

PATENT GEAR-DRESSING MACHINE

We illustrate herewith a new machine for dressing teeth of gear wheels, either of iron or wood, or made bevel or spur. To bevel wheels it is claimed to give a perfect reducing cut, making the small end of the cog the same proportionate shape as the large end. The motion is transmitted to the tool block by a central shaft, permitting the radial bar that carries the tool to be swung to any angle from 0° to 90°. It is also hinged, so as to permit of a vertical movement. The form is placed under the bar, and by moving it to or from the center, wheels of different pitch can be planed with the same form.

To dress spur gears, the head is moved crosswise on the frame, the bar is swung to 0°, or parallel to the spindle on which the gear is chucked, the form is placed under the tool holder, and the latter is fed over it. To dress wood gears and patterns, a bracket, which holds a thick circular saw, is held in the tool post; it is driven from a radial countershaft overhead, receiving a quick rotary motion and reciprocating at the same time. It is fed over forms the same as if planing iron, only much quicker, as the saw cuts both ways, the feed being continuous.

The machine is constructed so as to plane the smallest pinion as well as wheels or the full capacity. The gear to be planed is chucked on the overhanging end of a spindle, and on the other end is the index wheel, which is accurately spaced. The head which carries the spindle can be moved to or from the center of radial bar, for the purpose of adjusting the gears to be planed, so that the radial lines terminate at the proper point. The end of the radial bar is laid out in degrees. On a wheel that the angle on pitch line is 60°, by planing the pinion on 30° it will, it is claimed, be perfect. Any imperfections of patterns or turning lathe are corrected in the dressing. In dressing wood gears the turning of the face and ends is done in the planer and at the same time that the teeth are shaped.

For further particulars address the manufacturer, Mr. William Gleason, Brown's Race, Rochester, N. Y.

Atmospheric Absorption of Solar Forces.

M. Marchand states that during the vertical passage of the sun's rays through the atmosphere, they are despoiled of 74 per cent of the chemical power which they possessed at the moment when they reached the outer boundary of the aerial ocean. According to the experiments of Bouguet, Pouillet, and others, under the same conditions the rays lose 13 per cent in illuminating and calorific power, so that it would appear that the calorific and chemical influences of light are absorbed by the atmosphere under very different conditions.

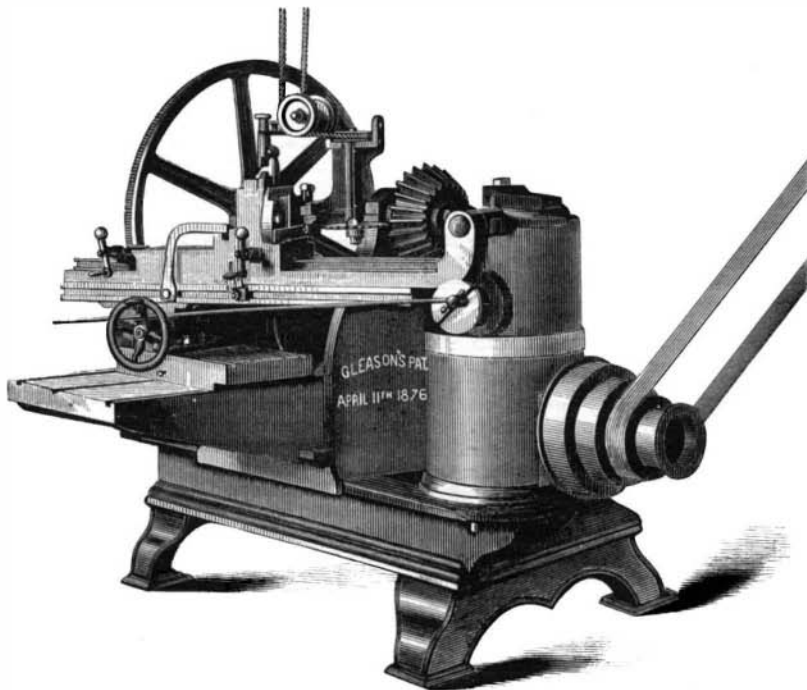
AN IMPROVED GANG PLOW.

The implement shown in the accompanying illustration is one of the new quadruple gang plows manufactured by Messrs. Howard & Co., of Bedford, England, who are manufacturers of convertible plows. It combines the functions of two or three plows in one, and is adjustable for a variety of work, the parts being constructed with a view to removal or alteration in arrangement at short notice. As a gang plow many advantages are claimed for it, principal among which are lightness, facility of repair, and the readiness with which the depth of the plowing may be regulated. The latter is effected by the long lever as the implement proceeds, without stopping the team, and at land's end the same lever lifts the four plows clear of the ground to facilitate turning. In this and other respects it resembles the better type of gang plows made in this country, and it is especially intended for the rapid shallow plowing which is preferred in the West. The manufacturers designed it, we believe, for the East India market.

A ROYAL STREET CAR.—A handsome car is being built in this city for the use of Dom Pedro in his trips between his country seat and his palace in Rio Janeiro. It is about the size of an ordinary car, but, owing to its elaborate fittings, will cost about three times as much. Special devices are introduced to insure perfect ventilation. The same firm are also building a lot of cars for the Finsbury Tramway of London. They are provided with top seats, which are self-closing by means of a spring.

Telephone Improvements.

M. Maiche states in *Les Mondes* that he has succeeded in suppressing the peculiar metallic quality imparted to the voice transmitted through the telephone by substituting for the metallic diaphragm a rubber membrane about 0.4 inch in diameter by 0.04 inch in thickness, to the center of which a disk of tinned iron of the same thickness and about 0.1 inch less in diameter is attached. In face of the magnet the rubber is exposed, over an area a little larger than that of the face (we infer from M. Maiche's description that this transforms the disk into a ring), and the membrane is brought to within 0.04 of an inch of the magnet. M. Maiche claims in this way to realize two apparently antagonistic conditions, namely: 1. A thickness of



GLEASON'S GEAR-DRESSING MACHINE.

iron sufficient to react on the magnet with sufficient energy, and to develop sufficiently intense induced currents; 2. A vibratory sensibility, which allows of the reception of very weak sounds. The voice heard, moreover, is identically similar to that of the speaker talking over a distance of a few yards. There is no alteration in timbre, and all the characteristic qualities are preserved.

M. Maiche has also found that long magnets, some 16 inches in length, on which wire was wound over a third of their extent with few coils, are much more sensitive than short magnets. The distance to which sound may be transmitted depends principally on the size and length of the magnet coil and on the section of the conductors. A copper wire, 0.4 inch in diameter and 8 inches long, making four or five turns around the magnetized bar, suffices to transmit the sound over a distance of several yards. The membrane of the transmitting instrument M. Maiche considers should be much larger than that of the receiver. The first should be from 3.2 to 4 inches in diameter; the

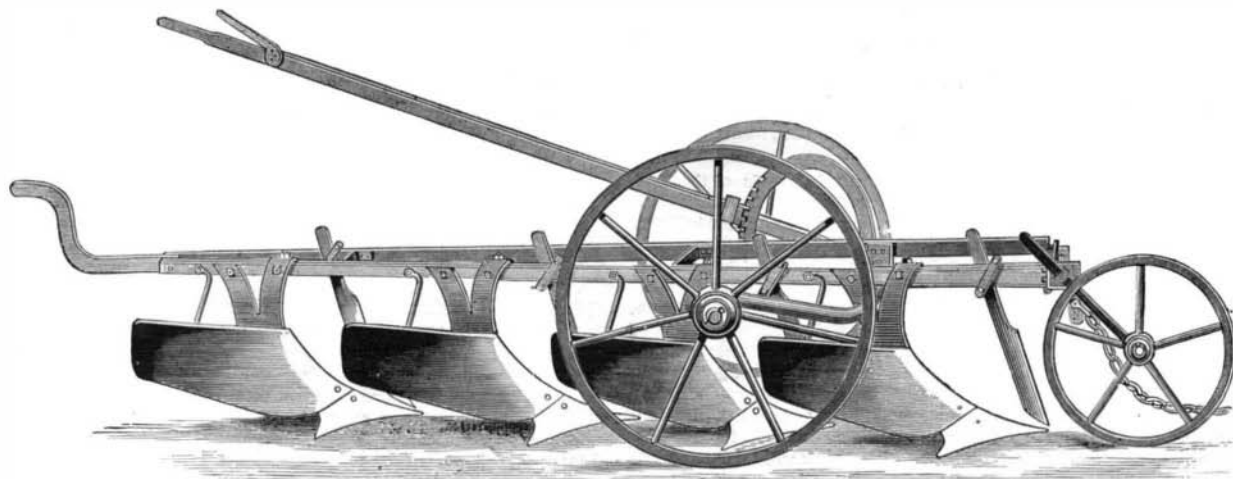
widely distributed species of the North, is very common in all of our woods, and, being an evergreen, may be collected at any season of the year. Most of the male fern for medicinal use has hitherto been imported, although the plant is found northward in the region of Lake Superior, and westward. Mr. Cressler's experiments were made with the oleoresin obtained from the rhizome of the fresh plant, and administered in gelatine capsules.

POISONOUS LEGUMINOUS PLANTS.

Leguminous plants, on account of the great abundance of albuminous material, in addition to starch, found in their seeds, have always been considered the equals of the most nutritious cereals—such as wheat, etc.—as articles of food.

Of such plants the common bean has probably been largest known and is most widely distributed. It was cultivated by the Jews, and considered as sacred by the Greeks and Romans. A temple to the God of Beans, *Kyanetes*, stood upon the sacred road to Eleusis; and the *Kyanepsia*, or bean feast, which the Athenians celebrated in honor of Apollo, was characterized by the use of these legumes. To the Egyptians the bean was an impure fruit, and they did not venture to touch it. The black speck on the white wings of the flowers was formerly looked upon as the written character of death; for which reason the bean in ancient times passed as the symbol of death. It has been reserved for modern times to learn that "death" may indeed "lurk in the pot" with at least some of these hitherto unsuspected pod-fruited plants. Attention has been called to the fact by Dr. Rothroch that certain leguminous plants growing in our Southwestern Territories possess poisonous properties. In the vicinity of Fort Garland, in Colorado, cattle have quite often given evidence of poisoning, which on investigation has been traced to the plant *Oxytropis lamberti*. The effects that follow the eating of this plant appear to be long enduring, the animal becoming demented and wasting away as its fondness increases to something like the opium habit in man. Dr.

Rothroch detected at New Camp Grant, Arizona, another plant, *Hosackia purshiana*, the effects of which are similar to the preceding. According to the *Academy*, Professor Cohn has recently reported a case of the poisoning of hundreds of sheep, at Namslau, from eating *Lupinus*. Two circumstances were spoken of as probable causes. Professor Cohn had, a year previously, demonstrated the existence in *Lupinus* of an active bitter principle, of which the poisonous properties, closely allied to the poisonous alkaloid of the water hemlock, are established. The other possible cause was found to be the occurrence, in most of the specimens submitted, of sclerotia, which burst out in the form of small black warts closely arranged in parallel series. Professor Cohn remarked that the question as to whether the poisoning should be attributed to the lupine or the fungus must be settled by chemical investigation. Subsequent experiments, however, in cultivating the fungus from the sclerotium have not as yet led to the production of any specific form that could have produced the poisoning. The lupines grow wild throughout the whole of Europe and in India and Arabia, and are mostly used as food for cattle, although the seeds are sometimes used by the poorer class of people. America has also its lupine (*Lupinus perennis*), and its bitter seeds are eaten from Canada to Florida. Another poisonous leguminous plant proves to be *Sophora speciosa*, from Texas. From the seeds of this Dr. H. C. Wood, Jr., has extracted an alkaloid which he calls *Sophoria*. The effects of this are stated to resemble those of the calabar bean. The seeds are



HOWARD'S GANG PLOW.

second reaches its maximum sensitiveness at diameters between 1.2 and 1.6 inch.

The Marginal Shield-Fern as a Tæniacide.

Mr. C. H. Cressler communicates to the current number of the *American Journal of Pharmacy* the result of some experiments made by him to test the efficacy of the marginal shield-fern (*Aspidium marginale*) in the expulsion of the tape-worm. He was led to make these trials through the failure, on a certain occasion, of an emulsion of the oleoresin of the imported male fern (*A. filix mas.*) to effect satisfactory results. As might have been expected from species so nearly allied, he found the constituents of the former to be identical with those of the male fern, and its efficiency to be fully equal. The marginal shield-fern is one of our most

used by the Indians of Texas to induce an intoxication which lasts from two to three days. Half a bean will, it is said, cause intoxication, and a whole one may be productive of dangerous symptoms. As to the alkaloid, Dr. Wood states that three grains of it hypodermically failed to very seriously affect a dog, but killed a cat in a short time.

The Coming Wheat Crop.

The harvest began in Missouri May 20, fully a month before the usual time. By the first of June the harvest season opened in Southern Illinois. The crop is magnificent throughout the entire country, and promises to be the largest ever gathered. The yield is estimated as high as 500,000,000 bushels. The movement of breadstuffs Eastward of late has been unprecedented.