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DEAD WEIGHT IN RAILWAY CARS.

To the student of railway economy the subject of dead weight in cars tends to call up something more than a common-place discussion. It was one of the subjects brought up at the meeting of the Master Car Builders' Association, but the members were reticent in expressing their views and to offer suggestions. It was considered by some that to increase the size and carrying capacity, especially of freight cars, would produce the result of decreased weight, but the committee to whom the subject was referred did not feel qualified to advise, and did not unanimously recommend such a change. They did say, however, that timber and iron is used in excess of strength. They thought by a careful selection of timber as to quality, and a careful judgment of its proportions, together with the same selection in regard to iron, associated with good and careful workmanship, lighter cars equally as serviceable could be produced.

Proportions of materials and good workmanship were especially descanted upon. In experience the only parts of car frames brought to notice in which proportions had been reduced were window posts and roof carlines. The former had been made two inches thick, but had been reduced to one inch and one eighth. The service and life of the reduced proportions was declared equal to the former. Roof carlines had formerly been made two inches thick and now were made only one half that thickness. Iron carlines used to support monitor roofs were formerly made 2 x $\frac{5}{8}$, but were now made 2 x $\frac{3}{8}$.

In conclusion, the committee advised to not materially lessen the bottom timbers, but they thought that above the sill an excess of timber and iron had been employed. They advised to discard all unnecessary timber and use skeleton construction in all places possible. For inside work, where strength was unimportant, wood as light as could be obtained should be preferred. One of the main things to be borne in mind was to place timbers of all kinds so that it should be strong in the direction of the strain, and to reduce the thickness as much as it would bear and do the service required.

In the discussion that followed, it was thought by some that it would be economy if box cars were increased in size and made so as to carry a load of fifteen or sixteen tons. If this could be done by only adding five hundred or two thousand pounds to each car as now constructed, it would reduce the number of cars per train, and also be advantageous by bringing the weight hauled nearer the power that moves it. In a report of an experiment made of a car that had been constructed with increased length and capacity, of twenty-five tons, and loaded with that weight, the result was the springing of the axles about three sixteenths of an inch.

It was thought that nearly all of the car bodies, as now made, would easily carry fifteen tons, but it was a settled conviction that the ordinary axle would not bear the load. There were not enough of standard axles in use to justify the variation of the old rule of ten tons as a load for a car. It was thought that if fifteen tons was to be made the maximum of load, in addition to strength demanded in axles, the drawhead timbers and framing of the trucks must be strengthened and more securely fastened.

PENS, INK, AND PENCILS.

Some little excitement has of late been created among the manufacturers of and dealers in stationers' wares by the introduction of pens, sold under the name of "miraculous pens," "cold water pens," etc., which by simply dipping the pen in cold water will enable one to write without the use of an inkstand.

The first instance that we find of this class of pens is that shown in the English patent No. 3,946, of 1873,, which describes a pen made of thin plates overlapping each other, between which is to be placed "ink paper," or the plates are to be coated with "chemical matters" that will, when dipped in water, produce fluid ink; but the methods of preparing the "ink paper" or the "chemical matters" are not given.

Another pen of this class was patented in this country by L. B. Bertram, Nov. 14, 1876, No. 184,319 (who also has an English patent for the same, No. 3,187 of 1874). This pen has a barrel so shaped as to receive and hold a "cartridge" of solid ink, the ingredients of which are not stated.

A third solid ink pen was patented in this country by Leon Fargue, June 12, 1877, No. 191,950 (patented in France Aug. 30, 1876), and is sold, we believe, by Faber, under the name of the "miraculous pen." It is, however, simply an ordinary pen having its concavity filled with solid ink prepared of coloring matter derived from coal tar products mixed with any sufficiently adhesive substance, such as gum, honey, glucose, or glycerin.

The pens sold under the last patent are being extensively introduced into the market, and are therefore imitated by other manufacturers. One of these imitations, prepared with ink of various colors, we find sold with a printed slip bearing the words: "Inks patented, March, 1865," but the only ink we find patented in "March, 1865," is that described in the patent 46,684, which is for the use of one of the salts of aniline, known as "rosine," for making red ink. Nothing is said in the specification about solid ink, or of any other color than red. There is also another solid ink pen sold having stamped upon it, "Pat'd 13th Dec'r, 1870," which patent, upon examination, proves to be for a peculiar form of fountain attachment, and has nothing to do with solid ink.

Within the last three or four years several inkstands provided with solid ink have been introduced under the name of "Inexhaustible," "Magic," etc., one of which we fully described, with an illustration, on page 306 of vol. 30. The use of solid ink in this manner was not new at that time, but simply a revival of an old idea, as an inkstand to be filled with solid ink is described in the English patent, No. 4,435, of 1820, and the following recipe is given therein for a suitable ink: 8 ounces of honey, 1 yolk of egg, 1½ pints extract of galls, 3 ounces gum arabic, 1 ounce sugar candy, 1 ounce indigo, ½ pint decoction of logwood, 2 ounces lampblack, 2 ounces willow wood charcoal, 3 ounces sulphate of iron, and 2 ounces blue galls in powder.

Another English patent, No. 8,175, of 1839, describes a solid ink prepared as follows: A thick paste is made by pouring a decoction of Campeachy wood upon 3 drachms of catechu, 1 drachm of extract of hœmatoxylon, 10 grains of acetate and hydrate of deutoxide of copper, 1 scruple of sulphate of alumina and potash, 1 drachm of gum arabic, 1 drachm of sulphate of protoxide of iron, and a variable quantity of sulphate of indigo. This paste when dried may be cut into blocks of suitable shapes and sizes, which, when dissolved in water, will form a good ink varying in color according to the amount of indigo employed. To make a semi-solid ink there should be added from a half to one drachm of sugar or molasses to the above compound.

Besides these English patents, we find one granted in this country to J. B. F. Jud, of New York, Feb. 10, 1874, No. 147,384, for writing inks of various colors in the form of pastes, from which the following formulas are extracted:

"To prepare my improved concentrated black ink, take 4 parts of bichromate of potash, pulverized, and mixed with 25 parts of acetic acid, 50 parts of liquid extract of logwood, ¼ part of picric acid, 10 parts of pulverized sal sorrel, 10 parts of mucilage, and ¼ part of citrate of iron, and mix well. The liquid extract of logwood is prepared by mixing 3 parts of an extract of common commercial quality with two parts of water.

"My improved red ink is prepared by taking 1 part of red aniline mixed with 10 parts of acetic acid, 5 parts of citric acid, and 25 parts of mucilage, all well mixed. For use, mix 1 part of the paste with 16 parts of water.

"My improved blue ink is prepared by taking 2 parts of aniline blue mixed with 10 parts of acetic acid, 5 parts of citric acid, and 40 parts of mucilage, all well mixed. For use, mix 1 part of the paste with 8 parts of water.

"My improved violet ink is prepared with the same ingredients, in the same proportions, as blue, with the difference that violet aniline is used instead of blue aniline.

"My improved green ink is prepared by taking 1 part of aniline blue, 3 parts of picric acid mixed with 10 parts of acetic acid, 3 parts of citric acid, and 80 parts of mucilage. For use, 1 part of this paste is mixed with 8 parts of water.

"To prepare my concentrated copying ink, take 6 parts of pulverized bichromate of potash, mixed with 10 parts of acetic acid, and 240 parts of liquid extract of logwood, and add a pulverized mixture of 35 parts of alum, 20 parts of sal sorrel, and 20 parts of mucilage. Mix well. For use, 1 part of this paste is mixed with 4 parts of hot water."

These inks are described as leaving no sediment, as drying quicker on paper than the ordinary inks, and as being non-corrosive.

As connected with this matter of pens and inks we may mention that, after considerable litigation before the Patent Office authorities, extending over two years, a patent was issued June 26, 1877, to C. Walpuski, of Yonkers, N. Y., for an indelible or copying pencil, of which the writing made with it can be as readily copied as if written with copying ink.

Indelible (not *copying*) pencils have long been known and patented both in this country and in Europe. The English patent, No. 2.316, of 1858, describes a compound for indeli ble pencils designed for marking clothes, etc., which consists of 1 part of wax, 1 part of hard stearine or spermaceti, 2 parts of powdered plumbago, and 1 part of vermilion. These ingredients are to be heated and ground together to form a base, to 1 part of which is to be added 3 parts of nitrate of silver.

Another English patent, No. 2.771, of 1859, gives seven different compositions for making indelible pencils, as follows: 1st. Nitrate of silver, anhydrate of potassa, carbon, and olive oil; 2d. Caustic potassa, nitrate of silver, steatite, carbon, and olive oil; 3d. Caustic potassa or soda, nitrate of silver, fuller's earth, steatite, carbon, and olive oil; 4th. Caustic potassa, nitrate of silver, talcose slate, carbon, camphor, and olive oil; 5th. Anhydrate of potassa, iodine, oxide of lead or litharge, vegetable carbon, steatite, pipe clay, and camphor dissolved in oil; 6th. Anhydrate of potassa, iodine, carbon, nitrate of silver, steatite, pipe clay, fuller's earth, and camphor dissolved in oil; 7th. Carbon, steatite, fuller's earth, nitrate of silver, iodine, caustic potassa, and oil saponified, oil of tobacco, and neat's foot oil.

On May 31, 1859, an American patent was granted to E. P. Clark for an indelible pencil for marking clothes, made by dissolving 1 oz. of glue in 1½ ozs. of water, and adding ½ oz. of nitrate of silver, 6 to 10 drops of nitric acid, ½ oz. of lampblack, and ⅛ oz. of brown sugar.

The same inventor obtained another patent July 10, 1866, for a different compound for the same purpose, made by melting 1 part of nitrate of silver in a crucible, to which is added about ⅓ part of black lead, and from ¼ to ½ part of calcined gypsum. A small quantity of lampblack or asphaltum may be added or wholly omitted.

Another compound for an indelible pencil was patented May 14, 1867, to S. C. Pruden, which consisted of 1 oz. of alum, 1 oz. of sugar, ¼ oz. of gum arabic dissolved in water, mixed by slowly melting in a greased pot, and adding as