NEW ROTARY PUMP.

We extract from the *Revue Industrielle* the annexed engraving of a new rotary pump, which is quite simple in construction, and which, our contemporary states, has successfully withstood quite severe tests.

Placed eccentrically in the cylinder is a drum, as shown in Fig. 2, to which are hinged three bronze pallets which close into recesses in the drum. These, as the drum rotates, draw in the water through the ball valve in the suction pipe below. The drum shaft is mounted independently of the pulley shaft, Fig. 1, so that any strain on the latter, by the belts, will not tend to throw the pump mechanism out of line. The connection between the shafts consists simply of the end of the drum shaft entering a socket in the end of the pulley shaft.

The pallets may be easily removed without taking the drum from the cylinder. The joints of the cover are packed by rubber packing, which fits in a groove made half in the cover and half in the cylinder.

Fig. 1.

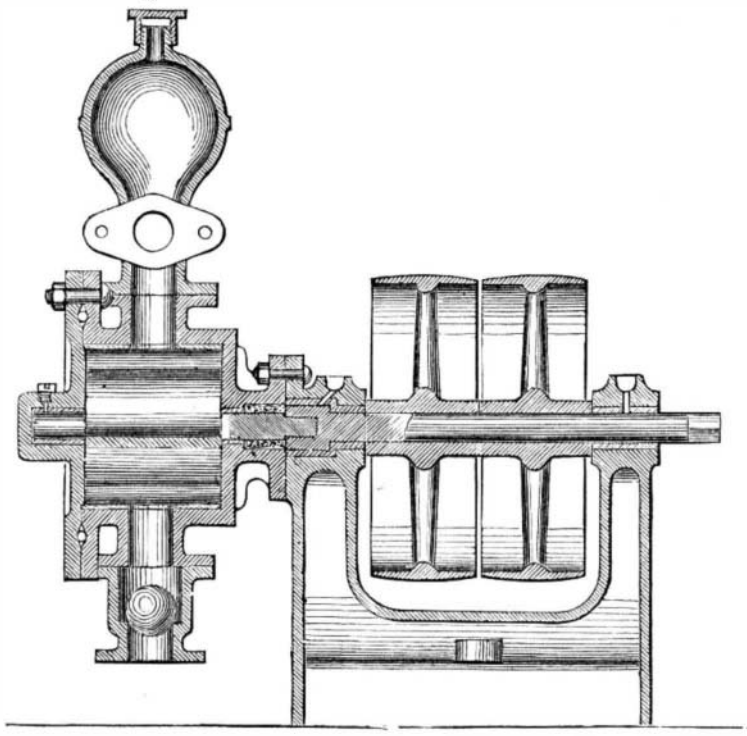
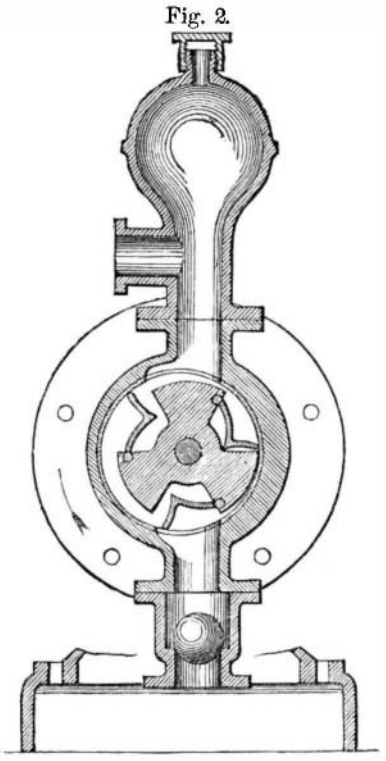


Fig. 2.



HOUYOUX'S ROTARY PUMP.

Dyeing Raw Cotton.

The following is considered the best and easiest way for dyeing raw cotton. Boil with 22 lbs. extract of logwood for 100 lbs., till it is all well penetrated, then dry; then boil slowly with 10 lbs. chromate of potash and 5 lbs. soda crystals; make run the liquor, take out, and keep over night, or one or two days; then wash well. That is the best and fastest black, and stands well.

A NEW PHYLLOXERA REMEDY—DECORTICATION.

It was recently announced in the French Academy of Sciences that the decorticating or removing of the bark from grape vines is a valuable preventive of phylloxera ravages, and that the vines thus treated also soon showed very perceptible signs of improvement in vegetation. M. Sabaté now gives, in *La Nature*, some positive facts regarding the efficacy of this process, based on actual trials in his own vineyards. He states that a plot of about 20 acres had its vines (white grape, age 60 years) nearly destroyed in 1875. During the winter of 1875–6, the vines were barked during the coldest weather. They have since become in a flourishing condition, and last autumn yielded an amount of grapes double that of the preceding year; and 48 acres of other vines (red grape, aged from 15 to 20 years) were similarly treated in February, March, and April. Since then they have not been attacked, and the old phylloxera points of lodgment have not enlarged, while a far larger yield was obtained. In general, the vegetation in both of these vineyards offered a striking contrast to that in adjoining ones where decortication had not been practised. Although the vines in the latter were planted in fully as rich soil, and were identical in variety and in age, they are now as badly attacked as at any time during the past two or three years. Indeed, their production is lessened, and is scarcely 60 per cent of that of last year. These facts have attracted official notice, and a committee from different French vine growers' associations have lately undertaken and completed an extended course of experiments based upon them. These substantiate the conclusions drawn from the foregoing, and also show the further benefit that, by removing the bark, a large number of harmful insects, which take refuge therein in winter, are at the same time destroyed.

Fig. 1.—SABATE'S DECORTICATING GLOVE.

The modes of decorticating the vines are represented in the annexed illustrations. The workman wears a glove, Fig. 1, made of mail or rings of galvanized iron. It weighs about 20 ozs., and with it a man can easily bark 500 large three-branched trunks per day. Fig. 1 shows how the bark is removed by rubbing the branch longitudinally. In order to reach crotchets and sharp angles, the bow, shown in Fig. 2, is used, the cord being a twisted line of galvanized iron wire.

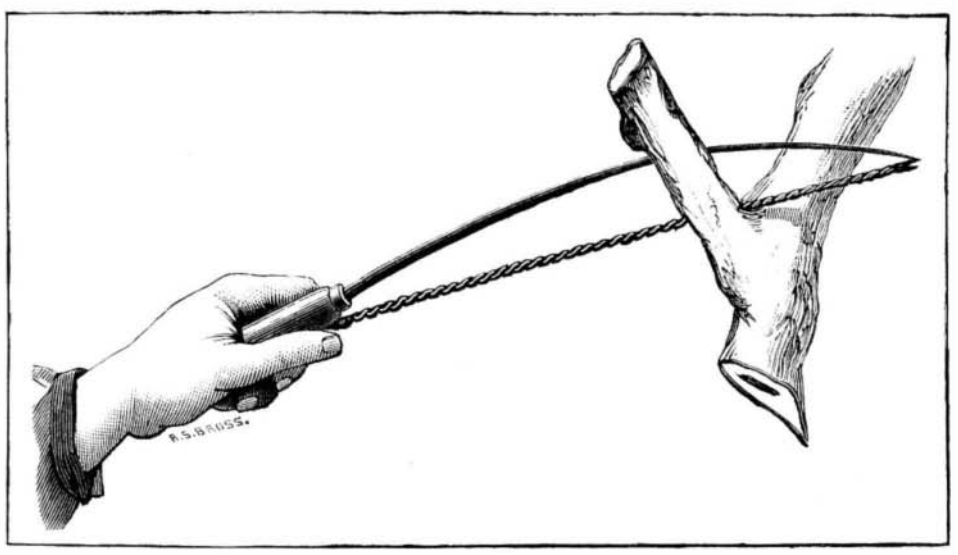


Fig. 2.—SABATE'S DECORTICATING BOW.

A Machine Switchman.

About as curious a railway signal as we have ever seen has recently been patented through the Scientific American Patent Agency by Mr. J. D. Hughson, of Prairie City, Ill. This inventor believes that, where an engineer might fail to heed the indication of a semaphore or some other purely mechanical apparatus, he would be sure to notice the frantic gestures of a man posted beside the track. As men of flesh and blood cannot probably be found who would be willing to stand on a high pedestal for indefinite periods of time and wave their arms at exact intervals, a machine man has been contrived who flourishes a flag, hammers a bell, and displays a changeable light in his hat with unfailing regularity. The man owes his movements to clockwork operated by weights, and the latter are controlled by electricity. When a train passes, it moves a little stop beside the track, which, by a mechanical connection, shifts a switch so that the current from a main line of telegraph wire is diverted into a short circuit. An electro-magnet inside the machine man is thus excited; and as it attracts its armature, the latter releases a detent. The weights then descend, and the man waves his flag and pounds his bell, while the light on his hat changes to red. When the train has passed, the current is broken from the short circuit, but the man keeps on his motions until a wheel in his interior completes its revolution and thus allows the detents once more to engage. Of course the time during which he waves his flag, etc., is long enough to allow the train that has passed to travel a considerable distance.

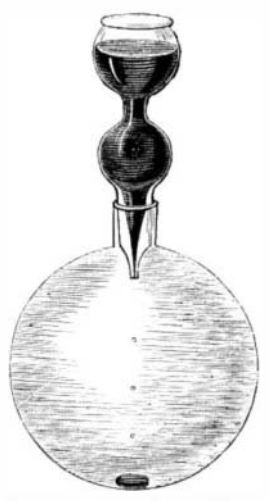
The Coffee Photographic Process.

A correspondent in Switzerland lately sent some examples of this process, which, by reason of their depth, vigor, and richness, were equal to the best wet-plate photographs; and now both M. Haakman, the President of the Photographic Society at Amsterdam, and M. Victor Angerer, a well known Viennese photographer, bear testimony to the efficacy of the process. M. Haakman says he has given some attention to dry plates, for, as he practises photography simply for pleasure, these are generally more convenient to use than wet films. He has tried, he tells us, tannin, tea, tobacco, morphine, and several other substances in the preparation of his dry films; but none of these, to his thinking, afford such clean and satisfactory films as coffee.

M. Haakman prepares his plates in the simplest manner; and although we have several times published formulæ in regard to the production of coffee plates, our readers may like to know the precise plan followed by M. Haakman. His coffee solution is made up of: Boiling water, 6 cubic inches; pure Java coffee (burnt), 77 grains; white sugar, dissolved in a little water, 39 grains. This infusion, when cold, is poured twice over the sensitized collodion films, which are then dried.

A NEW BATHOMETER.

We extract from *La Nature* the annexed engraving of a new and simple instrument for measuring great sea depths. It is the invention of Dr. H. Fol, and consists of a spherical glass reservoir filled with a liquid very slightly compressible —water, for instance, or, better still, ether. The only orifice to the vessel is a capillary tube which communicates with a small reservoir above, which is filled with mercury. The latter, at the presumed temperature of the water at the sea bottom, should just stand at the level with the orifice in the pointed stopper inserted in the large reservoir. The upper surface of the mercury is exposed to contact with the sea water.



In using the device, it is simply lowered by a sounding line. The liquid within the large reservoir will be compressed as the apparatus descends, a given amount for each atmosphere of pressure, and a corresponding quantity of mercury will escape through the orifice and sink to the bottom of the large reservoir. This mercury on the apparatus, being hoisted, is accurately weighed, and its weight indicates exactly the pressure to which the device has been submitted. The pressure known, the depth of water is easily determined.

Do not Allow the Frogs to be Pared.

The frog of the foot of every horse is the natural support of the foot, and should never be cut away except to remove the rough edges which occasionally appear from common wear. At a late meeting of the farriers and horseshoers in Wilmington, Del., there was a great deal said in condemnation of the manner in which horses are shod, especially in the rural districts. A lecturer, a veterinary surgeon (according to the New York *Herald*), said that "the frog of the foot was often pared away so artistically to make a neat job that the tendon or muscle that extended down the leg, over what is known as the pulley bone, and gave the foot its motion, was often injured, and then the horse would be weak in the legs, and blunder. He severely characterized the habit of burning the hoof with a red hot shoe to make it fit, and said there ought to be a law passed to hang any blacksmith who would use red hot shoes in this way. The shoe should be fitted to the shape of the foot, rather than the foot fitted to the shoe."

AN electric battery, famous because it was once owned and operated by Benjamin Franklin and other distinguished philosophers, has been in use at Dartmouth College for years, and is now employed almost daily for class-room experiments.