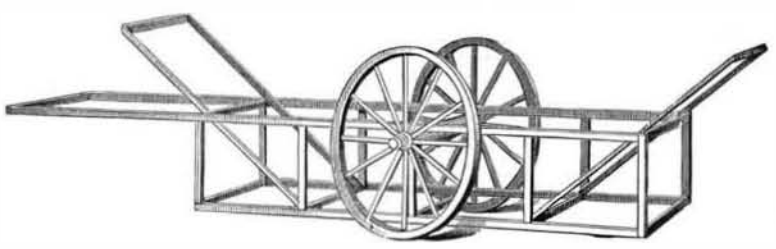
FARM HAND CARTS.

There are many occasions when a wheelbarrow is too small, and a larger hand cart will answer the purpose and save the hitching up of a team to a wagon. A farm cart can be made at a very small expense after the plan shown in the accompanying engraving, which we transfer from the *Farm and Fireside*. There is very frequently an old pair of wheels that have outlived or outlasted the other parts of the wagon, and will serve an excellent purpose for the running gear of the farm cart. If the cart is to be mostly used for drawing coarse material, like straw, hay, green fodder, etc., the body should be low for the greater convenience in loading and unloading, and increased ease and safety in the transfer.

The engraving shows how a rack can be made so that the load is brought down to a low and handy point. The frame may be eight feet long, three feet wide, or any other size desired, with a depth depending upon the size of the wheels.



The bottom of the frame should be a few inches above the ground. The engraving gives only the frame with the end wings on for drawing coarse material. The side wings are for covering the wheels, and may consist of bent half poles of hickory, fitted into arms placed to the front and rear of the wheels, much in the same way that the hind (and sometimes the fore) wheels are protected in the common low, or flat, hay rigging. If a tight box is needed, it can be made of light stuff, and either permanently attached to the frame or placed in the frame as the work requires it.

A hand cart upon the farm, or for use in gathering leaves and conveying newly mown grass from lawns, is very useful. The simplicity of the device renders it easily made by any unskilled person, and it will be found a handy implement for many other uses than those named about a gentleman's place. It costs but little, and saves much time and labor. There should always be a wheelbarrow and a hand cart on every well regulated farm.

Carding and Bleaching of Ramie.

The society for promoting the ramie industry in France has approved of the decorticating machine of Messrs. Labarie and Berthat. By it the difficult problem of separating the ligenous matters from the fiber has been solved. The invention of a method of preparing the fiber for spinning remained, and this appears to have been made by M. Scheifner.

The fiber is placed upon a horizontal endless band, which carries it to a pair of fluted drums. These distribute it to a cylinder, which is covered with teeth, about 3 millimeters in diameter, and 3 centimeters long. Then it passes another cylinder, having teeth, 1½ millimeters in diameter and 20 millimeters long, and then to the third yet smaller. Between the cylinders and above them small rollers, covered with carding, direct and maintain the fiber. The motion of the cylinder increases in rapidity from the coarsest to the finest in the proportion 10, 20, and 40. Two fine roller-cards deliver the fiber to a drum containing a system of jaws, operated by eccentrics and cams. An intermitting rotary movement is given to the drum, and when it stops, the pair of jaws opposite to the latter of the small cylinders seize and close on a portion of the fiber, which they submit to the action of a card drum making 50 turns a minute. This mechanical combing is so repeated on a pair of adjoining and similar drums that the portions of the fiber which have been pinched by the jaws are now combed. The fiber is again carded and run off in a continuous band. To remove the mucilaginous and ligneous portions which still remain, the fiber is steamed with the vapor of water acidulated with hydrochloric acid. This operation is followed by a bath at a temperature varying from 80° C. to 120° C., containing from 5 to 10 per cent of carbonate soda made caustic by lime. Then follows the bleaching, which comprises four distinct operations:

1. Make a bath of four times the weight of the fiber, containing 10 per cent chlorinated lime and 5 per cent hydrochloric acid. Enter and steep for from fifteen to thirty minutes.

2. Make a bath of eight times the weight of the fiber, containing 10 per cent of Epsom salts; the chlorine remaining from the last bath will combine with a portion of the magnesia; this compound will assist in the bleaching without acting injuriously on the fiber.

3. Make a bath containing 5 per cent carbonate of soda, and enter fiber, in order to convert the magnesian salt into the carbonate.

4. Neutralize any remaining chlorine by the action of sulphurous acid.

After bleaching, pass through bath of carbonate of soda, and then through bath of dilute hydrochloric acid, which serve to divide the fibers very finely, and give them the luster of silk. Finally, to increase their flexibility and softness, make use of the following soaping:

Soap two parts, carbonate of soda half part, water 100 parts, brought nearly to a boil. For the same purpose exposure to the vapors of glycerine is sometimes preferred.

Houses and Homes in the Great City.

The population of New York city is now nearly 1,500,000, and for dwelling purpose in whole or in part there are said to be 78,368 houses. Of these 49,565 are exclusively occupied as dwellings. The total number of families is 200,000, and of this number only 32,100 own their houses. The remainder pay rents. Within a comparatively brief period large numbers of what are known as apartment houses or flats have been erected. For the most part they consist of large buildings about 50 feet wide, 90 feet deep, and 6 stories high. Through the center is a hall and stairway. On each side of the hall way on each story, the space is occupied by a series of connected rooms, small in size, ordinarily intended to consist of a parlor, kitchen, dining room, bath room, and three bed rooms, with sundry closets. These apartments, collectively called "a flat," are cramped and contracted, affording but a limited amount of light and air. The rentals run from $30 to $70 per month, depending upon the location of the building.

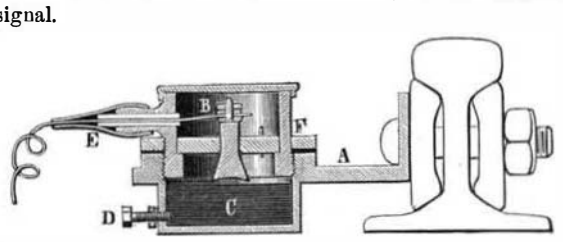
For better flats the rents are from $100 to $500 per month; for the latter sum large and superior apartments, in a ten story fireproof building may be had, with passenger elevator, etc. For entire dwelling houses, of 3 or 4 stories, with 9 to 13 rooms, the rentals vary from $600 a year to $3,000; the finer houses costing much more. The opening of the great bridge between New York and Brooklyn will, it is supposed, be of great advantage to the working people of New York, by enabling them to secure new and comfortable homes at moderate prices, without the necessity of the close crowding to which they are now subjected. Brooklyn has an unlimited area, it is supplied with horse cars running in all directions, and families of small means may rent full dwellings there for less money than they pay in New York for narrow and confined apartments.

ELECTRICAL RAILWAY SIGNALING.

We know the difficulty of making a good electrical contact when it is to be worked by a train running at a high speed, and that this contact is exposed to all kinds of atmospheric changes with scarcely any attention. It is to meet the requirements of a contact of this kind that M. L. Mors has invented the contact represented below, of which the principle and disposition are easily understood by reference to the description which accompanies the figure.

It consists in utilizing the vibrations produced by the passage of the train upon the rail to which it is fixed, to produce, by the movement of the mercury, a contact, in a hermetically closed space, which continues during the passage of the train. The contact works any apparatus whatever—bell, signal, disk, etc.

Experiments made upon the Paris-Lyon-Mediterranean line have given satisfactory results. The apparatus may be applied in any case where it is required that any mechanical vibration shall cause automatically a corresponding signal.



A. Lever, bent at the end to be riveted to the fish plate.

B. Contact cone, insulated from the iron box by a piece of ebonite or wood, upon which is a small plug, which is removed to replenish the mercury in the cup, if necessary. The large surface of the cone is about 2 mm. from the surface of the mercury in a state of repose.

C. Cup containing mercury. This cup communicates with the rail by the lever, and forms the "earth" pole (copper or zinc, according to position).

D. Small screw for regulating height of mercury, also for emptying the cup.

E. Nipple, through which is forced the junction cable, covered with a thick India-rubber tube; upon this tube is placed another tube, which covers the nipple in such a manner as to form a hermetically closed joint.

F. Iron cup containing mercury.—*Electrical Review.*

Fool's Gold.

As every substance has its shadow, everything genuine an imitation, it is to be expected that gold itself, the king of metals, should have its counterfeits, natural or artificial. Leaving aside the latter class, from time immemorial have men been deceived by those of the former, that is, in mistaking *other minerals* for gold.

A farmer's lad, slowly wading through a little stream, looks down into the water, and there, brought into view by the sparkling rays of the sun, he sees something glistening and shimmering so brightly that, seized by sudden curiosity, he runs his hand through the bed of the brook and brings up a handful of sand interspersed with shining yellow specks, and, behold, he has found gold! So he fancies, and the wonderful discovery is noised far and wide. A sample is quickly sent to some expert, and the report is, *mica in sand.* But who can blame the infatuated, self-deceived rustic? It looks like gold to him, and his castle in the air rises higher and higher until the rude fiat of the one who *does* know dashes it to the ground.

It is not so long ago that a pill-box containing an ounce or more of this mica bearing sand was sent to me to ascertain its value; and the sender was exceedingly disappointed when I informed him of its worthless character. And to-day I preserve some of it in my cabinet to show my visitors, and when the question is asked of each as to its nature, nine out of ten promptly reply that it is gold. Then, as a short, practical lesson in mineralogy of this metal, a second bottle, containing sand carrying the genuine article is brought out, and the difference is seen at once.

What assayer, mining engineer, mineralogist, or metallurgist has not had the same experience?

But mica is not the mineral that has done the most harm. Pyrites of iron and copper (copper pyrites or chalcopyrite), and pyrites of iron, the "fool's gold," have misled thousands.

In general appearance, this "fool's gold" is not so very unlike the true gold, that is, when the latter is not directly compared with it. It has a bright, yellow, metallic luster on the surfaces of unoxidized pieces and the interiors of freshly-broken pieces which are decomposed on the outside.

In 1608, about the time of the first settlement of Virginia, the colonists "believing that they had discovered grains of gold in a stream of water near Jamestown, the entire industry of the town was directed to digging, washing, refining, and loading gold; and notwithstanding the remonstrances of Smith, a ship was actually freighted with the glistening earth and sent to England" (*Willson's American History*). Whether this glistening earth was mica or minute pyrites in the clay or sand, history does not tell us, but presumably the latter, since it is found to a considerable extent throughout that State.

From that time down to the present, the mistake has often been made, *not* of imagining the pyrites to *contain* gold, but that it *is* gold.

There is probably no other metalliferous mineral more widely distributed than iron pyrites. It is found in rocks of every age, and almost in all parts of the world. Hardly a State or Territory of the United States but contains it to a greater or less degree, hence the great prevalence of the error concerning it.

To illustrate: a colored man in Mississippi mailed me a lump of this mineral, water-worn into a rude semblance of a gold nugget, and desired me to sell it for him! All I could do was to tell him of its worthlessness, and instead of a piece of gold worth $40 to $50 as he supposed, it was, in fact, not worth the postage paid on it.

To come nearer home: from two separate places in Michigan, and from two different counties in Wisconsin, has the same mineral, with the same question, been sent me, and lately an intelligent-looking gentleman brought me three or four pounds of this same delusive stuff, picked up on the shores of our lake, twenty miles north. It is needless, perhaps, to say that they were all disappointed in their great expectations.

From all that I have written there can as surely be deduced a moral as it can from the history of any nation, race, or sect, or life of any eminent individual, and the moral is, *a more practical education in all of our schools.*

I do not refer to those institutions which make a specialty of teaching geology, mineralogy, metallurgy, assaying, or other branches of science, but to the average, the common schools, for it is in such that the majority of our people obtains all it knows of books and learning. It should be as imperative for the scholar to know a lump of coal from a piece of iron ore, to be able to distinguish a copper ore from one of lead, to learn the difference between granite and limestone, between "fool's gold" and real gold, as it is for him to learn that six and seven do not make eleven or that the wonderful English language is capable of pronouncing *rough* as *ruff* and *bough* as *bow!*

It is not necessary to make of the youth whose entire school education is acquired in one or two years, an expert mineralogist—there are limits to all things—but simply to know more of the material things, such as he is likely to, meet with in his every day life.

To give a point to my moral and to return to my subject, let the one who finds something bright and *yellow* and imagines it to be gold try to cut it (if it be large enough to handle) with his knife. If it cuts easily (somewhat like lead) and flattens by use of hammer and anvil, it probably is what it is thought to be, at all events it is worth investigating. If, on the contrary, the specimen is too hard to be cut (iron pyrites), or crumbles instead of being sliced (copper pyrites), it certainly is *not* gold. Finish the test by placing some of the suspected mineral, powdered, in a common iron spoon over a fire. If, when it has been well heated, fumes arise and a smell as of a burning match is perceived, then pyrites is present, for it is the sulphur leaving the iron (or iron and copper) with which it was united to form the pyrites that causes the fumes and odor.

In conclusion, let the enthusiastic seeker of the precious metal remember the ancient but wise adage that "All is not gold that outward shewith brighte."—*Walter Lee Brown, in Mining Review.*