

THE ILLUSION OF TRILBY.

Hermann has now won for himself a firm place in the regards of the civilized world, he representing the *fin de siècle* Houdin. His carefully executed work, with its perfect detail and finish, is a standard among performances of natural magic, and other exhibitions are referred to it as the gage of their quality. We have described in our columns a number of illusions as shown on the boards of the theaters and music halls, many of which exhibitions by their ingenuity have seemed worthy of illustration. The present article is devoted

Wonders of Venetian Glass.

Among the lagoons, nearly due north of Venice, in the island of Murano, there live a race of men who seem to have a great future, says the London Globe. They are the descendants of the old Venetian glassworkers, and of late years they have been reviving the ancient art, which made Murano famous in the past, of glassblowing. The old Venetian glass was what is commonly called blown, but the name gives a very small idea of the manufacture. Glass has certain characteristics which give its true beauty and value for art pur-

mulated on its end. If too much or too little is taken, the wine glass will not be of the right size, and if the metal, as it is called, is not of the right temperature, the color will be too dark or too light. The lump is rolled on a table into symmetry and heated again. A few turns of the rod and a breath or two through it, and a hollow ball appears at the end. One extra puff of the breath, and the bowl would be too large and too thin. A boy brings up a small portion of white glass, which he has picked out of another reservoir, and blown hollow. This must be so hot as almost to drop off the rod, and must



PREPARING TRILBY'S COUCH.



THE AERIAL SUSPENSION OF TRILBY.

to Hermann's illusion "Trilby," in which hypnotism is supposed to play a part. As will be seen, it is really an ingenious application of mechanics.

A plank is placed upon the backs of two chairs. A lady performer who is supposed to represent Du Maurier's "Trilby" enters and, stepping on a footstool, lies down upon the plank. She holds a bouquet in her hand, which bouquet, unknown to the audience, has its own part to play. The other performer, Hermann, who is supposed to be Svengali, carefully arranges the drapery, walking around her as he does so. Then he makes some passes, and one by one removes the chairs, and the lady and board remain in the air. In response to his passes the lady, still resting on the board, rises, and the position changes to an inclined one and back to the horizontal one. Finally the chairs are replaced, the lady by passes is supposed to be waked from her trance and steps down, chairs and plank are removed, and nothing is to be seen further.

Two of the cuts show the progress of the performance as seen by the audience. The third cut explains the mechanism. Behind the scene is a strong frame, up and down which a movable slide works. Tackle is provided to raise and lower the side; and a workman behind the scenes is intrusted with its manipulation. A bar carrying at its rear end handles, and in front a socket, shown in the upper right-hand corner of the same cut, is journaled in the slide, and can also be thrust in and out through the journal box.

When Trilby has been placed upon her board couch, the bar is thrust forward, drapery at the back having hitherto concealed its socket end. The fair Trilby with her bouquet now effectually conceals it as it emerges from behind the curtains. The performer, while apparently sedulously arranging the drapery, guides the socket and causes it to grip the board. The assistant behind the scene pulls upon the tackle and works the handle, so that Trilby's weight leaves the chairs one by one, which are removed, and, supported by the bar, she seems to float in air. By manipulating the tackle she can be raised and lowered. By the handles she can be tilted about, giving a wonderfully good effect. Finally the chairs are replaced, and the assistant lowers Trilby upon them. During the waking passes the socket is detached and the bar is withdrawn. A close observer may notice a slight agitation of the drapery or curtains behind the stage as the bar is pushed out and withdrawn, but the attention of the audience in general is so taken up with the performance proper that this disturbance is overlooked by them.

The magician, it will be seen, can only walk completely around the reclining lady before the bar is in place or after it is withdrawn. When the bar is in place, he can walk behind her, but cannot go completely around her. Hence his complete excursions are restricted to the time when she is resting on the chairs, before the bar is in place or after it has been withdrawn.

After the board is vacated, Svengali throws it down upon the stage, its fall, with accompanying noise and disturbance, showing that there is no deception about that portion of the display.

THE engraving of the lord mayor's coach, which appeared in our last issue, should have been accredited to The Hub, one of the best papers devoted to carriage building published at home or abroad.

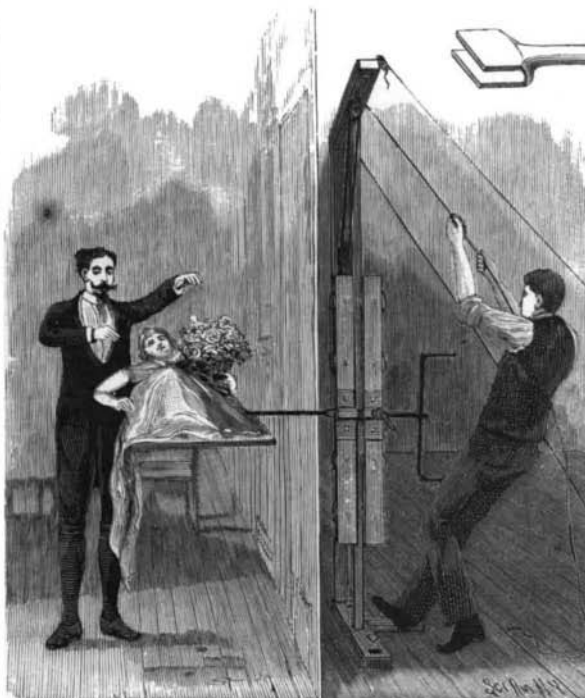
poses, and though you may neglect these and force it to take forms utterly foreign to its nature, you are producing not works of art, but monstrosities. Whatever glass may be, it is in its natural state not crystalline, so that nature is outraged when we grind it into sharp angular forms that belong rather to other materials. The old Venetian glass was light, bright, vitreous in appearance, and stained with the richest possible colors, and all these qualities are retained in the newly revived manufacture at Murano. There is one more strong point in favor of glass blown and worked over that moulded—namely, that every individual piece is an original work of human art, and as it is almost impossible that any two should be exactly alike, unless their form is very simple indeed, the buyer chooses according to his fancy, and is sure that no one else possesses a piece of exactly the same size and shape. In the manufacture of the ordinary cut glass, minium (red lead) is frequently added to increase its brightness, but this destroys at once the characteristic lightness and causing it to cool more rapidly, quite prevents the possibility of working it in the proper ductile and malleable condition. The Murano material is worked as the ancient Venetian glass made on the same island used to be, and all the old methods have been

be ready at the exact moment. He touches the bowl with it, and the two adhere like sealing wax. A pull asunder and one dexterous twist forms the stem of the wine glass, upon which three little lumps of glass are then stuck and stamped as strawberries, and the whole is again introduced into the furnace, where it would instantly droop out of shape but for the deft manipulation which it undergoes. By the time it is heated, the boy is ready with another globe of glass, perhaps of a different color, which he causes to adhere to the bottom of the stem. The man spins it around between his shears, nipping part of it almost off, and thus gaining the right quantity of metal for the foot, no less and no more. One tap on an iron ledge breaks off the superfluous piece, and leaves a small hole at the point of fracture. Once more the action of the fire is called in to soften the brittle material, and when the pear-shaped end comes out the points of the closed shears are introduced to widen the opening into a cup-like form. A small lump of aventurino is by this time on the end of the boy's rod, melted, and only saved from dropping by his dexterity. One touch and it adheres to the end of the cup just formed. He pulls it out and winds it around, adhering as it goes to the edge. Again the fire does its duty, and then the artist finishes the form of the foot, detaching immediately the bulb at the top from his hollow rod. Another rod, with a molten piece of glass, is prepared for him by the boy's ready co-operation, and is pressed against the center of the foot, to which it adheres. Into the fire goes the whole piece, and when withdrawn the bowl of the glass is partly shaped by the shears, aventurino wound around the edge as before with the foot, a last heat, and with artistic care the delicate, crocus-like bowl, some day to contain the sparkling wine, is completed.

Observing the Eclipse.

Advices received July 19 from Japan say the expeditions to take observations of solar eclipses are reaching Japan. The steamer Coronet, with United States observers, reached Yokohama on June 22. Among the party were Capt. and Mrs. A. James, Prof. and Mrs. Todd, Chief Engineer Pemberton, U. S. N.; E. A. Thompson, Chief Astronomical Mechanic; Mr. Gerrish, of Harvard University, Frank Thompson, Assistant Astronomical Mechanic; Dr. Adriance, and A. W. Francis. On the Island of Yezo the eclipse will begin at 3:05 on August 9 and will last two minutes and forty seconds. It is proposed to establish a large equatorial mount which will have twenty-five instruments pointed at the sun and which will be operated automatically by electricity. The instruments will take between 500 and 600 negatives of the corona. Prof. Schaeberle, of Lick Observatory, California, arrived a week before the Coronet. The French scientific party came about the same time, and the party of English astronomers is expected in three days. Prof. Schaeberle goes to Akkesh and Prof. Todd to Mobetsi.

CONSCIENCE AND HEALTH.—He that loses his conscience has nothing left that is worth keeping. Therefore, be sure you look to that. And in the next place look to your health, and if you have it, praise God, and value it next to a good conscience, for health is the second blessing that we mortals are capable of—a blessing that money cannot buy. I therefore value it, and be thankful for it.—Izaak Walton.



THE ILLUSION EXPLAINED.

discovered, or at least the same effects have been produced. The fiamma, perhaps more strange than beautiful, the millefiore, the smelze, including perfect imitations of agates, chalcedons, lapis lazuli, etc., for mosaic, the aqua marina, rich ruby colors, the brilliant aventurino, all are here, and many other kinds of work, some of which are imitations of the old glass, and some new inventions.

The tools used are a hollow reed of iron, a few instruments like shears, of different sizes, and a stamp with a strawberry shaped die. The end of the rod is dipped in molten glass of, say, ruby color, and a portion accu-

Changing Seed Wheat.

BY F. D. COBURN, SECRETARY KANSAS DEPARTMENT OF AGRICULTURE.

It is no longer disputed that in ordinary farming the sowing of any given variety of winter wheat continuously on the same land or in the same locality results in its deterioration, both as to yield and quality.

The numerous letters which each season brings this office relative to this condition, and as to the sections from which the most profitable change of seed is likely, render it desirable to publish the views of those having the largest opportunity for observation in such matters, and noting intelligently some of the practical results. No other men are in such close touch with wheat raisers and the wheat interest as the millers, and the tenor of the valuable information secured from them in reply to inquiries is well shown in extracts from some of their letters as follows :

Mr. C. V. Topping, of Enterprise, secretary of the Kansas Millers' Association, writes : "The belief existing among winter wheat growers that sowing the same varieties year after year in the same latitude lowers the yield and quality, is correct. C. Hoffman & Son, extensive millers at this place, last year imported from Russia some of the pure Russian wheat. (This is the Crimean winter wheat, and I would suggest for accuracy and definiteness that the name Crimean winter wheat be used for this Russian variety and that the misnomer 'Turkey' or 'Rice' wheat be discarded.) A number of years ago the same quality of wheat was imported, and by comparing the wheat that has been sown here year after year with that just imported, it shows a very marked difference both in quality and certainly in yield of bushels per acre as well as in the wheat product. The flour from pure Russian wheat is much stronger than that from wheat that has been sown and resown in this country for a number of years. This is very noticeable in European markets, where the Hungarian flours command from 20 cents to 50 cents a barrel more than our ordinary Russian wheat flours. Farmers should change seed certainly every five years, and I consider that it would pay them well to change every three years. For this part of the State (Dickinson county) I would recommend sowing the hard varieties, and in exchanging seed the central part of Kansas could use that grown in either northwestern or northeastern Kansas ; but of course where it can be had, the pure Russian seed from the Crimea should be used."

Mr. J. W. Krehbiel, manager of the Moundridge Milling Company, at Moundridge, McPherson county, says: "The nature of our wheat undergoes some change, and it would be very profitable to procure new seed at least every ten years. I think a decline in the original qualities for milling will first be manifested, but as the plant loses its native European hardiness (as the Turkey variety), it will not stand the winter so well and consequently give a less yield. Our locality would want Turkey wheat imported from Russia. Mr. B. Warkentin, of Newton, now has some of this new seed imported, and the use of such should be a great profit to our farmers."

Mr. Warkentin above mentioned, president and manager of the Newton Elevator and Milling Company, Harvey county, says experience teaches him that by sowing the same variety year after year in the same locality, it changes its qualities both as to yield and milling. "Our so-called Turkey wheat is becoming softer from year to year. Of course the growing season has much to do with this. If the wheat can mature without too much rain, the per cent of gluten, which makes it valuable, will be much larger than otherwise. In my opinion our farmers should change seed at least every four or five years, and new seed should be imported from the Crimea about every six or eight years. Farmers should be encouraged to exchange for seed from a distance of say 25 miles, as I have found it a great means of improvement. Our soil and climate seem best adapted for the red, hard winter wheat, with which we can easily compete in the world's markets. I have twice within the past ten years imported fresh seed wheat from the Crimea—the wheat known as the Russian-Turkey, the beneficial results of which are very plainly seen in our country."

Geo. H. Hunter, president of the Hunter Milling Company, at Wellington, Sumner county, writes : "Our considerable experience and observation is that continuous sowing of the same wheat in one locality is injurious to it. We have tried wheat from other portions of our county and find a change, especially from the north, is beneficial. We would not recommend seed obtained from too great a distance, say not to exceed 150 miles, but it has been our experience that when new seed has been brought in either wheat or corn, the yield has been much better for several years. Generally a poor yield makes a poor product, which is the only complaint we would make as to quality. It is a good rule to change seed at least once every five years."

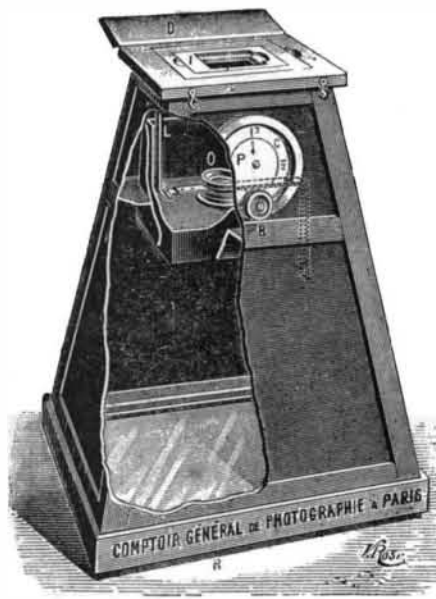
The Messrs Colburn, of the Queen Bee Roller Mills, at McPherson, write in substance as follows : "We believe our farmers should change seed as often as once in three or four years ; not necessarily to imported seed but to that raised in a different locality. This we be-

lieve with the exceedingly good milling qualities of the Russian, or as we term it, 'Kansas Hard,' would hold both the yielding and milling qualities intact for many years. While we are firm believers in changing seed at least once in three years, it is a fact that prevailing climatic conditions make a wonderful difference in the outcome of quality and yield, whether the change is made or not. Everything does not depend upon seed ; we have seen the choicest of seed sown, only to produce the meanest wheat, and vice versa. If some of the imported was available each year, it would certainly tend to hold up the reputation we are now attaining in the world's markets on 'Kansas Hard Wheat,' as well as the flour made from it."

Prof. C. C. Georgeson, of the State Experiment Station, at Manhattan, says : "That wheat does deteriorate in the course of years under the care that the average farmer gives his crop I think must be conceded. The yield becomes less, the grain of an inferior quality, and the millers complain that the proportion of bran to flour is too large. From what section it would be most desirable to procure a change of seed cannot be answered positively. In our experience here at the station we have as a general thing had the best results from wheat grown in about the same latitude to the eastward of us. The start for our best yielding varieties came from Virginia, Maryland and Ohio. A variety of superior merit, produced only by selection and culture under the most favorable conditions, can maintain its superiority only when grown and selected with the same care which produced it. Our farmers do not give their wheat that care and culture, and the legitimate result is that it runs out. The main cause of deterioration then is under the control of the farmer himself."

NEW PHOTOGRAPH ENLARGING APPARATUS.

The enlarging of small pictures is one of the most agreeable operations of photography. The new enlarger



SIMPLE PHOTO-ENLARGING APPARATUS.

designed by J. Carpenter has the form of a truncated rectangular pyramid. Its base is formed by a plate holder, with a cover, R, 18x24 inches, and its vertex by a series, I, of kits for holding the negatives, from 9x10 inches to 4 1/2 x 6 inches. A screen, D, covers them when the apparatus has to be taken into the daylight. In the base frame there is a perfectly smooth glass, 18x24 inches, without ridges or defects. On the inner side of the glass is applied the sheet of gelatino-bromide of silver paper, held in contact with the glass by a little board and a lock or spring at the two ends. The first board, instead of being of one piece, has an intermediate square, thus making it possible to take a photo copy 13x18 inches.

In the interior of this truncated pyramid are lens boards that can be moved upward or downward by the button, B, in the center of which is a rectilinear objective, O, which exactly covers the maximum dimensions of the photograph to be enlarged. At the proper time the other lenses, mounted on a sheet of steel, L, move when the button is operated until they are in focus and are supplied with proper diaphragms.

When the button, B, is moved, it carries with it an exterior disk, P, which carries an arrow placed like one of its radius and which moves concentric with a graduated circle, B, showing the different degrees of focus, for different sized pictures, that may be desired.

Let us rotate the disk so the needle will indicate the figure 4 and at the same time produce a slight noise by an escapement, and it will show that the objective has been automatically located so that the dimensions of the enlarged image will be four times as great as those of the little pictures and the whole of the central part of the little picture will have the maximum dimensions, 18x24 inches.

After the paper is adjusted in position on the base plate in the dark room, the hinged cover, D, is folded over the negatives. The whole apparatus may then be

removed into the light and the exposure made by opening the lid, D, for a few seconds.

If it is desired to enlarge on a plate instead of on paper, the former is put in the place of the latter. We believe that the enlarging apparatus to which we refer shows real progress in the practice of enlarging.—La Fotografia Practica.

Rules of the Road at Sea.

Congress has finally passed and the President has approved the bill making amendments to the proposed new rules of the road at sea. It was hoped that the new rules could be proclaimed this summer, but this is now found to be impossible.

It is the intention of the State Department to communicate with all foreign governments, asking that they agree upon some date for the rules to go into effect. It is expected that about March 1, 1897, will be the date selected. When it is agreed upon the President will issue a proclamation. The law as it goes on the statute books is as follows :

Article 15. All signals prescribed by this article for vessels under way shall be given :

"First—By 'steam vessels' on the whistle or siren.

"Second—By 'sailing vessels' and 'vessels towed' on the foghorn.

"The words 'prolonged blast' used in this article shall mean a blast of from four to six seconds' duration.

"A steam vessel shall be provided with an efficient whistle or siren, sounded by steam or by some substitute for steam, so placed that the sound may not be intercepted by any obstruction, and with an efficient fog horn, to be sounded by mechanical means, and also with an efficient bell. (In all cases where the rules require a bell to be used a drum may be substituted on board Turkish vessels, or a gong where such articles are used on board small seagoing vessels.) A sailing vessel of twenty tons gross tonnage or upward shall be provided with a similar foghorn and bell.

"In fog, mist, falling snow, or heavy rainstorms, whether by day or by night, the signals described in this article shall be used as follows. Namely :

"(A) A steam vessel having way upon her shall sound at intervals of not more than two minutes, a prolonged blast.

"(B) A steam vessel under way, but stopped, and having no way upon her, shall sound, at intervals of not more than two minutes, two prolonged blasts, with an interval of about one second between.

"(C.) A sailing vessel under way shall sound at intervals of not more than one minute, when on the starboard tack, one blast ; when on the port tack, two blasts in succession, and when with the wind abaft the beam, three blasts in succession.

"(D.) A vessel when at anchor shall, at intervals of not more than one minute, ring the bell rapidly for about five seconds.

"(E.) A vessel when towed, a vessel employed in laying or in picking up a telegraph cable, and a vessel under way which is unable to get out of the way of an approaching vessel through being not under command, or unable to maneuver as required by the rules, shall, instead of the signals prescribed in subdivisions (A) and (C) of this article, at intervals of not more than two minutes, sound three blasts in succession, namely : One prolonged blast, followed by two short blasts. A vessel towed may give this signal and she shall not give any other.

"Sailing vessels and boats of less than twenty tons gross tonnage shall not be obliged to give the above mentioned signals, but if they do not, they shall make some other efficient sound signals at intervals of not more than one minute.

"Section 2. That said act of August 19, 1890, as amended, shall take effect at a subsequent time, to be fixed by the President by proclamation, issued for that purpose."

Navy Dry Docks in the United States.

With the completion recently of the Port Royal dock on the Atlantic coast and the Port Orchard dock in Washington, on the Pacific, the United States Navy Department now has ten large dry docks completed for war ships as follows :

Location.	Material.	Length		Width Floor.		Water.	
		Ft.	In.	Ft.	In.	Ft.	In.
Boston.....	Stone.	391	30	27	0	27	0
Brooklyn.....	Stone.	350	30	25	6	25	6
Brooklyn.....	Timber.	530	50	25	6	25	6
League Island.....	Timber.	530	50	25	6	25	6
Norfolk.....	Stone.	360	30	24	0	24	0
Norfolk.....	Timber.	530	50	25	6	25	6
Port Royal.....	Timber.	600	50	26	0	26	0
Port Orchard.....	Timber.	650	50	26	0	26	0
Mare Island.....	Stone.	530	30	28	0	28	0

—Marine Review.

THE medical department of the War Office of the British government considers that the Roentgen rays are so practical that two sets of Roentgen ray apparatus have been sent up the Nile to be used by the army surgeons in locating bullets in soldiers and to determine the extent of fractures.