LOOSE PULLEY LUBRICATOR.

The accompanying engravings—Fig. 1 is a perspective view and Fig. 2 a longitudinal sectional elevation—show a loose pulley oiler, in which the flow of the oil is automatically controlled by the speed of the pulley, and which is remarkably simple in construction and reliable in operation.

By unscrewing the lid or cover, C, the reservoir, B, can be filled with oil. Within the reservoir is a piston, E, which is normally kept at the inner end of the cylinder by the tension of the spiral spring. D. During the revolution of the pulley the piston, thrown out by centrifugal force, exerts a pressure upon the oil corresponding to the velocity of the pulley, and forces it through the feed pipe, F, to the nozzle on the

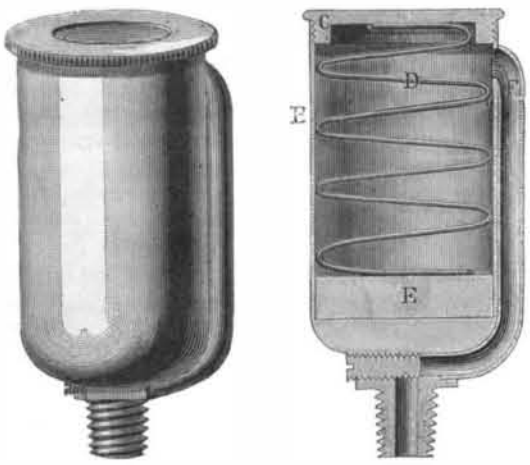

Fig. 1. Fig. 2.

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shaft. The supply is regulated by means of a screw, which may be set so that the reservoir will be emptied in a few minutes, or so that the amount will last for weeks; when the proper aperture for the screw has been ascertained by experiment, the oiling of the pulley requires no further attention. When the pulley stops, the flow of oil also stops; and the spring, carrying the piston back, draws all the oil out of the feed pipe into the reservoir, thereby preventing the wasting or spilling of oil—a fact which, it will be readily understood, brings, besides the advantage of economy, that of absence of soiling of fabrics, of soaking of belts with oil, and other inconveniences incident to the old methods of lubrication.

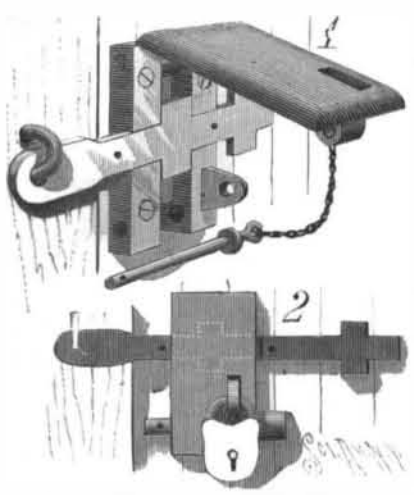
These lubricators, made by the Loose Pulley Lubricator Manufacturing Company, of Middletown, Conn., are adapted to pulleys from six inches in diameter and upward, and are screwed into the pulley hub by tapping out the oil hole, an operation easily performed without removing it from the shaft.

Endurance of Woods.

In some tests made with small squares of various woods buried one inch in the ground, the following results, says *The Garden*, were noted: Birch and aspen decayed in three years; willow and horse chestnut, in four years; maple and red beech, in five years; elm, ash, hornbeam, and Lombardy poplar, in seven years; oak, Scotch fir, Weymouth pine, and silver fir decayed to a depth of half an inch in seven years; larch, juniper, and arbor-vitæ were uninjured at the expiration of the seven years.

FASTENING FOR FREIGHT CAR DOORS.

The base or stationary part of the fastening, shown open in Fig. 1 and locked in Fig. 2, has corner holes to receive bolts by which it may be attached to the car body. One of the bolts is made with an eye head to pass through a slot in the cover and receive a padlock, when desired. The cover is made with an eye upon the inside of one end to enter a recess in the base, and receive a pin by which the two parts are hinged together. Upon the inside of the other end of the cover is an eye to enter a recess in the end of the base, and receive a pin passed through a transverse hole in the base. The pin is made with a head on one end and a hole through the other end to receive the wire of the seal, which is also passed through a hole in the hasp, which is hinged to the door by a staple and formed with two cross heads as shown in the engraving. In the base of the fastening is a transverse groove for the body of the hasp and a longitudinal groove for a cross head. The hasp is secured in place in the grooves by the cover. With this construction the door can be fastened fully or partly closed, and when fastened and sealed cannot be opened without breaking the seal.



This invention has been patented by Mr. G. A. Germond, whose address is Station R, New York city.

Good Inventors.—Poor Lawyers.

One of our English exchanges says of English inventors that they are usually clever and necessarily of ingenious turn of mind, but concludes that they as a class should make poor lawyers. The writer cites a case which has heretofore appeared to be interminable, and had assumed something of the proportions of a *cause celebre* in the annals of patent litigation. It was the old story of alleged infringement of a patent right, and the appeal against the decision of the inferior courts was dismissed in the superior court in favor of the respondent, not because there was or was not infringement of the patent right, but because the appellant had in his specification insufficiently described the character and defined the limits of his invention. There was apparently some ground for the belief that the appellant had room for complaint against the respondent, inasmuch as the Bench remarked that it was a matter for regret to have to come to the decision which, as a matter of law, had to be come to, as the invention in question was a valuable and clever one.

Here, then, valuable patent rights have been practically a loss to the original inventor because of his having failed to observe sufficient care in the wording and preparation of his specification. It is impossible to say how many valuable inventions have been lost to their inventors from a similar cause. It is not sufficient, in order to secure the fruits of a valuable invention, to merely patent it. The degree of protection afforded by a patent depends, to a great extent, upon the proper wording of the specification, which should carefully define the nature and scope, if not the limits, of the invention. It should omit nothing that it is of present or prospective utility to state. The less ambiguous it is, the fewer are the chances and possibilities of infringement and ultimate pecuniary loss.

Steel against Iron.

Mr. William F. Zimmermann, of the Pittsburg Testing Laboratory, has completed for the Detroit Dry Dock Company a test of the new steel plates which will enter into the construction of the new steamer they are building for the Detroit and Cleveland Steam Navigation Company. The average tensile strength of the plates is stated to be 60,000 pounds to the square inch. This soft steel is said to be of such remarkable elasticity that a piece of plate may be stretched one-half longer than its usual size without parting. The Detroit Dry Dock Company recently made some experiments of its own with the soft steel used in the construction of the new steamer Mascotte at its yards in Wyandotte. They were made both with soft steel and the best quality of iron used in the construction of iron ships. Strips of cold steel plate $\frac{5}{16}$ inch thick and $\frac{3}{4}$ inch wide were twisted like an auger in a lathe, and even doubled, without cracking or causing a single abrasion of the metal's surface. Angle irons were flattened cold and bent in like manner. Another strip was bent repeatedly without causing it to break or even flaw. In the presence of the owners of the Mascotte, a large ball weighing 950 pounds was suspended at a height of 35 feet, and allowed to drop on a $\frac{5}{16}$ inch plate, bulging it about 20 inches into the ground without breaking it. The ball was then dropped on the reverse side of the plate, and this repeated five times without breaking the plate. The same test was made with a ½ inch iron plate, and it was broken the first time. These tests are regarded as furnishing a conclusive demonstration of the comparative merits of soft steel and iron for resisting sudden shocks, and consequently of their respective merits as materials for the construction of modern ships.

Decomposition of Cast Iron by Heat.

From some experiments which M. L. Forquignon made upon malleable iron, he was led to suppose that cast iron, at a temperature somewhat inferior to its melting point, is decomposed into free graphite and a purer carburet of iron. He accordingly heated cast iron in a vacuum to a temperature of from 900° to 1,000° C., for several days, without melting or softening. The metal became malleable, and its surface was covered with a dull grayish efflorescence, which produced a mark upon paper or on rough porcelain. The fracture was sometimes of a uniform black, like that of a lead pencil, and sometimes it was dotted with black grains of amorphous graphite, regularly disseminated throughout the mass. It seems probable, according to the *Comptes Rendus*, that this partial decomposition depends upon a tendency to equilibrium between the carbon, the iron, and the carburet of iron, the relative proportion of each of these bodies being a function of the temperature. The decomposition of a homogeneous solid into two other solid bodies is a very rare, if not unique, phenomenon.

THE SMALLEST FIRING REVOLVER.

The very diminutive firearm illustrated in our engraving is the workmanship of Mr. Victor Bovy. It is shown in actual size; and of working revolvers, it is undoubtedly the smallest in the world. The dimensions are truly Liliputian; the total length, from handle to muzzle, is 1½ inches, and the weight is something under half an ounce. The cartridges shown are also natural size, though only about a quarter of an inch in length, and the weight of shell, charge, and bullet is only a trifle over a grain. The charge consists entirely of fulminate, as the dimensions are too small to permit the use of powder. It is in all respects a perfect little instrument, and quite as complete as larger revolvers. There are six cartridge chambers, a self-cocking device, and a minute rod for discharging the empty shells. In spite of its pygmy proportions, its execution is quite comparable with larger arms. At a distance of ten inches it gave a penetration in wood of three-sixteenths of an inch, while at four and a half feet the bullet passed through a pane of ordinary glass. The

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accuracy of aim is naturally limited by the short barrel and nearness of the sights to each other, though at four and a half feet the bullet passed within two and three-eighths of an inch of the bull's eye. The revolver has the appearance of a toy, but it is nevertheless a veritable weapon, and if directed toward a vital part would be quite capable of producing a serious wound.

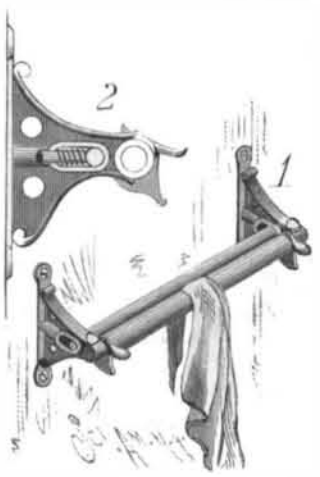
Fast Railway Time.

A train carrying the president and directors of the Delaware, Lackawanna & Western Co. recently made the trip over the Morris & Essex Division, from Hoboken to Washington, N. J., 67 miles, in 1 hour 24 minutes, being at the rate of 47·9 miles per hour for the entire distance, including two stops for drawbridges and slow running required at other points. The fastest time made was on the 4·6 miles between Port Morris and Waterloo, which was run in 4 minutes, or at the rate of 69 miles per hour. The 20 miles from Port Morris to Washington was run in 19 minutes, or at the rate of 63·2 miles per hour. The train consisted of 3 cars, and was drawn by engine No. 134, which has 18 x 24 in. cylinders and 5 ft. 6 in. driving wheels.

The fast train on the West Shore road on June 4 last made the run from Newark, N. Y., to East Buffalo (94 miles) in 119 minutes. Of this time 13 minutes is deducted for stops, leaving the actual running time 106 minutes, being at the rate of 53·2 miles per hour. The actual running time from Frankfort to East Buffalo (202 miles) with 6 cars was 254 minutes. On June 17 the same train with 7 cars ran from Newark to East Buffalo in 105 minutes, and from Frankfort to East Buffalo in 247 minutes, or at the rate of 49·1 miles per hour.

TOWEL RACK.

The simple and convenient towel rack shown in the engraving has been patented by Mr. Joseph Bergsten, of Rockford, Ill. Each bracket has a bearing in which the reduced ends of the outer towel holding roller are journaled; on each end of the roller is a cam plate having a finger piece by which it may be turned. The ends of the clamping roller are supported in slots and are pressed outward by springs as shown in Fig. 2. The rear roller being forced back by turning one or both of the cams, the towel may be placed between the rollers, where it will be firmly held, after the cams have been moved back, by the springs forcing the rear roller outward. Should it be desired to hang a towel in the rack, one or more towels being already in, a cam at one end only need be turned to separate the rollers, to allow the extra towel to be placed between them. To remove the towel it only necessary to pull them from between the rollers, which turn as the towels are drawn out.



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