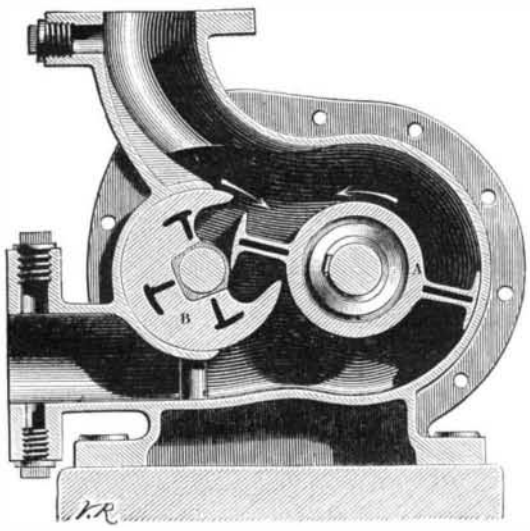
THE GREINDL PUMP.

In establishing the Greindl pump, the inventor has had in view the great excess of driving power over useful work done required by most pumps in use, arising from two principal causes:

1st. The inertia of the water, or the difficulty of putting it into motion again after it has been brought to a rest, and the consequent reduction of the effective pressure. 2d. The necessity of imparting at certain moments a high velocity to a considerable mass of water, the production of this velocity requiring the expenditure of a great amount of power, of which only a small portion is given out again as useful effect.

It is clear that if these two sources of difficulty are got rid of, a near approach is made to perfect efficiency, that is, to an equality between the theoretical driving power required and that which is utilized in the work done. Thus the invention of the Greindl pump has had its origin in carefully worked and theoretical considerations.

The pump consists of a chamber within which work two



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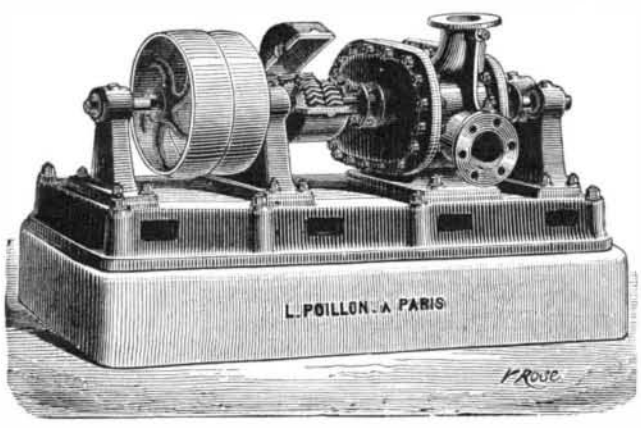
cylindrical drums, A and B, of equal diameter, running in contact with each other on parallel shafts. One of these drums, A, carries two radial vanes or blades acting as pistons, which as they revolve enter alternately into a recess of epicycloidal section extending along the whole length of the other drum, B. The shafts of the drums are geared, so that the recessed drum, B, makes two revolutions to one of the bladed drum, A, thereby enabling the single recess in the quick drum to serve for the two blades on the slower. The inlet and outlet passages are arranged in such a manner as to present everywhere the same sectional area throughout the entire course of the water, in order not to impede its movement in any way during its passage through the pump. In consequence of the continuous motion of the stream of water, any foreign solid substance can pass through the pump without occasioning either a stoppage or a breakage. The blades of the slower drum strike the water without any perceptible shock. Lateral pockets in the end cover plates afford ample space for the water to escape through at the moment when the space left between the blade and the recess threatens to be insufficient for that purpose.

As there are no springs, no leathers, and no packings of any description to cause friction, the wear is reduced to a minimum, and thereby also the driving power. The pump is, moreover, one of the simplest and least expensive to erect. The regular working speed being very moderate, the pump is not at all liable to get out of order; a pump de-



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livering 550 gallons per minute runs at only 140 revolutions per minute of the bladed drum.

Contrary to what is the case with centrifugal pumps which cannot draw air, the Greindl pump can draw gases and discharge them as effectually as liquids. It can thus in sugar refineries take the place of air pumps with valves for the boiling and evaporating apparatus, and even of carbonic acid gas blowers. It is also used to elevate molasses and juices having the consistency of paper paste, and it is fast becoming in general use in all branches of industry where a reliable pump is required.

This pump is patented in the United States, and further information will be furnished by Mr. E. Ferrand, Detroit, Mich., attorney for Mr. L. Poillon, the owner of the patents.

A Wonderful Substance.

Among the most interesting developments which have followed in the wake of the discovery of petroleum is the immense trade which has sprung up in ozokerite, or ozocerite, as Webster has it. No fairer substance ever sprang from most unpromising parentage than the snowy, pure, tasteless, opalescent wax which is evolved from the loud smelling, pitchy dregs of the petroleum still. The *Mining Review* thus sums up the many uses to which this remarkable substance is applied: This comely, impressionable article, with all its smooth, soft beauty, defies agents which can destroy the precious metals and eat up the hardest steel as water dissolves sugar. Sulphuric and other potent acids have no more effect on ozokerite than spring water. It is alike impervious to acid and to moisture. Its advent seems to have been a special dispensation in this age of electricity.

Every overhead electric light cable or underground conduit, or slender wire, cunningly wrapped with cotton thread; all these owe their fitness for conducting the subtle fluid to the presence of this wax. And in still more familiar forms let us outline the utility of this substance. Every gushing school girl who sinks her white teeth into chewing gum chews this paraffine wax. Every caramel she eats contains this wax, and is wrapped in paper saturated with the same substance. The gloss seen upon hundreds of varieties of confectionery is due to the presence of this ingredient of petroleum, used to give the articles a certain consistency, as the laundress uses starch. So that a product taken from the dirtiest, worst-smelling of tars finds its way to the millionaire's mansion, an honored servitor. It aids to make possible the electric radiance that floods his rooms; or, in the form of wax candles, sheds a softer luster over the scene. It polishes the floor for the feet of his guests, and it melts in their mouths in the costliest candies. For the insulation of electric wire, paraffine wax has to-day no successful rival, and the growth of the demand for this purpose keeps pace with the marvelous growth of the electric lighting system. A single Chicago firm buys paraffine wax by the car load. Its price is but half that of beeswax, and yet the older wax yields readily to sulphuric or other acid, this being a test for the presence of beeswax in paraffine. The demand for paraffine for candles as yet heads the list.

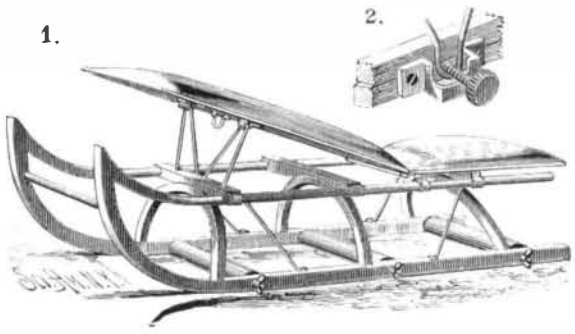
Then comes the needs of the paper consumers. In 1877 a single firm in New York handled 14,000 reams of waxed paper. Not only for wrapping candy is this paper valuable, but fine cutlery, hardware, etc., incased in waxed paper is safe from the encroachment of rust or dampness. Fish and butter and a score of other articles are also thus wrapped, and there seems literally no end to the uses found for the paper saturated with this pure hydrocarbon. In the chemist's laboratory it is invaluable as a coating for articles exposed to all manner of powerful dissolvents; brewers find it a capital thing for coating the interior of barrels, and the maker of wax flowers simulates nature in sheets of paraffine. And yet, until Drake drilled his oil well in 1859, the existence in this country of this boon to civilization was unsuspected, and it lay in the depths of Pennsylvania rocks, where thousands, possibly millions, of years ago it was stored by the hand of an all wise Creator.

Marvelous Horsemanship.

A St. Petersburg correspondent, writing to the London *Standard*, says: "This morning I witnessed a wonderful display of horsemanship. It took place in the Petroffsky Park. Here, in the presence of the Grand Duke Nicholas, and most of the foreign officers and guests, the regiment of Cossack Guards went through an extraordinary series of exercises which threw the most daring feats of the circus into the shade. The entire regiment passed at full galop, in loose order, with many of the men standing upright in their saddles, others upon their heads with legs in the air, many leaping upon the ground and then into the saddle again at full speed, some springing over their horse's heads and picking up stones from the ground, and yet regaining their seat. While performing these feats all were brandishing their sabers and firing pistols, throwing their carbines into the air and catching them again, and yelling like maniacs. Some men went past in pairs, standing with a leg on each other's horses—one wild fellow carried off another dressed as a woman. The effect of the scene was absolutely bewildering, and it seemed as if the whole regiment had gone mad. Upon a signal being given, the regiment divided into two parts. One rode off; then halted and made their horses lie down on the ground lie beside them, waiting as in war the approach of the enemy. The other section of the regiment then charged down, and in an instant every horse was on his feet, every rider in his saddle, and with a wild yell they rode at their supposed enemy. When the maneuvers were over, the regiment rode past, singing, and uncommonly well together, a military chorus. Altogether, it was a marvelous exhibition of daring horsemanship, and one hardly knew whether to admire the docility and mettle of the steeds or the skill and courage of the riders. All the foreign officers and guests were no less astonished than delighted."

A NOVEL SLED.

The rear section of the seat is fixed to the sled and is about one-third of the total length, while the forward section is hinged to the front edge of the rear one. To the under side of the forward section is pivoted an M-shaped brace, at the V-shaped portion of which is formed an eye. In front of the brace and projecting from the bottom is a loop. On the rear side of the front crossbar of the sled is fastened a clip, which holds a screw. Rollers, fitting between the runners, are mounted loosely on rods that are held in place by winged nuts screwed on the ends. As the movable section folds down, the brace folds against its under side and the loop passes between the clip and the crossbar, being held in place by the screw. When the section is raised, as shown in Fig. 1—the end bars of the brace resting upon the crossbar and the eye being held in the clip by the screw—the sled is less dangerous and more convenient than the common ones. The rollers can be easily removed and replaced; but when so provided the sled can be used indoors, on sidewalks, etc. This invention has been patented by Mr. Antonio Carra-



CARRARA'S NOVEL SLED.

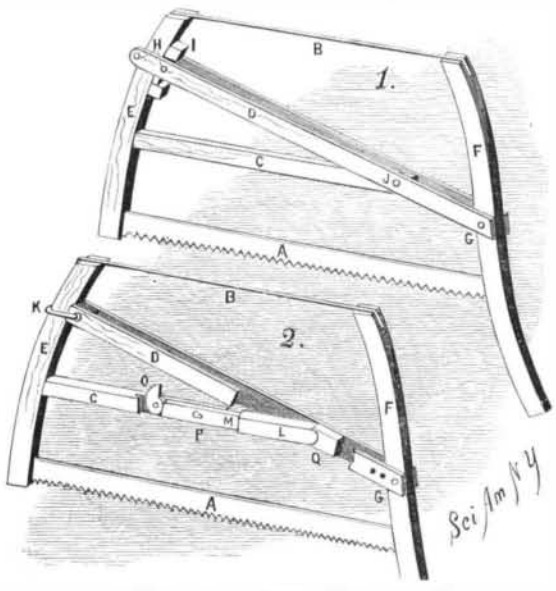
ra, and further particulars may be obtained by addressing Mr. A. Girardot, of 35 East Kinney Street, Newark, N. J.

The Blowing Adder.

The snake known as the blowing adder was formerly common in the meadows of Orange County, N. Y., but is now very rare. It is a beautifully marked snake, growing to three feet in length, and receives its name from its habit of laying its head close to the ground when disturbed and rapidly inflating or spreading it out until the head becomes twice its usual size, when the air is blown out of the snake's mouth with a noise like escaping steam. The snake is said to be poisonous. The first one that has been seen in the county for a long time was discovered by George Springstead, on July 20 in the town of Wawayanda. He smashed its head with a club, when he was surprised to see a young snake crawl out of the dead one's mouth. He cut the old snake open and found 75 young ones, four inches long, inside of it and killed them.

IMPROVED BUCK SAW.

In an invention lately patented by Mr. Myron Case, of Kasoag, N. Y., there is arranged, in place of the usual middle bar, a combined brace and strainer consisting of a thrust bar, C (Fig. 1), pivoted, near its end, to the lever bar, D, which is pivoted to the end bar, F, and extended diagonally to the upper end of the end bar, E, with which it is connected by a suitable binding device, so as to be shifted along and secured at any point. The bar, D, consists of two parallel parts provided with a connecting pin each side of the bar, E, a wedge, I, to hold the bar in any position, being placed between the end bar and pin, H. The bar may be secured by a grip yoke, K, Fig. 2. To take



CASE'S IMPROVED BUCK SAW.

up the slack the bar, C, may be made extensible, with a cam, O, pivoted on one part and bearing against a shoulder on the other part, so that the bar may be extended readily at any time by shifting the cam a little. The cam is set in a slot in one of the sections of the bar, in which slot a bar, M, is located with one end against the face of the cam, the other end being connected with a pin, P, extending through slots in the sides of the other section.

Between the two parts of the bar, D, is held a block, Q, formed with a concave shoulder in which the bar, L, rests. The bar, D, may have a series of holes for shifting the pivot pin, J, along it.