

visible in all cases in which nitrate of silver has been used, may be obviated by the addition of a certain amount of copper salt to the argentic solution.

Nitrate of silver, 30 grammes; sulphate of copper, 2.5 grammes. Dissolve the two salts in 250 cubic centimeters of water, and add sufficient ammonia to dissolve the precipitate formed, and make it up to one liter.

An instantaneous dye may be made by steeping the hair in a solution of pyrogallic acid in acetic acid, and then in the argenti-cupric solution dissolved above. The hair should be allowed to dry partially after the application of the pyrogallic solution. By varying the proportion of the pyrogallic acid from one gramme to fifty grammes per liter, any tint may be obtained from light brown to black.—*Moniteur Scientifique.*

To Cleanse a Soiled Chamouis Leather.

Many workshops contain a dirty wash leather, which is thrown aside and wasted for the want of knowing how to clean it. Make a solution of weak soda and warm water, rub plenty of soft soap into the leather and allow it to remain in soak for two hours, then rub it well until it is quite clean. Afterward rinse it well in a weak solution composed of warm water, soda, and yellow soap. It must not be rinsed in water only, for then it would be so hard, when dry, as to be unfit for use. It is the small quantity of soap left in the leather that allows the finer particles of the leather to separate and become soft like silk. After rinsing, wring it well in a rough towel and dry quickly, then pull it about and brush it well, and it will become softer and better than most new leathers. In using a rough leather to touch up highly polished surfaces it is frequently observed to scratch the work; this is caused by particles of dust, and even hard rouge, that are left in the leather, and if removed by a clean rougy brush it will then give the brightest and best finish, which all good workmen like to see on their work.

DU'S PATENT MECHANICAL ATOMIZER.

[Continued from first page.]

contact with the revolving ring of rock. To compensate for the unavoidable abrasion, it can be inserted further in as may be found necessary, and in time, when worn out, may be replaced at very small cost, in two or three minutes' time. The broken material is fed into the shell, and falling in front of the plow bar is prevented by it from turning with the shell, and banks up in a pile, which is kept in a state of rest; meanwhile the ring or belt of rock before alluded to is passing under this pile, and the two surfaces are subjected to severe attrition, which reduces them to a powder in an exceedingly short space of time.

The dust produced by this wearing action of the particles of rock among themselves is removed from the mill by means of a vacuum induced by a small rotary exhauster, which sucks the air out of the shell of the mill, by which means the ground rock is floated out of the shell, and conducted by a pipe to a settling chamber underneath the floor. Here the velocity of the air current is so greatly reduced that the particles of dust are deposited, and by accumulating, gain weight enough to open the valve in the bottom of the chamber, and run out into a screw conveyor, or any proper receptacle.

Meanwhile the air, relieved of its load of ground material, although still holding in suspension a certain amount of the finest particles of dust, passes through the exhauster, and thence to a chamber consisting of a frame covered with coarse cloth, technically termed a "dust chamber." This portion of the apparatus may be located in any convenient place, and serves as a settling chamber for the finer particles of dust which were not deposited in the first chamber. To compensate for the air taken out of the shell, a pipe is connected from the dust chamber to the "return air port" of the mill, by means of which a "belt of air," so to speak, is formed, which is continually entering the mill, where it is laden with dust, and upon coming out, deposits it in the settling chambers, and again enters the mill on a similar errand. The amount of rock ground with the Duc atomizer in a given time, and by the application of a given power, is much greater than the output of burrstones or other devices used for that purpose, and the degree of fineness much more satisfactory; the ground material is quite uniform in grade, due to the fact that the exhauster maintains a constant amount of vacuum sufficient to draw from the mill only such particles of material as have attained the requisite degree of fineness.

The usefulness of this machine is not limited in its adaptation to phosphate rock alone, but it has worked successfully on ores, quartz, marble, soapstone, etc., etc., and in fact may be employed for any refractory material which it is necessary to reduce to a powder.

This apparatus has been patented in the United States, Great Britain, and the Canadas, and is the property of the Continental Works, Brooklyn, N. Y., with the exception of the State of South Carolina, which latter territory belongs to the "Charleston Mechanical Atomizer Company," of Charleston, S. C., and the said company reserves the right to sell all

the machines which may be required in their territory, the Continental Works being the sole manufacturers.

Either party in interest will be pleased to furnish circulars giving detailed information, prices, etc., to parties making application personally or by mail, as above.

IMPROVED KNOCKDOWN BARREL.

It has been the custom of shippers of goods packed in barrels and casks to seldom, if ever, reship the package for use the second time, on account of the space occupied in car

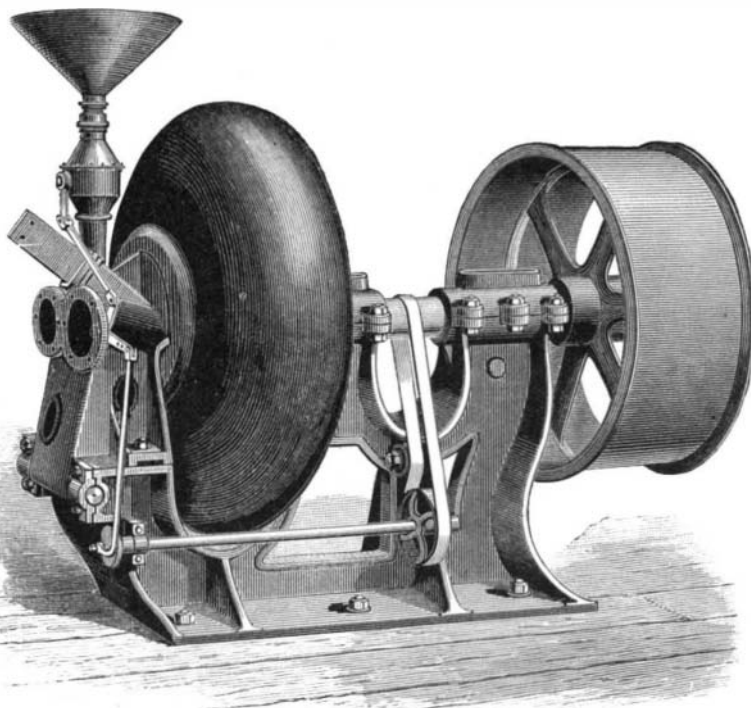


ADAMS' KNOCKDOWN BARREL.

or wagon, it being too great to admit of transportation with any profit to the shipper; in fact, in many cases, it is less expense to buy the casks new than to pay freight on the old packages.

The engraving shows an improved separable barrel lately patented by Mr. Robert F. Adams, of Chariton, Iowa, which can be taken apart for shipment, so that the package will occupy no more space than the material from which the barrel is formed would occupy.

In carrying the invention into effect the inventor forms the cask in the old method, and the hoop or hoops on each end are attached to the cask by nails or otherwise, and may be divided into two or more arcs. The sections of the barrel thus fastened together may be put together to form a



DU'S MECHANICAL ATOMIZER.

barrel by workmen, whether skilled or not, by driving the whole hoops, as in the old method of making barrels.

Eight or ten barrels made in this way can be knocked down and packed in the space required for a single complete barrel.

The advantage of this construction will be readily comprehended by makers and users of the ordinary barrel. A quantity of barrel sections is packed in a case for shipment, and the heads and hoops are placed on top.

The additional cost of this barrel over the ordinary barrel is insignificant compared with the immense saving in barrels that can be effected by this construction.

Further information in regard to this useful invention may be obtained by addressing the inventor as above.

RECENT INVENTIONS.

A novel mechanical musical instrument has been patented by Mr. Azro Fowler, of New York city. This invention relates to wind musical instruments that are operated manually by keys, or are played or controlled by means of one or more sheets or strips of paper or other suitable material perforated to represent the different notes or sounds it is desired to produce, and caused to automatically pass over air ducts, which, according as they are opened by the perforations in the paper, cause the reeds or other sounding devices to be played as desired; and the invention has special reference to the pneumatic action of the instrument.

In the manufacture of turpentine the crude article containing chips, bark, twigs, and other foreign substances is introduced directly into the still, and in the process of distillation the extractive coloring matter of these substances discolors the residual rosin, thereby depreciating its commercial value. Much time and labor are also spent in dipping or straining the chips, etc., from the liquid rosin, and the fire risks are greatly enhanced by the taking fire of the hot saturated chips as they are removed from the still, most of the conflagrations of turpentine stills originating from this cause. Mr. Allen Garner, of Americus, Miss., has patented an apparatus for the manufacture of turpentine and rosin which will avoid these difficulties, and will economize time and labor and lessen the costs and risks in distilling turpentine, and will produce a cleaner and more valuable rosin.

Mr. Anson J. Bacon, of Hallowell, Me., has patented an improved holdback, constructed so that the first resistance to the forward pressure of the vehicle will be elastic or yielding, so as to prevent any jar to the vehicle or horse.

An improved tire setter and cooler has been patented by Mr. William W. Whitmore, of Defiance, O. This invention relates to improvements in that class of tire setters and coolers in which a table carrying a wheel is raised and lowered in a tank containing water to cool and set the tire. In this device the center post ordinarily employed is dispensed with, and the operator is readily enabled by means of a lever to immerse the table and wheel in the water in the tank and hold it in any desired position.

Mr. Melville J. Fenwick, of Cottage Grove, Oreg., has patented an improved washing machine. The washing machine is provided with a rubbing cylinder attached to the lower ends of two connected rocking arms loosely mounted on a shaft of the machine, which arms also carry at their lower end an additional rubbing block, on which the clothes are held by a clamp bar provided with two arms fitting in sockets containing springs for pressing the clamping bar on the block.

Where Buttons Come From.

The button trade of New York is estimated at from eight to ten million dollars a year. Last year the importation of buttons exceeded three and a half million dollars, the aggregate for the four years just passed being but a little short of thirteen million dollars. At American rates of wages many of the imported buttons could not be put upon their cards for the price they sell for.

Glass buttons are made mostly in Bohemia, and children are largely employed at the work, which they do as quickly and as neatly as adults. The children get ten cents a day, men from forty to fifty cents, and women a little less. Pearl buttons are imported from Vienna, where they are almost exclusively manufactured; and the all-important shirt buttons are received mostly from Birmingham, England, where the majority of metal buttons are likewise procured. The most extensive of all the button manufacturing, however, is that of the Parisian and Berlin novelties. In one manufacturing village near Paris, where there are from 5,000 to 6,000 inhabitants, all the working people are engaged in making the agate button, which, even with thirty per cent duty added to the cost, sell, when imported into this country, at the extremely low figure of thirty-one cents per great gross. The material alone, it is reported, could not be procured here for double that amount.

While American manufacturers make no attempt, and probably have no desire, to compete with European producers employing hand processes, they excel in making bone, composition, brass, ivory, and gold buttons by machinery, and are able to export considerable quantities of these styles. In Providence, R. I., for example, sleeve buttons and jewelry buttons are largely manufactured expressly for exportation.

New Electrical Meter.

At a recent meeting of the London Physical Society, Mr. C. Vernon Boys read a paper "On a New Current Meter." The rate of a pendulum clock depends on gravity, and is proportional to the square root of the strength of gravity. That of a watch depends on the strength of the hair-spring, and is proportional to the square root of its strength. The force due to an electric current is proportional to the square of the current strength. Hence if part of an electric circuit is capable of vibrating under electro-magnetic force, the speed of vibration will be proportional simply to the current