larger and better plan. A spider has been seen to make three different balloons before he was satisfied with his experiment. Then he will get in, snap his guy rope and sail away as gracefully and supremely independent of his surroundings as could well be imagined.

Now who knows but this fellow gave the Montgolfiers their first notions of travelling through the air. When these men constructed their first balloon, in 1782, no human being was bold enough to go up in it, but they placed in the car a sheep a rooster and a duck. They all came down safely, and a young Frenchman named Rosier and the Marquis of Arlandes soon made a successful ascension.

One of the Montgolfiers' balloons fell in a village, and the villagers, supposing it to be a demon (its bound along the ground, the noise and smell of the escaping gas confirming the idea), shot at it and beat it to pieces with clubs.

It seems strange that the mind of man, which has made such wonderful discoveries in steam, electricity and general science, has not done much with it, as a means of travelling, since its invention a hundred years ago.

Inventions.

Boiler Explosions.—M. Treve publishes in the *Moniteur Industriel* a plan for diminishing boiler explosions, which are due to leaving the boiler full of water, which by boiling parts with its air. M. Boutigny had previously proved that water in this condition is in the spheroidal state, and liable to explosion. M. Treve advises the injection of air before reheating the water, and the use of a thermomanometer, which would indicate whether the vapor pressure is below that to be expected from the temperature of the water.

Incombustible Paper.—At a recent meeting of a French Society, Mr. G. Meyer has exhibited a new paste combination designed for the manufacture of incombustible cardboard or paper of all sorts and shades. The inventor did not wish to make known at the time the chemical composition of the paste, and also of a new ink exhibited with it, as the patents he had applied for in Germany and America, had not yet been obtained. He made known the fact, nevertheless, that asbestos was the principal thing employed in the manufacture of his incombustible paper.

He presented specimens of writing, printing, engraving, etc., made with his inks of different colors, and also showed a water-color drawing that had been submitted to the fiery ordeal of the potter's furnace. The painting had preserved all its brilliancy and the paper all its flexibility. By request, the inventor for a few minutes exposed to a gas flame a sheet of his paper, upon which he had written with ink of his composition. Neither the ink nor the paper changed. In order to demonstrate by a most conclusive test how great a heat the paper and ink were capable of withstanding, Mr. Meyer then placed a lithograph, fifteen by sixteen centimeters, between two layers of glass in a state of fusion. On removal, the paper was found to have completely resisted the action of the heat, and the engraving to have preserved all its sharpness.

Preservation of Railway Ties.—A few interesting facts are published in the English journals, showing the relative value of different methods of injecting railway ties. Upon the road from Hanover and Cologne to Minden, fir ties injected with chloride of zinc required a renewal of twenty-one per cent. in eleven years; birch ties injected with creosote required a renewal of forty-six per cent. at the end of twenty two years; oak ties injected with chloride of zinc required a renewal of about twenty-one per cent. at the end of seventeen years: while the same kind of ties in their natural state require a renewal of at least forty-nine per cent. at the end of a like period. The conditions in each of these cases were very favorable for obtaining reliable proofs; the sub-soil of the road was good; the non renewed ties showed, when cut, that they were in a sufficiently good state of preservation.

Upon another line where the oak ties were not injected, it was necessary to renew the ties in the proportion of seventy-four per cent. at the end of twelve years; these same ties injected with chloride of zinc required a renewal of only 3·29 per cent. at the end of seven years, while such ties injected with creosote required a renewal of only 3.09 per cent. at the end of six years.

A Scheme for Dredging the Red Sea.—Now that so many persons are engaged in making what they can out of Egypt it is interesting to find one disinterested person proposing a speculation of which the object is not to put money in the pockets of the promoter, but to implant or confirm faith in the breasts of all men. The Abbé Moigno has written a preface to M. Lecointre's "Compagne de Moise pour la sortie d'Egypte," in which he advocates the promotion of a joint stock company, with a view of exploring the bottom of the Red Sea, and especially the bitter water lakes. In a German account of the project, it is justly described as "one of the boldest." "It is nothing less," continued the writer, "than to search the bottom of the Red Sea to discover there the proof of that great event narrated by Moses 3 000 years ago. To provide the needful funds to carry on excavations which would have for their results the restoration to light of the remains of the Egyptian armies engulfed in the Red Sea, with the chariots, horses, arms, treasures, archives and perhaps the King himself—that Pharoah who was conquered by Moses—this will indeed be a noble enterprise. Buried in the masses of salt of the bitter lakes, concealed at different places by thick beds of salt, these historical remains are perhaps in a state of preservation unexpected to us." The Abbé estimates the cost of the excavation at 300,000 francs, and against expenditures he places nothing in the way of possible returns. It may be suggested without irreverence, however, that if the Abbé Moigno should succeed in disinterring but one indubitable wheel of Pharoah's chariot he might make no end of money.

The steamer City of Fall River.—The steamer City of Fall River, which has been recently added to the Fall River line between New York and Boston, exhibits some decided innovations. The engine, of 2,000-horse power, was designed and built by Messrs. A. & W. Fletcher of New York City. It is a compound beam engine, fitted with the Morgan feathering paddle-wheels, and supplied with steam by a Redfield boiler, all of which features are unusual. The steam-cylinders are 44 inches diameter by 8 feet stroke, and 68 inches by 12 feet stroke. The wheels are 25 feet 6 inches in diameter. The boilers are of Otis steel, and are tested to 150 pounds pressure per square inch. The boat is 260 feet long, 41 feet beam, 17 feet deep. Over the guards the breadth is 73 feet. The draught of water, loaded with 600 tons of freight, is 12 feet. This steamer has made the 181 miles from port to port in 10½ hours, and has made 17 an hour. The coal consumption is small, 20 tons per round trip.

Rubber Stamp Inks.—The following proportions are said to give an excellent ink, which, while not drying up on the pad, yet will not readily smear when impressed upon the paper, Aniline red (violet), ninety grains, boiling distilled water, one ounce; glycerine, one half teaspoonful, molasses, half as much as glycerine. The crystals of the violet dye to be powdered and rubbed up with the boiling water, and the other ingredients stirred in. Another indorsing ink, which will not dry quickly on the pad, and is quickly taken by the paper, can be obtained according to the *Papier Zeitung*, by the following recipe: Aniline color in solid form (blue, red, etc.), sixteen parts; eighty parts boiling distilled water; seven parts glycerine, and three parts syrup. The color is dissolved in hot water, and the other ingredients are added whilst agitating. This indorsing ink is said to obtain its good quality by the addition of the syrup.

A Useful Kind of Solder.—A soft alloy which attaches itself so firmly to the surface of metals, glass, and porcelain, that it can be employed to solder articles that will not bear a very high temperature can be made as follows:—Copper-dust obtained by precipitation from a solution of the sulphate by means of zinc, is put in a cast-iron or porcelain-lined mortar, and mixed with strong sulphuric acid, specific gravity 1.85. From 20 to 30 or 36 parts of the copper are taken, according to the hardness desired. To the cake formed of acid and copper, there is added, under constant stirring, 70 parts of mercury. When well mixed the amalgam is carefully rinsed with warm water to remove all the acid, and then set aside to cool. In 10 or 12 hours it is hard enough to scratch tin. If it is to be used now, it must be heated so hot that when worked over and brayed in an iron mortar it becomes as soft as wax. In this ductile form it can be spread out on any surface, to which it adheres with great tenacity when it gets cold and hard.