

Improvement in Velocipede Wheels.

Lightness and strength are two essentials in velocipede construction, and many otherwise meritorious inventions have failed to become popular simply because one, or both, of these points were lost sight of in devising them. The improvement which we this week lay before our readers, is one directed especially to securing these vital points, and will become obvious with a very brief description. The rim, a portion of which is shown at the upper right hand corner of the engraving is corrugated as there plainly shown. The spokes are inserted into the rim alternately on opposite sides of the groove in the rim; those inserted into the left lateral portion of the rim connecting with the right end of the hub, and those entering the right lateral portion of the rim joining with the left end of the hub, thereby supporting the rim on both sides, and strengthening the wheel against lateral strains, at the same time admitting the easy attachment of rubber tire if desired. This form of the wheel gives very much greater strength and elasticity with a given weight of metal than could be attained by the old method.

The engraving shows an improved bicycle with the wheels constructed as described. The airiness and grace of the wheels are well delineated, thus illustrating the truth, that beauty of design is always connected with perfect fitness in mechanical construction.

In fact the bicycle from which this engraving was taken, is a marvel of perfect workmanship, and reflects great credit upon the manufacturer and inventor, Mr. Virgil Price, 144 Greene street, New York city, whom address for further information. Patented through the Scientific American Patent Agency, May 4, 1869.

THE INDICATOR.

No engineer conversant with the scientific principles of the steam engine denies that the indicator is of immense value. It is to be deplored that the use of this instrument cannot be more general. The comprehension of its principles is within the reach of almost any engineer in charge of stationary or other engines. Why is it that this instrument, so well calculated to add to the perfection of the steam engine, is, among those directly connected with the running of engines, so little known? It is not on account of the difficulty of understanding a card when taken, much less is it the difficulty of attaching the indicator to the engine that hinders its general introduction, but it is the price that is charged for an indicator. Few engineers can afford to pay one hundred dollars for an instrument, and the owners of steam engines are loth to pay the price for a thing, the utility of which they think is at the best but doubtful. The indicator very often is the means of showing the imminent peril at which the engine is working, and this is particularly true where two engines are connected together, for a derangement of one engine affects the other in the highest degree. If the demand for instruments was greater the present styles could be made much cheaper, but, on account of the high prices, the demand is so small that it does not pay to get up machinery for their special construction. The only way we see out of the dilemma is to design a style of instrument which will not be so costly in its construction, and, at the same time, will be ascertain and as accurate in its action. This no doubt presents many difficulties—some persons may say that they are insurmountable, but I scarcely think so, the thing is possible and will be accomplished by some enterprising person. The indicator in the hands of the great body of engineers will tend towards a better understanding of the action of the steam and will promote inquiries into the more difficult and complex principles of the steam engine, which will be as beneficial to the owners of the engines as to the engineers themselves. Coal would be saved, and many a break down could be avoided if the engineer in charge had a clear knowledge of those parts of his engine not immediately within his reach. ENGINEER.

PETROLEUM--IMPORTANT DISCOVERY.

M. Henri Sainte-Claire Deville has recently presented to the French Academy of Science the third portion of his valuable researches on the physical and heating properties of mineral oils. M. Deville, in this memoir, dwells largely on the dangers incident to the use and storage of petroleum, and on the modes of preventing the disasters which are of such frequent occurrence.

Most persons suppose all such cases to be due to one cause only; namely, to the highly inflammable nature of the volatile ingredients contained in these oils, which, by admixture with air, form explosive compounds. This is a cause of real danger, but the above-named chemist calls attention to a hitherto unnoticed reason for many fires and accidents.

This he attributes to the very great expansion in bulk which mineral oils undergo by increase of temperature. If petroleum has been barreled during the cold season, it will expand largely with the first appearance of hot weather, and will then burst the containing vessels, on the same principle that ice ruptures our water conduits and hydrants. The inflammable material then oozes out, often without being noticed, and is a lurking cause of danger. It is well known that the burning of petroleum refineries and storehouses gen-

erally takes place in hot weather after a cool period has just elapsed.

Now is the time of the year to look out for petroleum fires, and to see to their prevention. The conclusion to be derived from M. Deville's memoir is, that it is essential to leave sufficient space for expansion by heat in all vessels containing petroleum, and never to fill them to repletion.

When the paper of M. Deville shall have been published, we shall be able to tell our readers the exact extent of space needed for the mean expansion of all mineral oils.

This statement, taken in connection with the very recent

ed and described must be a boon, which to the science of hair-dressing is what the telescope is to astronomy.

This adjustable mirror is attached to the frame of any toilet glass, no matter what size or shape, by means of a flat plate screwed to the back side of the top of the frame, and having a shoulder which also rests on the top of the frame. This plate has a double adjustable joint from which extends forward a hollow rod, movable in any direction and held when adjusted by milled set-screws at the double joint. Within the hollow rod slides a bent rod to which a circular mirror is attached, which may be drawn out, or thrust in as occasion

may require, and fixed by a set-screw passing through the side of the hollow rod. The reflector may thus be lowered or elevated, turned to the right or left, and fixed in any position required. The reflector is also fixed to the rod by a movable joint and set screw, so that it can be placed at an any required inclination.

It is finished in superb style, being silver-plated throughout, and makes an elegant and ornamental addition to the toilet glass.

We are informed this article has met with a very favorable reception in Europe, and as its convenience and utility are obvious, its introduction in the United States will probably be an easy matter. The agent for the patentee, is Chas. J. Hartmann, room 46, No. 40, Broadway, New York city, whom address for further information.

How Bronze Statues are Cast.

Among the various branches of fine-art metal work, the casting of bronze statuary, a *chef-d'œuvre* of Elkington's establishment, possesses perhaps as many points of interest as any. A leading process of bronze casting is known, says the *Engineer*, as the *cire perdue*, or wax process. A structure of iron bars, forming the skeleton of the statue, sustains the core. This rough angular outline stands on a kind of platform, having a fire-hole beneath for the purpose of melting the wax when the statue is completed. A mixture of clay, pounded brick, and other material, capable of being easily worked when moist, and very solid when dry, is then used for building up the skeleton, so as to present the general contour of the figure, but less than the proposed statue by just the thickness of the metal to be employed. Over all this is placed an

equal layer of wax, on which all the details are expressed by the sculptor. "When," says Mr. Aitkin, our informant, "the work is satisfactory from every point of view, ascending rods of wax representing channels, by which air is to find exit on the metal entering the molds, are placed wherever required. Viewed in this state, the model and its accompaniments strongly suggest the venous and arterial system of the human body, as shown in anatomical works, with the difference that the wax rods are external to the model of the body, which is visible through the intervening mesh-work. The whole model and rods are then painted over with fine loam in a liquid state, the process being repeated until the crust is strong enough to sustain a thick loam plaster. It is then bound with iron hoops, and a fire is lighted beneath the platform. The outer coating of wax, exactly representing the metal to be cast, is melted out, and the mold is intensely heated until dry enough to receive the molten metal from a reverberatory furnace adjacent to the mold. Jets are made for the introduction of the metal, and the apertures left by the melting of the wax rods afford a ready mode of exit for the air. The plug of the furnace is withdrawn, the flowing metal fills the mold, and the statue is completed. This process is somewhat hazardous, seeing that any defect in the casting would completely destroy the long labor of the artist." —*Mechanics Magazine*.

Telegraph Verdict.

The case of Henry L. Davis against the Western Union Telegraph Company, which has recently been on trial at Cincinnati, Ohio, resulted in a verdict for three thousand dollars damages, with costs, amounting to over two thousand dollars more, against the company.

This was a very important suit, involving the question of the right of telegraph companies to discriminate in the transmission of dispatches. The plaintiff's telegraphic reports were delayed in order to give the company's reports precedence.

The legal principle on which this decision is founded is, that a telegraph company is a public servant, bound to transact all business confided to it fairly and impartially, and that it has no right to afford exceptional facilities, even for the transmission of its own business, when such business comes into competition with that of the public. The fairness and justice of this principle must be admitted by every unprejudiced person, and we hope that it will be vigorously maintained by courts and legislatures, until the time shall come when a person desiring to make use of telegraphic facilities shall have assurance of fair treatment under any and all circumstances.—*Telegrapher*.

A FIRM in Oshkosh, Wisconsin, has contracted to make 1,000,000 feet of wooden tubes, to lay down in that city for gas pipes. They are made of timber six inches square, bored in the same way as pump barrels.



PRICE'S IMPROVED BICYCLE.

and destructive oil-fires at Hunter's Point, L. I., and at Weehawken, N. J., occurring under the precise conditions of temperature described by Mr. Deville, will attract much attention.

THE ADJUSTABLE LOOKING-GLASS REFLECTOR.

How the amount of labor involved in the complicated structures which ladies now wear at the backs of their heads can be accomplished by a pair of hands without eyes, has always been to us an inscrutable mystery. Our own back hair



with its simple parting is a matter of some anxiety, only relieved by consultation with some one of our household, previous to our emergence into the street of a morning; and when the answer is satisfactory there always remains a gloomy doubt on our mind, as to whether the inspection was carefully made and the answer based upon the real state of things. We have been assured the amount of experiment which enables a lady to adjust her hair unaided is something very remarkable; and that it has hitherto been guided only by the sense of feeling, the result of each experiment being determined by aid of a handmirror. If this be really so, the article herewith illustra-