

SIMPLE SLIDE CHANGER AND ECLIPSE.

BY GEO. M. HOPKINS.

With perhaps the single exception of the photographic camera, there is probably no instrument of which so many different grades can be found as of optical lanterns, ranging as they do from the poor toy article with a candle for a light, up to the magnificent optical lantern employing electricity as an illuminant and costing hundreds and in some cases thousands of dollars.

The apparatus here described is not designed for use with either of these extremes, but is intended for a good single lantern used for projecting photographic shades.

One does not need to be an adept in lantern matters to know that half the effect is lost when the slides are passed through the field in successional order; and while the superb effect secured by two or more lanterns and dissolving apparatus cannot be produced by a single lantern, slides can be changed, without making the movements visible on the screen, by means of an eclipser, which will momentarily shut off the light while the slide is being moved.

Several varieties of apparatus for this purpose have been devised, most of them being complicated and expensive.

The engravings show a simple device which is effectual in accomplishing the desired result, and if entirely home-made the cost is very small indeed.

The principal part of the device consists of a wooden slide changer which may be purchased for a small sum from any dealer in optical lanterns, or it may be readily made by any one who is handy with tools.

The frame forming the fixed part is of the right size exteriorly to fit into the lantern. The opening through the frame is the same as that of a lantern slide mat. To this frame is fitted a slide having two pockets, one at either end, for receiving slides; the openings in the slide are larger than those of the fixed frame. In the bottom of each pocket is pivoted a brass lever, and in the outer end of each pocket is a space containing a vertical wooden rod, the lower end of which rests upon the shorter arm of the lever while the upper end projects above the slide and forms a stop for limiting the motion of the slide. The pressure of the finger on the top of the wooden rod, as shown in Fig. 2, starts the slide from the pocket, so that it may readily be removed and replaced by another. Both pockets are seen in Fig. 1, which shows the operation of changing.

To the lower part of the front of the fixed frame is hinged a shutter made of vulcanized fiber, and through the shutter, about one-half inch above its lower edge near opposite ends, are made holes, and in the fixed frame opposite these holes are bored oblique holes for receiving the shutter-operating cord, which passes along the outer surface of the slide, through the holes in the frame and shutter and along the outer surface of the shutter between the holes. The ends of the cord pass through holes in the wooden strips secured to the sides of the slide at its ends, and each end of the cord is provided with a shoe button for a handle.

To the fixed frame, near one of the hinges of the shutter, is secured a thick piece of felt, which serves the double purpose of preventing the shutter from closing against the frame, so as to allow it to readily fall open when released, and of preventing noise.

In Fig. 2 a picture is being exhibited through the opening of the fixed frame, while slides are being changed in the other part of the apparatus. By drawing on the button at the right hand end of the slide the first operation is the closing of the shutter, the second is the shifting of the view while the shutter is closed, the third operation is the falling of the shutter on the release of the cord, and the exposure of the second view.

The cord used is the finest and strongest silk fish

line, and, to insure smooth action, the cord is coated with black lead.

To insure sufficient friction of the slide to prevent it from being moved until after the shutter is closed, a small steel spring is inserted between one of the upright bars of the fixed frame and the slide, as shown in Fig. 3.

ENGLISH RAILWAY EXHIBIT FOR CHICAGO.

Our illustration, from a photograph, represents one of the largest locomotives ever built in England, on its way to a place in the World's Exposition at Chicago.

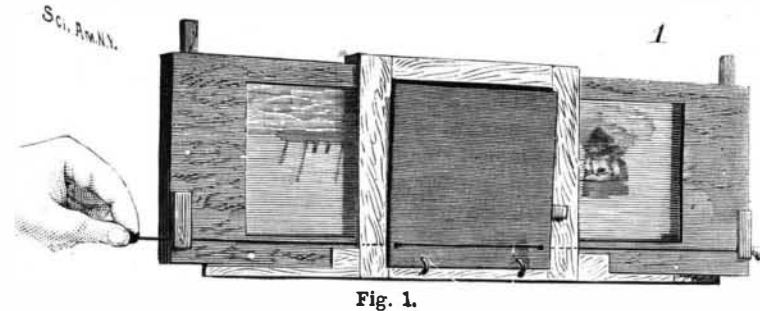


Fig. 1.

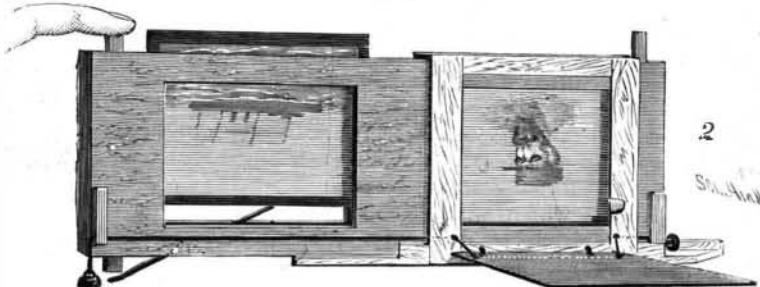


Fig. 2.

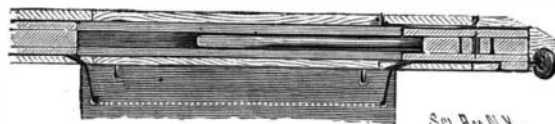


Fig. 3.

SIMPLE SLIDE CHANGER AND ECLIPSE.

The engine constitutes a portion of the exhibit forwarded by the London and Northwestern Railway, and was hoisted from the ship which brought her across the ocean to one of the huge lighters so much used in New York harbor for transporting railway cars. The exhibit was forwarded to Chicago by the New York Central Railway, and consisted, besides the engine, of two passenger coaches and a number of smaller models and railway appliances.

The locomotive is named the Queen-Empress, is 32 feet long and weighs 47 tons, the tender being 15 feet

the cars is a day coach and the other a sleeper. They are called saloon vestibule cars, and are entered from the sides instead of the ends. The interior of the sleeper is fitted up with compartments to contain fourteen people each. In each compartment is a toilet room. There is also a smoking room and compartment for the attendant. Both cars are painted a chocolate color up to the windows. Above that the color is white. The interior of the sleeper is fitted up in satin and walnut woods, and the upholstery is in dark plush. The car is heated by a gas stove and provided with gas and electric lights. The day coach is a composite car, arranged to accommodate first, second and third class passengers.

Along with the train are several other exhibits of the English company, the most important being an exact reproduction of the old locomotive Rocket, the first successful engine built by George Stephenson, and first operated on the Liverpool and Manchester Railroad in 1829. There is also a model of the mogul type, called the Dreadnaught, which is the first compound engine to be operated in England. The entire exhibit of the London and Northwestern Railroad cost \$50,000, and will occupy 2,800 square feet of space.

Magnetized Chain. Wheels for Towing.

An interesting application of electro-magnetism has recently been made in France in the industry of chain towing, which is extensively carried on on some of the large European rivers. The several turns of the chain on the towing drum necessary to get the proper adhesion has been the chief cause of deterioration and rupture, and this fact, together with the difficulty of properly paying out the chain, in rounding bends, especially where it is used in ascending the stream only, has directed attention to improvement in these matters. The experiments conducted by the Société de Touage de la Basse Seine et de l'Oise upon the River Seine have culminated in the construction of a large tow boat, whose towing apparatus contains several magnetized pulleys.

The main towing pulley is but a little over 4 feet in diameter. It is simply a solenoid, whose soft iron coil is flanged to form the groove, the bottom of which is a bronze ring with rubber joints to prevent the wire coil from getting wet. The current is generated by a small dynamo. The whole construction is simple and very strong, and besides the advantage of having a small towing pulley there is the much greater one that the proper amount of adhesion is obtained

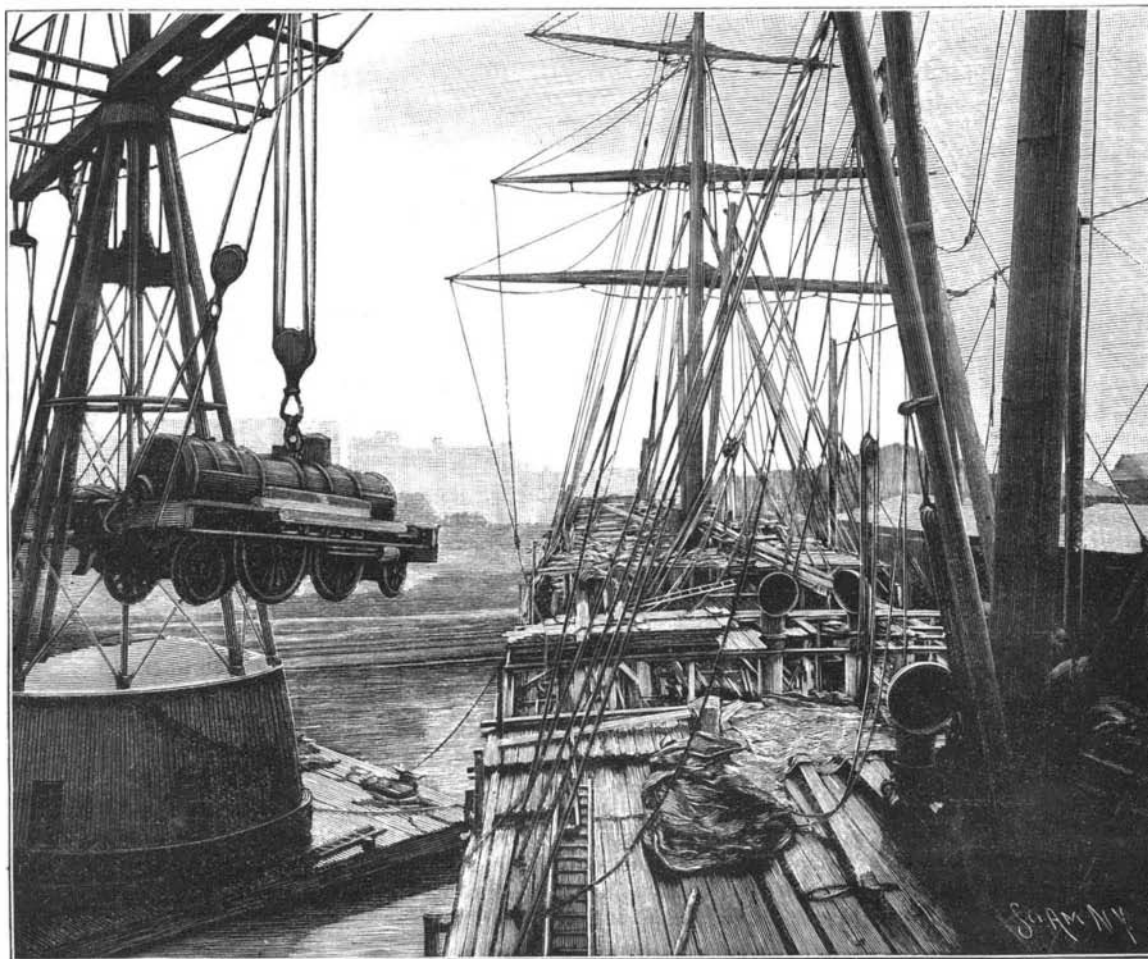
with only three-quarters of a turn. A similar magnetized pulley acts as a brake on the slack of the chain, enabling it to be properly and regularly paid out. It is hoped that these improvements will render chain towing practicable on rivers when the rapidity of the current or the crookedness of the stream has hitherto prevented its adoption.

Paint for Racers.

When the Galatea was over here, she was hauled out for the purpose of having her plates smoothed down and coated for the international races. This occupied three days, for first of all she was sand-papered all over, and every crack and flaw in the cement was filled up. Then over the paint were put two coatings of gold size, and in the last coat black lead or pot lead was mixed. When all had set hard the surface was polished with brushes. The result, of course, is perfection so long as it keeps clean, but weeds grow very quickly upon it. In point of fact, Galatea began to foul within a fortnight. It is said a good

plan is to mix the black lead in a bucket with the white of eggs, beating the latter well up beforehand.

GUNTER's chain, used in measuring land, was invented by Edmund Gunter in 1606.



UNLOADING A LARGE ENGLISH LOCOMOTIVE AT NEW YORK.

long and weighing 13 tons. There are four driving wheels, each 7 feet 6 inches in diameter, and she is said to make over 90 miles an hour.

The passenger coaches are built according to the latest English patterns, and will be quite novel as compared to American vehicles of like character. One of