MISCELLANEOUS.

New Self-Adjusting Carriage Springs.

No department of mechanical industry has been subject to more innovations than that of carriage-making, not only in the shape of the body, but also in the arrangement of the wheels, axles, and springs These latter, in particular, have been indefinitely experimented upon, and if fixed laws could always be laid down after a series of trials, the form and arrangement of carriage springs would long ago have been a settled fact. That such is not the case it is superfluous to mention, for no springs hitherto made for carriages have combined the requisite lightness and strength, they being either defective in one or the other, some makers sacrificing strength to lightness, and others vice versa. To attain both these advantages combined is the great desideratum, and we are happy to record the union of these two qualities in a new description of carriage spring invented by M. G. Hubbard, of Rochester, and which was patented July 22nd, 1851. The improvement consists in using a curved bottom and springing a bar around it, which thus adjusts itself to any weight placed upon it. The elastic force of the spring, in this position is exerted upon the whole bar, so that, in its operation, the material is not in the least disorganized nor its properties impaired. Another of the peculiarities of this improvement is the employment of wood for springs, which forms a distinguishing feature of the invention.

Every previous attempt of this kind has been unsuccessful from the difficulty of obtaining suitable proportions, and particularly the requisite length, which obstacles have been triumphantly overcome by the inventor. The use of wood for springs appears destined to form an epoch in the history of carriage building, and so successful has been its application, that Mr. Hubbard, i about to employ them for railroad cars. They can be used for every description of vehicle, however heavy, and some idea of their strength may be conceived when we state that those intended for stage-coaches will require over two tons to bring them down to their bearing, although they weigh less than 50 lbs. They will spring as delicately while carrying but one passenger as when carrying twenty, and it must be evident to any one that in this position they combine a degree of strength that never can be used, and durability in proportion to their simplicity and strength. A buggy with these improved springs was exhibited to us by Mr. Lewis, the agent for the patentee, and we can safely say that it exceeds anything of the kind that we have ever before seen, uniting everything desirable in a carriage. In this opinion we are not singular, for its merits were tried at the New York State Agricultural Meeting, in July, when the Committee spoke in the most flattering terms of the improvements, and awarded the patentee their highest premium, which has also been bestowed at other similar exhibitions.

For further particulars respecting these new improvements, address M. G. Hubbard, Rochester, N. Y.

Performing Somersets from a Balloon.

A late Paris letter says—The aeronauts are bent upon rendering their profession every day more and more perilous. During the whole of the past year the ascensions from the Hippodrome have been made with gymnasts suspended beneath the car, executing their terrible exercises during the passage of the balloon to the clouds. The last experiment was the reverse of this. It consisted of the descent of the parachute from an enormous altitude, with M. Godard hanging below it. He turned somersets and performed all kinds of rigadoons in the air, from the time when the cord was cut till it was time to look out that he touched the ground with his feet. The experiment was successfully and gracefully performed.

This is the most wonderful feat of lofty tumbling ever performed by a mortal man. It takes the French to do up these things in grand style.

A meteor of a very large size was seen to fall at Roma, Texas, on the night of the 20th ult. The phenomenon was accompanied by a slight shock of an earthquake, which agitated the river for a few moments, and shook the windows in frame houses. The meteor appeared about the size of a thirty-two pound cannon ball, and caused an illumination as brilliant as the noonday sun would.

[Reported expressly for the Scientific American]

Lectures on Chemistry.

[An abstract of a Lecture on Combustion delivered before the Mechanics' Institute, at Cincinnati, Ohio, by Prof. Chas. W. Wright.]

By combustion is commonly understood the chemical union of a combustible body with oxygen gas—the latter being called the supporter of combustion; but this definition is incorrect as a philosophical expression, for no one substance is a supporter of combustion, nor is any one intrinsically a combustible body. Thus, if a chandelier be suspended in one of the large gasometers, at any gas manufacturing establishment, and atmospheric air transmitted through it, it can be ignited as it issues through the burners, and will burn in the same manner as ordinary coal gas does in the atmosphere, showing that coal gas will support the combustion of air. The proper definition of combustion is, therefore, the chemical combination of two or more bodies with the evolution of heat, and sometimes light. The terms combustible body and supporter of combustion, however, retained by chemical writers, and the use of them, though expressive of an erroneous idea, are convenient, and will not mislead if properly explained. If a body be volatile, its combustion is attended with flame, as sulphur, phosphorus, &c.; if not volatile, the combustion, though attended with the evolution of heat and light, is not acaompanied with flame, as charcoal, coke, iron, &c. Most organic bodies burn with flame from the fact of their containing a large quantity of hydrogen, the most volatile body in nature.

Ordinarily the combustion of a body in air is extremely rapid; but sometimes it takes years for its completion. Thus, when iron is burned in oxygen gas, or the smith's forge, great heat and light are evolved, and the process is soon completed; but in the rusting of the same quantity of iron in the air, an equal amount of heat is evolved, although it may take years to complete the operation. The heat being given out gradually in the latter case, s not taken cognizance of. The gradual combination of a body with oxygen is called "low or slow combustion." The rusting of all metals, as iron, zinc, &c., is due to low combustion. Low combustion is more striking among organic bodies. Thus, the rancidity of fats and fixed oils, are instances of low combustion. They become rusty, in fact, by combining with the oxygen of the atmosphere, and undergoing partial combustion. Butter is more prone than most fats to this kind of change, and hence the most of it sold in cities is rancid or rusty. The decay of all organic matter is nothing more than its low combustion. We have instances of it in the decay or rotting of wood, where the same amount of heat is evolved as if it had been burned in an ordinary fire, but being given out slowly, it is not taken notice of. The conversion of the proto carbonate of iron into the peroxide, in the disintegration of rocks, is another instance of low combustion, and is the cause of their changing from a dark color to a light yellow.

The quantity of heat evolved, during the combustion of a body in air, is in proportion to the amount of oxygen consumed, and does not depend upon the amount of the combustible employed. Thus, one pound of oxygen in combining with charcoal, heats from 32° to 212° 29 pounds of water; and hydrogen, under the same circumstances, heats 29½ pounds of water from 32° to 212°, so that it matters but little what combustible is used, the amount of heat evolved being regulated by the quantity of oxygen consumed. That substance is most valuable as fuel which will consume the largest amount of oxygen in a given time, and yields the smallest quantity of volatile product after combustion. The cause of the evolution of heat during combustion, has never been explained, and although numerous theories have been offered, and many experiments instituted to account for it, we know no more about it now than we did in the days of Lavoisier.

The force that can be generated by combustion is almost incredible; thus, Sir J. Herschel has calculated that in the proper combustion of a bushel of coal, under a steam boiler, a force can be obtained sufficient to elevate 70,000,000 pounds weight a foot high, and yet the sun's rays exerted the same amount of force in decomposing the carbonic acid absorbed by the leaves of the plants during the growth of their woody fibre, out of which the coal was formed. Another interesting circumstance, connected with wood, coal, peat, and all ordinary combustible substance, is the fact that they are the only bodies in nature that are fitted for fuel, the only ones that pass off in invisible and in small quantities, harmless forms of matter—the only ones that are re-converted into the very same condition that they occupied before they were consumed.

Combustion takes place only at the point where the bodies that burn are in contact; this is best seen in an ordinary flame, as that of a candle. All common flames consist of a hollow luminous shell of light, the interior of which is filled with combustible gases, as may be seen by depressing a sheet of wire gauze over them, which gives a section of the flame. Flame is composed of three distinct portions, each possessing different properties. The inner dark portion of flame consists of a cone of vaporized combustible gases, which may be drawn out by means of a small tube, and ignited. Another portion, which may be described as the middle cone, consists of little lumps of charcoal, or lamp-black, heated to whiteness. In this part of the flame the hydrogen of the combustible gases alone burns, it having a greater affinity for atmospheric oxygen than the carbon, combines with it, displacing the lumps of carbon, which, from their high temperature, constitute the luminous part of flame. At the outer portion of flame another cone may be observed where the light gradually disappears, and here the combustion is complete; the little lumps of carbon being consumed, light is no longer evolved, although the temperature is higher in this part of the flame than any other. The luminous part of flame, then, consists of particles of solid matter heated to whiteness. Gaseous matter cannot be heated white-hot by the most intense degree of heat. The proper place for igniting a combustible body, in all ordinary flames is near the summit of the outer cone, where the temperature is highest, and the air in excess.

Mackerel Fishing.

Reports from the Gulf of St. Lawrence state that the mackerel fishing has been unusually unsuccessful this season. This is attributed by fishermen not to a want of fish, for there was abundance, but to the prevalence of high winds, which by agitating the water rendered it muddy and prevented the fish from biting. On the Bay Quinte considerable quantities of white fish are caught.—This year about 1,500 bbls. have been taken. The exertions of the fishermen are receiving a new stimulus in the increased price of their wares. Before this season the price has seldom exceeded $3 a bbl., but owing to an American demand it has now risen to $4,50 and $5. White fish are also caught on some parts of the Georgia Bay, but the enterprise has not been carried on to any great extent.

The Cocoa-Nut Tree.

Mr. Treloar of Ludgate Hill, London, the cocoa-nut fibre manufacturer, has published an interesting pamphlet, showing the uses to which the various parts of the cocoa-nut tree are applied. The purposes of utility to which this tree may be put are very numerous. The Cingalese have a saying, "that it has ninety-nine uses, and the hundredth cannot be discovered.". From the full-grown leaves are formed mats, carpets, baskets, sails, tents, and liquid measures. The cocoa-nut oil yearly imported into England is valued at £100,000. By means of mechanical processess, secured by patent, the value of cocoa-nut fibre has been much increased. It has been found suited for the production of articles of great utility and elegance of workmanship. A Great Exhibition prize medal was awarded to Mr. Treloar for the best specimens of matting, mats, brushes, mattresses, and other articles made of cocoa-nut fibre.

The Manager of the Electric Telegraph Company at Glasgow, Scotland, states that the transmission of intelligence over the wires was suspended in consequence of an aurora borealis, which prevailed at the time.

Anthracite Coal for Locomotives.

The annexed is from the Philadelphia Ledger. We have seen the accounts spoken of in our English exchanges about the performance of McConnell's engines manufactured by Fairbairn, but the description was too vague about their construction to warrant us in asserting them to be like those of Mr. Millholland: "Some months ago we gave a rough description of the Millholland engines, used on the Reading Railway, in this State. They have been steadily in work ever since, doing full duty, and making extra speed with passenger trains, and the company now consider the superior adaptation of this fuel to travelling engines as a settled matter. In England and France, coke is used at great cost. But we find in a London paper of last month, that two new express passenger engines, essentially on Mr. Millholland's plan, are in use on the London and Northwestern Railway, giving great satisfaction. No credit is given by that paper to our Pennsylvania friend, from whom we presume the principles of the invention were derived. But the engines have the same gas burning chamber behind the fire box, supplied with hot air, in the same way substantially. There appears, perhaps, one novelty, viz.:—The heat from the boiler is used to dry the steam before its effective force is given to the pistons. Mr. McConnell, the assumed inventor, claims that anthracite coal from the mines of South Wales can be used in these engines, at a saving of one-half the cost of bituminous coke, and a complete riddance of the many inconveniences incident to other fuels. The presumption expressed is with us a fact established."

Railroad Accident.

At a trial of a new locomotive on the New Albany and Salem (Ind.) Railroad, a collision occurred with a hog train, by which Geo. Sewer had one of his legs so severely lacerated that amputation was found necessary. He also received other injuries. His life was despaired of. Another man, who had taken a drove of hogs to New Albany, was instantly killed. Amos Sliter, one of the conductors, was badly hurt, and a number of persons were slightly injured. The engineer and fireman jumped off before the collision occurred. The locomotives were injured to the amount of about $7,000.

Railroads in Canada.

A Canadian agent has gone to England to arrange with Peto, Brassey & Co., for the construction of the Trunk line of railway.—The contractors are to get about $40,000 a mile; and the road is to be of a very surperior character, with tubular bridges, such as have never been constructed on this continent.

Anastatic Printing.

In his Report for the year 1845, the Commissioner of Patents says:—"The extraordinary art of anastatic printing has been patented in this country by foreigners, and, as far as ascertained, has been practised with success in the city of London. The patent was granted for the process, and not, of course, for the result or principle. The credit of the discovery and of the first successful production of copies from an engraving or other printed work, belongs to one of our own countrymen, Mr. Joseph Dixon, of Mystic, Conn., (now of Jersey City,) and according to the most creditable testimony, his results are far more perfect than any hitherto attained by others. Mr. Dixon has been for many years engaged in perfecting his art, and I can testify from personal knowledge of his success in this invention many years ago. But, as the office was not in possession of the details of his process, no reference could be made to him, and the patent was accordingly granted as above stated. Mr. Dixon's discovery is mentioned in a work entitled "Science Applied to the Domestic and Mechanic Arts, by Rev. Alonzo Potter, published in 1841, and in the same work is given a specimen of Mr. Dixon's printing."

The monthly statement of the Philadelphia Mint shows the receipts of gold for November to have been $7,260,000: the coinage $4,990,543. The total receipts for the past eleven months are set down at $47,699,354.