Science and Art.

The Art of Dyeing.—No. 36.

DYEING STRAW.—PURPLE—Into a clean copper kettle containing two gallons of boiling water, put four ounces of alum, and about forty drops of the muriate of tin, and boil two hats in this for half an hour, then lift them. Now throw out the liquor in the kettle and put in the same amount of clean hot water, and the clear liquor of half a pound of logwood well boiled. Let the hats now be entered in this and boiled for twenty minutes; then take them out, wash them, and they are done. A little sumac added to the preparing liquor improves the color. For a darker color, add more dye stuffs.

Alkanet root makes a very beautiful light purple color on chip hats. Boil one hat in one gallon of water with six ounces of alkanet root, and half an ounce of alum, for one hour; then lift and wash.

GREEN COLOR—To two gallons of boiling water in a kettle, add two ounces of the extract of indigo, two ounces of alum, one-quarter of an ounce of sugar of lead, and the clear liquor of half a pound of fustic well boiled. Let two hats be boiled in this for twenty minutes, then lifted out and washed. A kind of greenish slate color, sometimes fashionable, is dyed on straw hats, by coloring them a light blue first, with the prussiate of potash and copperas, and then dipping them for fifteen minutes in a weak fustic liquor.

Many dyers use turmeric for dyeing the yellow of their greens on straw, but this is wrong, as this color cannot stand exposure for more than a few hours to bright sunlight. Fustic, therefore is the best coloring material for the yellow of straw hats dyed green. Ebony is also good, but is too expensive.

YELLOW—Straw can be dyed a beautiful yellow with the bichromate of potash and lead. The straw is handled for about fifteen minutes, in a warm liquor containing three ounces of sugar of lead dissolved, then lifted aud introduced into another warm liquor containing one ounce of the prussiate of potash dissolved, and in which it is handled for ten or fifteen minutes. These quantities of dye stuffs will dye one pound of straw. We have never seen yellow straw hats, but no one can account for fashionable taste—such hats may yet adorn the heads of our gay belles.

MAROON AND CRIMSON—Into a clean kettle containing four gallons of hot water, near the boiling point, add four ounces of alum, a wine glass full of the muriate of tin, and two ounces of sumac. Handle three straw hats in this for half an hour; then lift them, cool, and rinse in six gallons of clean cold water. Clean out the kettle, and put into it four gallons of hot water, and the liquor of one pound of peachwood well boiled, and four ounces of logwood; handle the hats in this at a scalding heat for one hour, and they will be a maroon. With one half the quantity of logwood, they will be a crimson. Dark colored straw bonnets must be washed well in cold water before they are dried.

Cudbear dyes a number of beautiful shades of ruby color. Take one pound of cudbear and place it in a vessel containing four gallons of water, and one ounce of soda, and boil three hats in it for half an hour, then take them out and they will be a beautiful color.

The size that is used for stiffening colored straw hats, is white glue. It is dissolved in hot water, then suffered to cool before it is used. It is better to dip the hats in a solution of this size, than to rub it on as some do, with a sponge. Black straw hats should be dipped into a hot solution of glue, for stiffening; it takes away all the brownish appearance of an excess of logwood, and leaves them a shining jet color. Gum arabic kept dissolved in a bottle, is put on black straw hats with a sponge after they are pressed, to give them a glossy appearance.

Railroad Drawbridge.

The accompanying engravings are views illustrating the improved railroad drawbridge, for which a patent was granted to J. K. and W. P. Gamble, of Philadelphia, on the 7th of last May.

Fig. 1 is a plan view of the drawbridge partly open, and showing the main and branch tracks and the switch rails, and the main track connected with the branch inclined tracks by the switch rails. Fig. 2 is a vertical longitudinal section, and fig. 3 is a vertical transverse section through line *x x*, fig. 1. Similar letters refer to like parts.

GAMBLE'S RAILROAD DRAWBRIDGE.

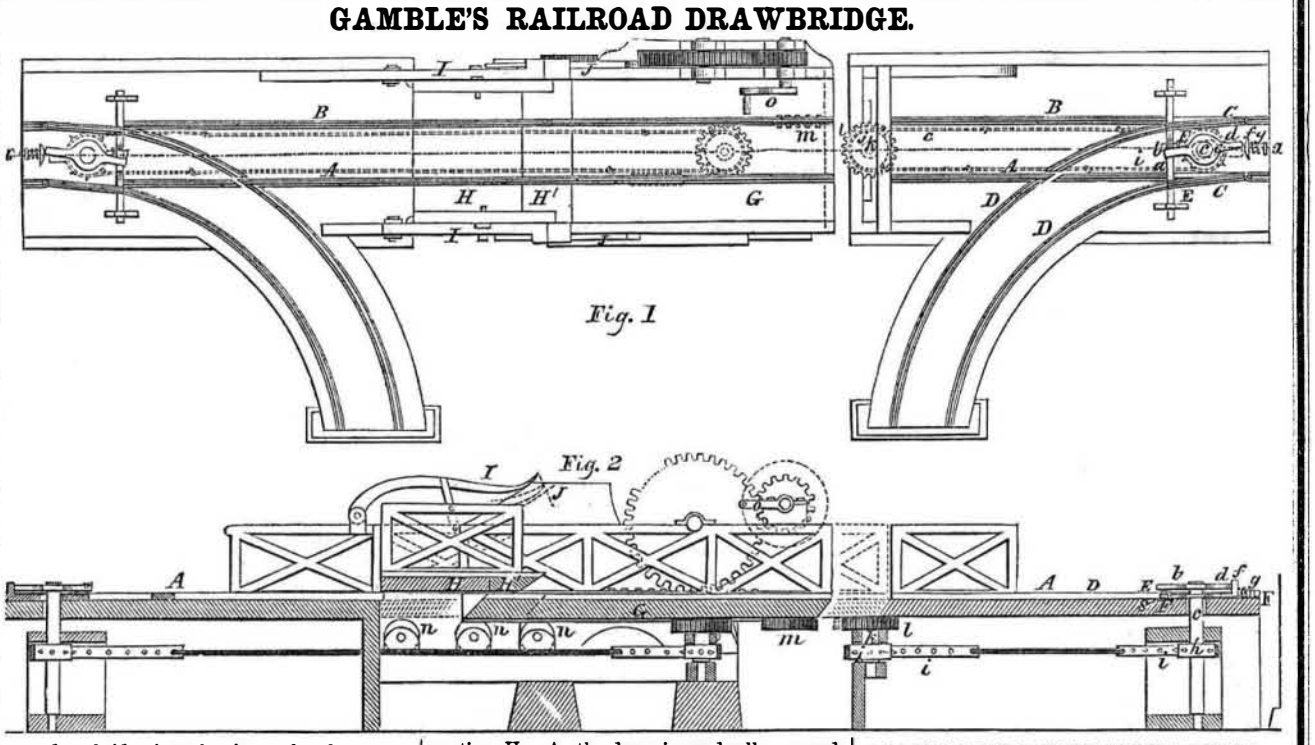

Fig. 1

Fig. 2

A B represents the main track passing over the bridge. C C are the switch rails placed on both sides of the river at about one hundred yards from the ends of the bridge. D D, in figure 1, are the safety inclined branch tracks with which the switches, C C, connect when the draw of the bridge is open. The switch bar, E, has a notch, *a*, cut in its top, in which a shifting arm, *b*, fits. This arm is secured in a revolving vertical shaft, *c*.—There is another arm, *d*, similar to *b*, secured in the same shaft. F is the bolt for locking the switch bar for a given time. It is made broad at its center, and has a flat slot, *e*, cut in it, in which shaft *c* plays, as the bolt is locked or unlocked. On the outer end of bolt F, a cam, *f*, is secured, which serves to draw the bolt out of its connection with the switch bar, either when the switch is in line with the branch track or the main track. The spiral spring, *g*, on the end of the bolt, is for throwing the bolt into connection with the switch bar at the time required. *h* is a chain wheel on the shaft, *c*, and *i* is a chain passing around it, connecting it with the chain wheel, *j* fig. 2. On shaft, *k*, a cogwheel, *l*, is secured, which turns with the shaft, and is operated by rack *m*, which is on the bottom of the draw. This wheel and the rack bar are so situated that they do not operate until the draw is nearly closed, or as it just commences to open. The arrangements described for locking and unlocking the switch is the same for both ends of the bridge, and the description of one answers for the other—both are operated at the same time by the movement of the draw. G is the draw which is moved back and forth horizontally over the friction rollers, *n n n*, and under the swinging

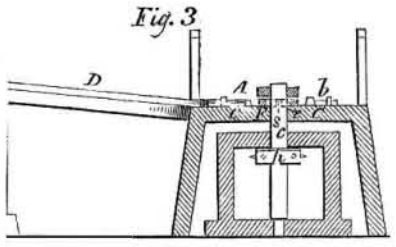

Fig. 3

open drawbridge into the river, whereby a number of valuable lives were lost. The nature of the invention consists in a self adjusting means to be hereafter described, for operating and arranging switch rails with a side steep inclined track at each end of the bridge, and with the main track, whereby the switch rails are made to connect with side inclined tracks, simultaneously with the slightest opening of the draw, and then to shift and close the main track over the draw when the latter is perfectly closed, thus locking and shifting the switches by the slightest motion of the draw. Thus, if a train be running towards the bridge, the draw being open and no signal seen, it cannot run into the water through the gap, but will run up the inclined side branch track, and its progress be arrested.

portion, H. As the draw is gradually opened the levers, I I, are made to lift the part, H, as it (the draw) is forced under it. The loose ends of these levers are made to move upon inclined ways, J J, which are attached to the draw, G, and consequently lift the swinging portion sufficiently high to allow the draw to pass under. The cogged gearing, as shown in fig. 1, by the large wheel taking into the rack on the draw, moves it back and forth. As the draw, G, is opened, it does not lift the part, H, at first, but moves under the hinged portion after the switches have been shifted to the branch track, and then commences to lift the part H. The object of this is, that the draw cannot be opened the smallest distance before the switches are changed. As the draw closes, the swinging part, H, descends, and occupies its proper position, for as the inclined ways, J J, are moved from the lifting levers, the latter are caused to descend the inclines, and allow the draw to occupy its position, and thus all the parts are self-adjusting.

OPERATION—By turning the crank, *o*, the cog gearing will be set in operation when the draw will commence to move horizontally, and to open gradually. As soon as the draw commences to move, the teeth of the rack, *m*, will take into the cog wheel, *l*, and cause it and the shaft, *k*, to turn and give motion to the band or chain, *i*, and to the wheel, *h*, and shaft, *c*. As soon as the shaft, *c*, commences to turn, the shifting arms, *b*. and *d*, are operated. The arm *d* being made to turn slightly and bear rigidly against the cam, *f*, which is secured fast on the bolt, F, and compresses the spiral spring, *g*, and forces the cam outward sufficiently far to draw the bolt from its connection with the switch bar. As the bolt is withdrawn from one of the two holes, *t*, in the switch bar, the arm, *b*, is made to bear on the side of the notch, *a*, in the switch bar, and force the said bar to another position, and cause it to throw the switch rail in connection with the branch track; as soon as this takes place, the arm, *d*, escapes by the cam, *f*, and the bolt is again forced by the spring into the other hole, *t*, in the switch bar, and made to lock the switch for a given time. To shift the switches from the main to the branch track, the draw is opened but very slightly. After the switches are thrown in connection with the branch track, the draw may be opened its full width without the least danger of the cars running into the water, as they will pass up the steep inclined branch track, when their progress will be arrested, and they can then descend again and remain stationary until the draw is closed.

Signal poles 20 feet high are also placed on each side of the road opposite the switch bars. These have colored indicators on the top for day signals, and two deadened sides and one clear side in the lantern for night signals.—These are operated simultaneously with the draw and switches, so that every means for safety are brought into requisition. For more information see advertising columns.

The object of this improvement is to prevent such accidents as occurred at Norwalk, Ct., two years since, by the cars running through the