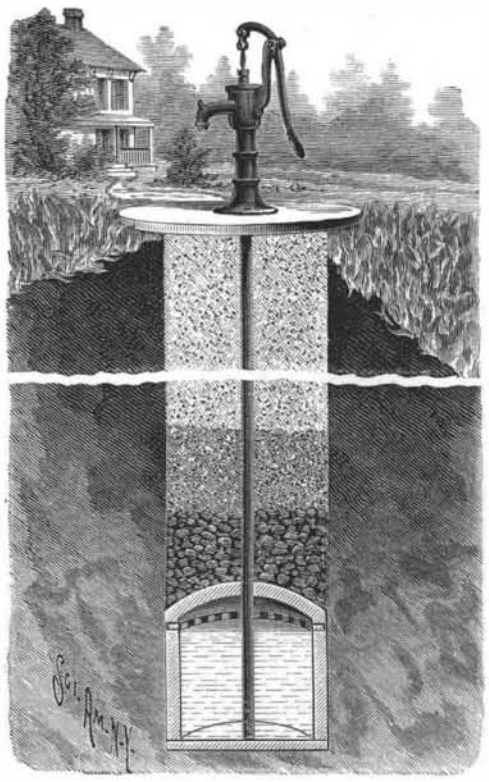
NEW TUBULAR WELL.

Where driven wells are feasible, they have become very popular, because surface drainage into the well is avoided and the entrance of foreign matters into the water chamber is prevented by a thick stratum of earth, but driven wells are objectionable insome places



RICE'S TUBULAR WELL.

on account of the liability of the strainers, the valves, and even the pipe to stoppage by gravel and sand.

To avoid these difficulties Mr. John Owen Rice, of Hutchinson, Minn., has invented and patented a device by which the advantages of the driven well may be secured, while its disadvantages are claimed to be avoided. As will be seen by reference to the engraving, the improved well, which is of considerable diameter, is dug down to the water-bearing stratum, and at this point is built a reservoir of brick, cement or wood, provided with perforations for the entrance of water, and arched over the top. At some point in the arched top of the reservoir, preferably at the center, is inserted a tube which extends from the bottom of the reservoir to the pump above. The lower end of the pipe is perforated to allow water to enter, and the space above the arched top of the reservoir is filled with stone, gravel, and earth, preferably arranged in the following order, stone being placed upon the arch, gravel upon the stone, and earth above the gravel.

With the well constructed in this manner, the water in the reservoir is perfectly protected against contamination from surface drainage or from the entrance of foreign substances, and at the same time gravel, sand, and earth are prevented from entering the pump chamber.

THEATRICAL ILLUSIONS.

An explanation of the illusions employed in theaters is always welcome, and the spectators take more interest in seeing a mystery performed whose hidden working is familiar to them than do those who do not possess the key of the enigma.

We are going to describe two tricks which, though now old, have had much success. The first of these, called the palanquin or stretcher, was employed in an old fairy scene whose name escapes us. It was almost as much of an illusion as is obtained in prestidigitation, and the rapidity with which it was performed did not allow the secret of it to be perceived.

One of the heroines of the play was presented on the stage in a palanquin carried by four slaves (Fig. 1). At a given moment the curtains were drawn and then immediately opened, when it was seen that the actress had disappeared; and yet the palanquin was well isolated on the shoulders of the carriers, who resumed their journey and carried it off the stage.

This trick, which preceded by many years Bualtier de Kolta's experiment, in which also a woman was made to disappear, but by an entirely different process, was performed as follows:

The four uprights arranged at the four corners of the apparatus were hollow, and each contained at the top a pulley over which a cord passed. These cords were attached by one end to the double bottom of the palanquin, and by the other end to a counterpoise concealed in the canopy.

At the precise moment at which the curtains were drawn, the carriers disengaged the counterpoises, which, sliding within the uprights, rapidly raised the double bottom, with the actress, up to the interior of the canopy. The person thus made to disappear was quite slender and took a position such as to occupy as little space as possible. By making the shadows of the mouldings of the canopy and columns more pronounced through painting, and by exaggerating them, the affair was given an appearance of lightness that perplexed the most distrustful spectator.

This illusion appeared extraordinary, and has hardly been surpassed except by the disappearances effected by prestidigitators. The second trick that we shall describe is employed in the *Peau d'Ane*, for producing the fairy robes of the story—color of the sun, color of the moon, and color of the sky—required by the play. In the midst of a brilliantly illuminated procession come two porters carrying quite a large chest by its handles. Having reached the royal throne, they place the chest on the floor and raise its cover, when there is immediately seen a fabric of the color of the sun, that is to say, of a luminous golden yellow, that overpowers the dazzling luster of the cortege. Afterward, two other porters come with a similar chest, which, when opened, exhibits a fabric as if phosphorescent, of a slightly bluish white. The third chest contains the sky-colored robe, that is to say, of a celestial blue, luminous like the two preceding colors. These wonderful fabrics are moved about by the porters, who make them sparkle.

The bottom, B, of each of these chests is capable of being opened over a trap, A, and, by means of an electric light device, C, a powerful ray is directed upon the light and transparent fabric, which seems to be on fire.

The yellow light suffuses the fabric of the same color, envelops it, and incorporates itself with it. After the cover has been shut down upon the stage, the bottom is closed from beneath, the trap is shut, the light is extinguished, and the chest is carried away by the porters.

The same is done with a slightly bluish white fabric, and a white light for the moon-colored fabric; and then with sky-colored tarlatan and a light with a bluish tinge for the sky-colored fabric. These effects, if not the most astonishing, are at least among the most dazzling of any of those that have been employed in the theater.—*La Nature.*

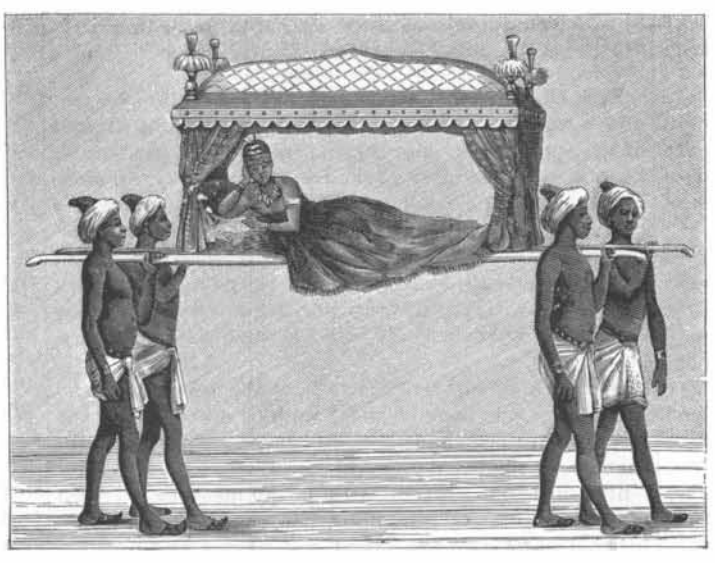


Fig. 1.—THE MAGIC PALANQUIN.

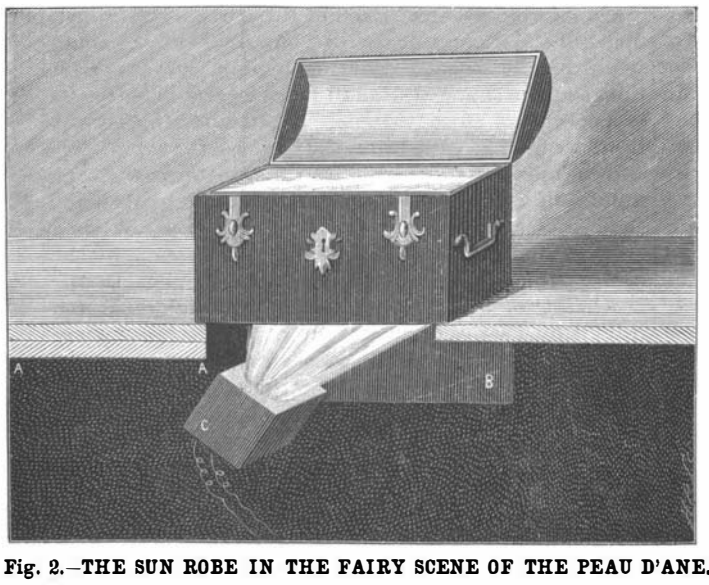
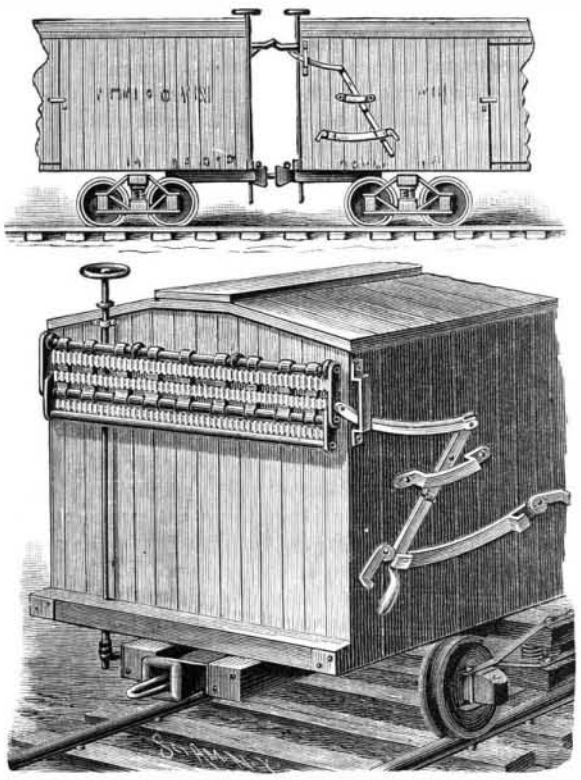


Fig. 2.—THE SUN ROBE IN THE FAIRY SCENE OF THE PEAU D'ANE.

A NOVEL method of strengthening iron castings has been brought out by Mr A. Jepson, of Manchester, England. The process consists simply in casting the metal around a wrought iron core. Thus, for thin plates, like stove plates, a thin wrought iron perforated plate is placed in the center of the mould, and the metal is poured around it. Wire (either straight or in coils), rods, bars, sheets or any form of iron, may be used according to the shape of the casting. It is stated that the close union of the cast iron with the wrought is assured by plating the wrought core with a thin coat of tin.

PLATFORM FOR FREIGHT CARS.

An inquiry into the cause of accidents which happen to trainmen on freight cars reveals the fact that the great majority of such accidents are caused by the trainman losing his footing in passing from one car to another, causing him to fall between the cars. This is sometimes owing to irregularity in the running of a



TYRRELL'S PLATFORM FOR FREIGHT CARS.

train, and at other times to inadvertence on the part of the man.

The frequency of these accidents has led Mr. Thomas C. Tyrrell, of Glendive, Montana, to devise a platform for the ends of freight cars, which will not only prevent such accidents, but will also facilitate the work of the trainman in operating the brakes.

A single car having this improvement applied is shown in perspective in the lower view, and the adjoining ends of two freight cars are represented in the upper view, showing the platform in the position of use. The platform consists of two parts hinged together, one of the parts being connected with the end of the freight car, so that it may be raised up into a horizontal position for use, or dropped down parallel with the end of the car when out of use, as shown in the lower figure of the engraving. The main portion of the platform is formed of three rods secured to end pieces, and cross bars connecting the said rods and supporting strips of corrugated iron which afford a suitable footing for the trainmen. The upper rod of the three is pivoted in eyebolts screwed into the timbers in the end of the car. Upon the lower or outer rod is pivoted the second part of the platform, which is free to turn upwardly, but its end pieces are shouldered so that it cannot turn in the opposite direction. This construction is designed to prevent injury to the platforms when the cars are forced toward each other, as in the case of coupling, or retarding or stopping the train by reversing the locomotive.

To the side of the car is pivoted a lever, which is connected with one of the end bars of the platform by a curved connecting rod formed in two sections, the shorter section being pivoted to the longer section, to allow the platform to turn upwardly when the space between the ends of the cars is very small. The lever which operates the platform is made in two parts hinged together, the lower end being arranged to swing outward laterally to permit of passing it over clips at the ends of a curved bar secured to the side of the car, and designed to hold the lever in either of the two positions in which it may be placed. The extremities of the curved bar are provided with eccentrics, either of which may be closed down upon the side of the lever to hold it in place in the clip.

This invention, which is covered by a patent, is well calculated to lessen the danger and discomfort of trainmen, and to facilitate the operation of the brakes.

When the car is not in use, the platform is folded down closely against the end of the car, as shown in the larger view of the engraving.

MAYER has calculated that, if the motion of the earth were suddenly arrested, the temperature produced would be sufficient to melt and even volatilize it; while, if it fell into the sun, as much heat would be produced as results from the combustion of 5,000 spheres of carbon the size of our globe.

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