaged in manufacturing petroleum oils, has been experimenting for several months with other materials for burning in place of tar and brush, and has perfected an apparatus which it is claimed will prevent the frosting of fruit even when the temperature falls as low as 18 or 20 and remains there for several hours. This heating apparatus has been placed throughout Mr. Everest's eighty acre grove at a cost of over \$2,000 and is being adopted by several other growers. It will not be patented, and is a simple device that any horticulturist may prepare.

Briefly described, the contrivance consists of a 100 gallon iron cask on each acre filled with oil, from which two pipes run along between the rows of trees, with half a dozen elbows to the acre twenty feet apart, over which are flat sheet iron pans into which oil spatters and burns as it vaporizes. Burning at the rate of one gallon per burner every hour, an intensely hot flame is made, which rises several feet and creates also a dense smoke which acts as a smudge. The cost of the plant is about \$25 per acre, and the oil should not cost over \$7 an acre in the coldest winter. It is believed that this method will eventually be largely used, not only for citrus orchards, but also in growing winter vegetables wherever there is danger of frost. — *Florida Agriculturist*.

Log Hauling Apparatus.

One of the most unique mechanical devices resorted to of late is that for inclined and horizontal log hauling at the Hudson River Paper Pulp Mills. The arrangement consists of an endless detached chain running in a recess at the bottom of a trough, having special links with log teeth every five feet, and passing over sprocket wheels whose centers are a hundred feet apart. The head wheel is twenty-five feet above the foot wheel, and the head end of the chain swings and can be raised or lowered by means of a small winch to suit the depth of the water. The logs are floated to the haul-up and, as they come around the foot wheel, are caught on the teeth of the chain and



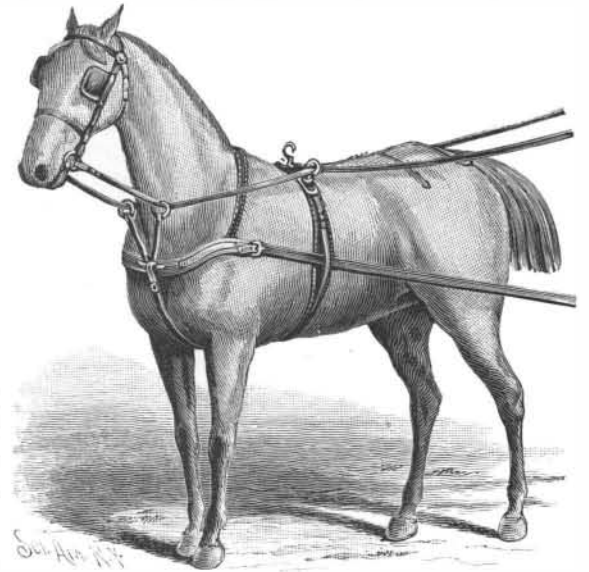
THE HENRION DYNAMO.

carried up the incline at the rate of one hundred and twenty-five a minute; on arriving at the top they are discharged into a horizontal log hauler, having head and foot wheel nearly six hundred feet apart, the whole being similarly constructed to the incline haul, the return chain supported by toothed idlers, and a deflecting piece is placed across the horizontal conveyor, by which the logs, elevated by the chain, are

thrown out of the trough and rolled over the side up on long skids. Great saving of time and cost is thus effected, twenty-five horse power being employed, though some of the logs are of immense size.

AN IMPROVED BREAST COLLAR.

With the collar shown in the accompanying illustration, the pulling strain is designed to be thrown on the animal's shoulder proper, the point of the shoulder



CAIN'S BREAST COLLAR.

being relieved from pressure, thus giving comfort to the animal and permitting walking or running with the greatest ease. The improvement has been patented by Mr. C. T. Cain, of Owensboro, Ky. The collar is connected near its rear ends with the neck strap, and at its ends with the traces, in the usual manner, and within the sheathing of the collar are permanently shaped metallic shoulder plates. The plates are formed of steel or spring brass, so that they will permanently retain their shape and yet yield sufficiently to be perfectly easy to the shoulder, each plate being bent edgewise vertically in one portion, and having its rear end inclined downward and rearward to align with the traces, together with a particular curvature and inclination at the forward end. The collar assumes the same shape as the plates, so that all strain on the point of the shoulder is removed and distributed higher up on the shoulder proper. The collar is left perfectly flexible between the shoulder points where it crosses the windpipe, and thus all liability of choking is avoided, while a much freer shoulder action is permitted than is possible with a metallic bar extending throughout the length of the collar as heretofore. The collar also looks easy and comfortable and is elegant and graceful in appearance.

The Leather Industry.

A separate building for shoe and leather exhibits, paid for by subscriptions of those engaged in these trades, is being constructed at Chicago, at a cost of more than \$100,000, and this building will contain, says the *Shoe and Leather Reporter*, not only illustrative exhibits, but gems of art. The possibilities of decorating with colored, varnished, embossed, satin, Japanese and Oriental fancy leather will all be tested by experts whose aim will be to excel in this new field. It is likely to open an era of embellishment which will bring leather into more general use in the household. The Japanese leather embossed with the strangely bedizened figures from real life in that country will be an artistic revelation. This material is as thin as paper, but possesses great toughness, and is soft and yielding to the touch. It is being used in European drawing rooms in place of textile fabrics, for inside curtains. This is a new use for leather. The walls of the official rooms will be sheathed with upholstery leather, and ceilings frescoed with appropriate designs. On the walls will hang more than two hundred pictures (full size and original colors), representing the shoes worn in every age.

A CERATE for wounds, cuts, sores, burns, scalds, and the like: Resin, $\frac{1}{4}$ pound; clarified beef suet, 3 ounces; boil a quarter of an hour; add 2 ounces beeswax; boil for a half hour longer, and allow to set.