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New Motors.

During the past few months we have enjoyed the pleasure of witnessing the operations of three engines propelled by new agents never before successfully applied to driving machinery. These are, the engine of B. Hughes, in which the bi-sulphuret of carbon is employed as a substitute for steam; the "Cloud Engine" of Mt. Storms, in which a jet of cold air is mixed with the steam; and the third is the engine of Dr. Drake, of Phila., the motive agent of which is gas and air. The bi-sulphuret of carbon engine performed in a superior manner to steam in our presence; but we only witnessed two experiments, and have had no opportunity of testing it or seeing it tested under different conditions; we were pleased, however, with its performance. The "Cloud Engine," which was in operation at the Fair of the American Institute, gave evidence, in our presence, on one occasion, of being more economical than simple steam. How this was obtained by injecting a jet of cold air with the steam into the cylinder, we could not divine, nor did the explanations of the inventor satisfy us, but its superior performances have been endorsed by Horatio Allen, Esq., of this city, an engineer of distinguished reputation. C. W. Copeland, M. E., has also been making a series of experiments with the "Cloud Engine," and his report of it will, no doubt, throw much light on the subject. Every improvement in prime motors is of vast importance, but the advantages of any new engine must be clearly established before it takes the place of steam, and we are of the opinion it will not be easy to do this; still, we hope it may soon be done, as we wish for and welcome every new and useful improvement in science and art.

The other motor, called the "Ignition Engine," was lately erected by its inventor in the Crystal Palace, as noticed by us on previous occasions. After many failures, causing no small amount of mortification to himself, and disappointment to great numbers of curious spectators from far and near, the inventor at last, just as the Fair closed, discovered that the cause of his ill luck was owing to a deficient supply of gas. Having remedied the defect, we were invited, on the 20th inst., to visit the Crystal Palace once more, and see it operate for a certainty. We accepted the invitation, and did see it work freely and powerfully for a considerable period, at the rate of 60 revolutions per minute.

The motive agent of this engine is carburetted hydrogen,—the gas used in our streets and houses for illumination—and a mixture of atmospheric air. It is well known that when this gas is saturated with oxygen it becomes an explosive mixture, which, when ignited, suddenly explodes with great violence like gunpowder. Many attempts have been made to construct gunpowder and explosive gas engines, but Dr. Drake is the first inventor who has succeeded in harnessing this mighty agent, and making it submissive to his will in driving machinery; for this he deserves great praise. He commenced his experiments in 1837, and by perseverance and ingenuity has brought his gas engine to its present operative condition.

In external appearance Dr. Drake's machine bears a close resemblance to a horizontal engine. It has a piston and cylinder, but in its other parts a number of new devices are introduced that are not required for steam. Motion is produced by exploding gas in the cylinder, first behind and then in front of the piston, just the same in effect as steam is employed. At every stroke of the piston nine times more atmospheric air than gas is admitted to the cylinder; this is done by a peculiar valve, which takes in the proper quantity of air from the atmosphere, while the exact quantity of gas is being admitted through a pipe from the supply reservoir. The heat generated by the explosion of the gas is very great; the piston is, therefore, made hollow, while the cylinder is surrounded with a jacket, through which a stream of cold water circulates for re-

frigeration. Two red hot igniting capsules are placed through the side of the cylinder, one at each end. After the mixed gas is admitted it comes in contact with the hot iron, ignites, and instantly expands, giving motion to the piston. Valves of the puppet kind, operated by toes and springs, are used alternately to cover and uncover the igniting irons, as well as to open and cut off the gas supply. The mixed gas being composed of nitrogen, oxygen, and carburetted hydrogen, these, when ignited, unite chemically in the cylinder—suddenly forming carbonic acid gas, a little steam, and nitrogen. The amount of expansion is stated by the inventor to be twelve or fifteen times the original volume of the gases, so that the power obtained from a small volume of gas is very great. We had no means of knowing the amount of pressure on the piston, but Dr. Drake informed us that the engine could work up to the power of 20-horses. It is a little more bulky than a steam engine of the same power.

This engine can be set in operation in a few seconds when there is a supply of gas, which can always be had by keeping it ready made in a reservoir. In this one respect it has an advantage over steam. By the perfect combustion of fuel under a steam boiler, and under retorts to generate the gas, the expense of the two—gas and steam—may not differ much, to be used as motive agents; but there are great advantages on the side of steam. The process of obtaining steam is more simple than generating gas, and consequently cheaper. The construction of the steam engine is also more simple, and so are most of its appendages.—The action of the steam on the piston is altogether superior to that of an explosive mixture. Steam is rapid in its motion, silent, elastic, and equable in its pressure, making the piston move without jarring and noise. The explosive gas operates like small discharges of artillery; it expands much of its force suddenly on the cylinder heads, and shakes the whole machinery with great violence. This is a difficulty which cannot be overcome; it belongs to its very nature, and its continued use in a large engine would soon shake it to pieces. For these reasons we conclude that this new motor will never supersede the steam engine; but we entertain great respect for the sincerity, the ingenuity, the perseverance, urbanity and intelligence of its inventor.

Award of Prizes by the American Institute.

We present herewith the award of the prizes for novelties at the late Crystal Palace Fair, in as correct a manner as it was possible to obtain the same during the past week. This portion of the Institute's business appears to have been managed in a helter-skelter, old foggy, sort of a way, which is as disgraceful to the concern itself as it is injurious to the exhibitors and discourteous to the public. The managers have been bragging through the papers about the large number of prizes awarded this year, and the amount of money they have spent for the same; but up to this time they decline to tell, with much exactitude, who were the recipients of their medals, or for what they were given. They propose, so we understand, to keep their list as private as possible for some time to come, for the alleged purpose of revision, but in reality to yawn over. The operation will probably occupy all the active energies of this take-it-easy establishment during the remaining portion of the present year. Some time in 1856 an official list of the awards will doubtless be given.

The nomination of jurors, or examining committees, this year, appears to have been very unfortunate. We have seldom seen such displays of stupidity and ignorance as are manifested in some of the awards. Take, for example, the Wood Planing machines; the gold medal was given to an apparatus that, unless we are greatly misinformed, was incapable of successfully working an ordinary sized board. It was an imperfect machine, and generally stuck fast whenever the attempt was made to put it in operation. We have no doubt that it is a good invention, but it utterly failed in its performances at the Palace, and was far from being entitled to a medal. It barely deserved a diploma. On the other hand, there was Barlow's newly patented and truly novel planing machine in full practical opera-

tion at all times during the Fair, which was only deemed worthy of a silver medal.

A bed-quilt, which, we were informed, had taken eleven different premiums at as many previous Fairs of the Institute, being exhibited one year by Maria, the next by Jane, then by Elizabeth, and so on, received this year another silver medal; while the specimens of flax cotton, made by a new process, and justly regarded as one of the most important improvements of the day—exhibited by the Knowles Patent Linen Fiber Company—received a diploma.

A pair of unpatentable window sash hinges received the award of a silver medal; while an ingenious dove-tailing machine, by Mr. Gleason—a fresh invention, and one of the gems of the whole exhibition, so far as novelty and utility was concerned—merely received a diploma.

A wealthy confectioner on Broadway, N. Y., took a gold medal for a display of candies; while the Patent Bread of Messrs. Crum & Paul, made by a new method, undoubtedly of great value, was not noticed at all.

We might cover a page with contrasts similar to the foregoing, but it is unnecessary. Great dissatisfaction exists among exhibitors at the careless and ignorant manner in which many of the prizes were distributed. Although few of the disappointed competitors would, in any case, feel wholly satisfied, no matter how just the decisions, still, as we have shown, there appears to be good reason for complaints at this time. If the Premium Committee, in their doings over the list, can manage to correct some of the grossest of these errors, they will not only do an act of simple justice, but gain for themselves, and the Institute which they represent, a considerable degree of credit.

We subjoin our list, which, the reader must remember, is only intended to comprise the awards for the principal novelties in the exhibition. The premiums given for wigs, toupees, parasols, umbrellas, canes, bed-quilts, needle-work, hats, caps, and all the various articles of common use, we have purposely omitted.

Gold Medals.

- J. Echols, Columbus, Ga., Hydraulic Rock Drill.
C. B. Morse, Rhinebeck, N. Y., Wood Planing Machine.
Wheeler & Wilson, New York, Sewing Machines.
Howard & Davis, Boston, Mass., Sewing Machine.
G. Whipple, Brainard Bridge, N. Y., Knitting Machine.
American Stone Dressing Co., New York, Stone Dressing Machine.
Loudon & Co., New York, Expansion Bolt and Screw Fastener.
Machine Manufacturing Co., Boston, Rotary Cutting machines.
F. Ransom, Brooklyn, Anti-Choking Ship Pumps.
W. H. Bramble, Cincinnati, O., Grain Scales.
Geo. Vail, Morristown, N. J., Smt. Machines.
Danforth, Cook & Co., Paterson, N. J., Cop Spinning Frame.
Lowell Machine Co., Bobbin & Fly Frame.
N. Aubin, Albany, N. Y., Portable Gas Apparatus.
W. Porter, W. R. Porter, N. Y., Wood Gas Apparatus.
H. S. Leonard, Moodna, N. Y., Oil Tester.
C. Potter, New York, Printing Press.
J. Dixon & Co., Jersey City, N. J., Black Lead Crucibles.
Fairbanks & Co., New York, Scales.
Fenn & Baker, New York, Mathematical Instruments.
G. Tagliabue, New York, Meters.
Nathan Thompson, New York, Life Seat.
John Kennedy, N. Y., Marble Mantels.
F. G. Johnson, Brooklyn, Windmill.
American Plate Glass Co., New York, Plate Glass.
National Plate Glass Co., Lenox, Mass., Plate Glass.
Col. S. Colt, Hartford, Ct., Pistols.
World's Safe Co., New York, Bank Lock.
W. G. Creamer, New York, R. H. Brake.
H. N. Smith, Rochester, N. Y., Car Seat.
L. L. Smith, New York, Galvanic Battery.
C. L. Goddard, New York, Burring machines.
Leonard & Clark, Moodna, N. Y., Turning lathe.

Silver Medals.

- Webster & Miller, N. Y., Metal Bending and Tubing machine.
Liddeil, Kepler & Co., Erie, Pa., Shearing and Punching machine.
D. G. Condit, N. Y., Blind Slat and Tenoning machine.
Daniels & Raymond, Woodstock, Vt., Straw Cutter.
C. P. S. Wardwell, Lake Village, N. H., Tenoning machine.
Brown Bro., N. Y., Turning and Boring machine.
Lane & Bodley, Cincinnati, O., Power Mortising machine.
Ball & Ballard, Worcester, Mass., Planing machine.
Gay & Wood's patent.
C. B. Hutchinson & Co., Auburn, N. Y., Stave and Barrel machine.
N. G. Circular Molding Co., Circular Irregular Molding machine.
Ball & Ballard, Worcester, Mass., Sash, Molding, and Slat machine.
Burlley & Putnam, Boston, Dovetailing machine.
Southwick, Thomas & Co., Brooklyn, Match machine.
S. Carpenter, Flushing, N. Y., Self-acting Turning machine.
Crane & Tompkins, N. Y., machine for Turning Irregular Forms.
J. A. Conover, N. Y., machine for Splitting Kindling Wood.
Smith & Cowles, Amherst, Mass., Upholstery Shaving machine, and a Pelly machine.
J. B. Nichols & Co., Boston, Sewing machine.
Elliott Woodruff, New York, N. J., Self-acting Gate.
Klein, Whiting & Co., Bristol, Ct., Patent Thirty-Day Clock.
Allen, Thurber & Co., Worcester, Mass., Revolving Pistol.
H. N. Thistle, Wrought-Iron Cannon, with new method of loading.
W. B. Hartley, N. Y., new method of Twisting Gun Barrels.
Holmes, Valentine & Butler, N. Y., Rotary Door Lock.
J. H. Butterworth & Co., Dover, N. J., Combination and Perambulator Bank Lock.
G. M. Ramsey, N. Y., Rolling Hinges.
W. T. Ford, N. Y., Sliding and Folding Window Sashes.
A. D. Clark, N. Y., Door Fastener.
A. J. Starr, N. Y., Window and Sash Blind Adjuster.
L. Page, Cayceville, Vt., Car Brake.
D. A. Hopkins, N. Y., Car Coupling.
Carpenter & Powers, N. Y., Bag and Jack.
Peter Dorsch, Schenectady, N. Y., Car Wheel.
James Kelly, Sag Harbor, N. Y., improved Weighing Apparatus and Scales.
Mrs. G. Vane Beppe, Ovid, N. Y., Coarseness of Raw Silk.
Garrett & Co., N. Y., Coarseness of Raw Silk.
Alvin Ward, N. Y., Self-acting Turning Lathe.

- Glass Silvering Co., N. Y., Samples of Silvered Glass.
J. Smart, Philadelphia, Pumps.
G. Arthur Gardner, N. Y., Hand Rock Drill.
Hotchkiss & Sage, Windsor, Broome Co., N. Y., Frame Block for Mill Spindle.
W. P. Calender, New Orleans, Grain Mill.
Troy Portable Grain Mill Co., Troy, N. Y., Cob and Corn Mill.
J. Cochran, N. Y., Anti-Freezing Valve.
Vergennes Scale Co., Vermont, Platform Scales.
Troy Patent Cordage Co., Cordage machine.
Darlington & Co., N. Y., Oscillating Engine.
Fease & Murphy, N. Y., Model of United States Ship Niagara's engines.
Clark's Steam and Fire Regulator Co., N. Y., Steam and Fire Regulator.
J. Whitehead, Manchester, Counter Twist Speeder.
W. C. & J. P. Burnham, N. Y., Double Acting Pump.
J. P. & W. F. Dodge, Newburgh, N. Y., Anti-Choking Pump.
American Steam Gauge Co., Boston, Steam Pressure Gauge.
Novelty Iron Works, N. Y., Clocks, Steam and Water Gauges.
American Portable Gas Cooking and Heating Co., Gas Cooking Stoves.
S. Jøren, N. Y., Dry Gas Meter.
J. L. Donnell, N. Y., Kiddie's Gas Regulator.
R. Dugson, N. Y., Hydraulic Jacks.
H. M. & G. H. Babcock, Westbury, L. I., Polychromatic Lighting Pipes.
Wendell Wright, N. Y., Friction Clutch Pulleys.
H. W. & D. Davis, Yellow Springs, Green Co., Ohio, Parallel Vise.
G. Vail & Co., Morristown, N. J., Portable Steam Engines.
Brooks, Great Falls, N. H., Bar Level.
Farr, Briggs & Co., N. Y., Improved Candle Molds.
G. W. Leflow, Jersey City, Miter machine.
G. C. Wilkinson, N. Y., Bellows.
B. Brown, Lowell, Mass., Alarm Money Drawer.
C. Parker, Meriden, Conn., Jeweler's Vise.
J. Bronckhorst, N. Y., Cutting Machines.
S. A. Holmes, N. Y., Dentist's Acting Camera.
R. L. & C. H. Lundy, N. Y., Petrified Stone Drain Pipe.
W. Smith, N. Y., Petrified Drain Pipe.
Dr. D. C. Ankler, Plence of the Cashmere Shawl Goat.
F. Middle, N. Y., Calendar Clock.
J. S. Curtis, Hartford, Ct., Calendar Clock.
John Sherry, Sag Harbor, N. Y., Turret Clock.
A. D. Perry, New York, J. Beach-loading Luffe.
Farr Briggs & Co., N. Y., Candle Molds.

Fire Engines.

- FIRST CLASS.—No. 3, Brooklyn, First Cup; No. 13, Brooklyn, Second Cup.
SECOND CLASS.—No. 8, New York, First Cup; No. 29, New York, Second Cup; No. 11, New York, Diploma.
THIRD CLASS.—No. 28, New York, First Cup; No. 45, New York, Second Cup; No. 2, Newark, N. J., best truck with long ladder, and best running gear, First Cup; No. 13, New York, second best truck, Second Cup.
HOSE CARRIAGES.—No. 22, New York, Second Cup; Hose Carriage Phenix, Easton, Pa., Third Cup; No. 8, and No. 35, New York, Silver Medals.

Recipe for Making Gold.

Various have been the attempts of philosophers and alchemists, in all ages, to discover some easy process of obtaining that precious metal, which, to the generality of mankind, is the great talisman of happiness and bliss. Futile and impracticable as all such efforts have hitherto proved, the subject still maintains its interest, and people are quite as ready at the present time to hear a bout and engage in golden speculations as they ever were in the days of old. This fact prompts us in bringing afresh to the consideration of our readers a method to which we have, on several previous occasions, called their attention.

The process we are about to notice is not, we are happy to say, apparently one of a visionary character. It appears to be simple and practicable; we presume if faithfully followed, agreeable to directions, it will result as set forth. True, the amount of bullion capable of being made by any one individual, under the plan proposed, is not very large. It will not suddenly make him rich; but it will infallibly fill his pockets with plenty of loose change, and amply repay him for all the time and labor spent in its obtaining. Our recipe is as follows:—

Take in one hand a clean subscription paper, and in the other a fair copy of the SCIENTIFIC AMERICAN; thus equipped visit every shop, store, and dwelling in the town or village where you happen to reside; explain, in eloquent terms, to every individual who will listen, the nature, merits, and advantages of our valuable journal; wind up with a strong appeal to his or her good sense, and obtain a year's subscription if you possibly can; continue this course with perseverance, until a long list of subscribers has been secured; then forward the names and money to this office; and on the first of January next, provided your list is the largest, you will receive from us in gold the sum of one hundred dollars.

If another competitor, however, has carried off the largest sum, by sending a larger list, you will stand a chance for the second prize, which is seventy-five dollars, and so on down. Fourteen splendid recipes of this kind, for making gold, are offered by us; for further particulars see Prospectus on our last page, and then read, reflect, act. The opportunity is certainly a rare one.

Improved Marking Ink.

Mix 11 parts (by weight) nitrate of silver, 22 of liquid ammonia, 23 crystalline carbonate of soda, 50 of gum arabic, 2 of sap green, and 13 of distilled water. The linen printed must be exposed to the sun or pressed with a hot iron until the letters no longer increase in blackness.—[London Artisan.