

PRIZES FOR IMPROVEMENTS.

The Society of Arts, London, has lately issued a detailed statement of prizes offered for various practical improvements. We present the list, believing that, if our readers may not wish to compete, it will be suggestive of subjects for invention, and lead to new discoveries in other matters, if not in those here mentioned. We have recently published a list of five other rewards offered, for improvements pertaining to the use of gas, by the same Society, which it is unnecessary here to repeat.

The Council, in issuing this list of subjects and asking for communications upon them, state that they are aware that some of the suggestions put forth may, at first sight, appear difficult of realization. In some instances, the thing sought involves the use of known substances in the industrial arts in a manner in which they are not at present employed, but in which there is reason to believe they are capable of being used with economy. In other cases the aid of the chemist is sought to develop such a form of action upon the material used as will induce the creation of new industries, or aid the extension of old ones by economizing processes, render them less detrimental to health, or lessen the risk of accident to those employed.

Steam is the motive power now generally employed, but its use on common roads seems at present, for various reasons, inadmissible. Other agents, such as mercury, gunpowder, and petroleum, have been tried, but hitherto without success. There are, however, many other materials in Nature to which scientific men and others may well turn their attention for the development of power, and put them in a form which shall render them available to the engineer and mechanist. It is believed that not one of the objects here sought is incapable of realization; and the Council hope that men of science—engineers, manufacturers, colonists, and agriculturists—will combine with men of capital to realize and bring many of them into commercial use.

\$1,000.—SWINEY PRIZE.—JURISPRUDENCE: Under the will of Dr. Swiney, a silver goblet, of the value of \$500, containing gold coin to the same amount, is presented on every fifth anniversary of Dr. Swiney's death "to the author of the best published treatise on jurisprudence." The next award of this prize will be made on the 20th of January, 1874. Competitors for this prize should send in copies of their published works to the secretary not later than December, 1873.

\$500.—TREVETIAN PRIZE.—PRESERVED FRESH MEAT: The sum of \$500, placed at the disposal of the Council by Sir W. C. Trevelyan, Bart., with the Society's medal, is offered for the discovery of a process for preserving fresh meat in an uncooked or raw state better than by any method hitherto employed, applicable to the preservation of meat in countries where it is now almost valueless, so as to render it an article of commerce.

FOTHERGILL PRIZE.—Under the will of Dr. Fothergill, funds are bequeathed for the offer of a medal, and "the following subjects are proposed to the Society for their consideration: (1.) The best method of preventing destructive fires, and of detecting incendiaries. (2.) Of speedily extinguishing fires when water is scarce. (3.) Of speedily securing valuable property from the flames, and also from thieves. (4.) Of preventing or diminishing the numerous fatal disasters from fashionable muslin dresses catching fire, whether by rendering such dresses less combustible, or having constantly in readiness a large cloak of incombustible fabric, composed of asbestos or amianthus, with which instantly to envelop the whole body. Paper of this kind (incombustible) might preserve from fire valuable deeds and other manuscripts. A premium for the encouragement of such a manufacture is also recommended. The above to be varied at the Society's discretion." On the present occasion the Society's medal is offered as follows:

GOLD MEDAL.—UNINFLAMMABLE WOOD: For the economical production of an inflammable wood, so as to render buildings in which it is employed less destructible by fire.

HOWARD'S PRIZE.—GOLD MEDAL OR \$125: For the production of a traction engine of moderate power, capable of being employed as a substitute for horse power on tramways and in the streets of cities and towns. The engine to form one structure in combination with the tramway carriage. The power may be generated by any means, provided that noise, noxious fumes, and the discharge of refuse into the air or on to the road surfaces are avoided.

GOLD MEDAL.—For the discovery or manufacture of a means for safely and economically generating power, suitable for use in place of steam. It should be free from refuse, noxious fumes, and injurious effects on the metals with which it may be brought into contact, or on the workmen employed.

SILVER MEDAL OR STOCK PRIZE.—Under the will of John Stock, funds are bequeathed for the offer of a medal for the encouragement of drawing, sculpture, and architecture. **SHELL COMES.**—On the present occasion the Society's medal is offered to female artists, for the best cameo, designed and executed on any of the shells ordinarily used for that purpose.

GENERAL PRIZES—GOLD AND SILVER MEDALS.

MOLDS FOR METAL CASTING.—For the production of molds for casting, constructed without seams, and capable of resisting the temperature employed in running bronze and other molten metals; specimens of the molds and casts to be sent to the Society.

COATING VESSELS.—For an economical method of coating large vessels of zinc, such as baths, so as to present a bright and clean surface, not readily oxidized and as durable as a tinned or japanned surface.

VACUUM.—For the introduction and use of a vacuum, for the drying and preservation of fruits and vegetables, either with or without heat of low temperature.

VACUUM.—For any new and economic application of a vacuum in the preparation or finish of manufactured goods.

ELASTIC TUBING.—For an elastic material for tubing suited to the conveyance of gas, and not liable to be affected by moisture, alterations in temperature, or to be acted upon by the gas itself.

ROLLERS FOR PRINTING.—For a composition for feeding rollers for printing by cylinder machinery, similar in consistency and texture to the gelatin rollers used in letterpress printing, but adapted for working in water colors.

IMPROVED CHEMICAL BALANCE.—For the best chemical and assay balance, suitable for the use of students and experimentalists, which (loaded with 600 grains in each pan) will show a difference of .005 or less. To be sold at a moderate price.

INCOMBUSTIBLE WICK.—For the production of an incombustible wick, suitable for use in lamps.

CASTS (WHITE MARBLE).—For a means of casting ornamental panels, or marble groups of figures, flowers, etc., in white marble, so as to retain the transparency of the marble itself, as well as the polished surfaces of artistically finished works.

WASTE COAL.—For a more economical and efficient method than any at present in use of preparing waste coal, so as to render it available as fuel for engineering or domestic purposes.

COAL WORKING MACHINERY.—For an account of the modes at present in use for getting coal, and suggestions for improvements calculated to render the use of machinery more general in coal mines.

LIGHTING COAL MINES.—For a means of lighting coal mines, so as to increase the light in the workings, and at the same time reduce the risks arising in the use of the ordinary miner's lamp.

TUNNELING.—For the best account of the machinery used in tunneling, with suggestions as to the best means of applying either compressed air or water power in the working or getting of minerals.

FREEZING MACHINE.—For a machine or process, either chemical or mechanical, for lowering the temperature of substances by the abstraction of heat, more effectually and at a less cost than is done by machines at present in use. The machine must be capable of working efficiently in the tropics.

ETCHING AND ORNAMENTING IRON.—In a permanent way by the use of chemical agents; or by the application of enamels; or by both conjointly, for the decorations of iron fire grates, fenders, gaseliers, etc.

FOR THE APPLICATION OF LITHOGRAPHY OR BLOCK PRINTING.—To stopping grounds, for etching upon glass or metals by means of chemical agents.

A VARNISH—or coating which can be applied to iron wires, so as to protect them against rust, and which shall not be liable to chip off when the wire is bent or rubbed.

A GALVANIC ELEMENT—which shall combine the constancy of the Daniell's cell with the low resistance and high electromotive force of a Grove's cell.

AN ELECTRIC CONDENSER—which shall combine high capacity with small bulk and small residual charge.

A SENSITIVE POCKET GALVANOMETER.—The size should not exceed that of a watch.

POTATO DISEASE.—For a method of preventing the potato disease.

NEW EDIBLE ROOTS.—For the discovery and successful introduction into England of any new edible root or tuber useful as food for men or cattle, capable of resisting frost, and suitable for extensive and improved cultivation.

HYDRAULIC ENGINE.—For a small, simple, cheap, and effective hydraulic engine, which, in connection with the constant water supply of towns, can be applied to work lifts in warehouses, drive lathes, the bellows of organs, etc.

UNsinkable SHIPS.—For plans for the construction of an efficient and seaworthy vessel, such that, when perforated either by shot or accident and filled with water, she shall in part maintain her floating power.

DIVING APPARATUS.—For an improved diving apparatus, in which divers may work free from the inconvenience of great pressure, and at greater depths than by means of the diving bell, helmet, or other existing appliances.

ELECTRIC WEAVING.—To the manufacturer who first practically applies electricity to the production commercially of figured fabrics in the loom.

NEW GUMS OR OILS.—For any new resin, gum, or oils, the produce of India or Africa, calculated to be useful in the arts and manufactures, and obtainable in quantity at a moderate price. Samples of not less than 25 lbs. of gum, and 50 lbs. of oil, to be transmitted to the Society.

MINES.—For the best method of applying air or water as a traction power in mines.

TELEGRAPHS.—For an economic and permanent means of telegraphing through uninsulated wires, between places not less than 1,000 miles apart.

COLONIAL SILK.—For the importation of silk cocoons, the production of any of the Australian colonies, in a dried and preserved state, in bulk, and fit for silk-reeling in England.

SURFACE BLOCKS.—For a ready means of reproducing designs by artists, as surface blocks, possessing sufficient relief to admit of their being worked at the steam press sharply and without blur.

GUNPOWDER.—For a method of constructing magazines for the storing of gunpowder, gun cotton, nitro glycerin, and other highly explosive compounds, so as to give increased security against explosions, and more effectually to provide against the possibility of large masses of material exploding, or, in case of explosion, communicating with other and adjacent quantities of explosive material.

PETROLEUM AND OTHER LIGHT OILS AND SPIRITS.—For a

cheap and effective method of constructing storehouses for the stowage of petroleum and other light oils in towns and cities, so as to give greater security to the adjacent properties.

PEAT.—For the introduction into commerce, as a substitute for coal, of fuel manufactured from peat, and suitable for combustion in domestic fireplaces, the furnaces of steam engines, and for industrial purposes generally.

Patented inventions are not excluded from receiving the Society's rewards. The Council reserve to themselves the right of withholding all or any of the above medals or premiums, as the judges may report. The Council is willing to receive communications on subjects not included in the above list. The degree of originality and value of suggested improvements will have material influence on the adjudication of the award. In all cases a full account and description of the invention for which a medal or premium is sought must be sent to the Society. All communications must be written on foolscap paper, on one side only, with an inch and a quarter margin. They must be accompanied by such drawings, models, or specimens, as may be necessary to illustrate the subject. The drawings should be on a sufficiently large scale to be seen from a distance when suspended on the walls of a meeting room.

With regard to colonial produce of all kinds, it is absolutely necessary that a certificate from the Governor, Collector of Customs, or other qualified person, should accompany the samples sent to the Society, certifying that they really are the produce of the particular district referred to. The samples should be sufficient in quantity to enable experiments to be made and an opinion to be formed of their quality and uses; and it is desirable that the cost price in the district from which they are forwarded should be given. In every instance the probable extent of supply, with the average yield, if cultivated, and whether similar articles have hitherto been exported from the colony or not, and in what quantities, should be stated.

All communications and articles intended for competition must be delivered, addressed to the secretary, at the Society's House, London, free of expense, on or before the 31st of December, 1873 or 1874. In the first case they will be considered during the session 1873-4; in the second case, during the session 1874-5.

Any communication rewarded by the Society, or any paper read at an ordinary meeting, will be considered as the property of the Society. Should the Council delay the publication beyond twelve months after the date of its being rewarded or read, the author will be permitted to take a copy of the same, and to publish it in any way he sees fit.

Zinc Bandages in Surgery.

An interesting and important experiment in surgery was performed at the Park Hospital, a few days ago, in the presence of a number of distinguished surgeons, by Dr. Fluhrer, inventor of a new bandage for fractured limbs. The contrivance consists of a number of perforated zinc strips, which, when once arranged, form an absolutely inflexible bandage, not to be disarranged by any violence or uneasiness of the patient. As soon as these cover the point of fracture, the limb is firmly set and the natural outline restored. In one of the wards of the Park Hospital is Francis Lefry, a truckman, who had a compound fracture of both thighs. No parallel case of dual fracture, it is said, is on medical record; and, as the most unpromising, the doctor selected it for a practical test. After ether had been given to the patient, Dr. Fluhrer bent over the sole of each foot a broad zinc strip in the form of a loop, the extremities of which were securely wrapped with cloth bandages previously steeped in plaster of Paris, which were prevented from slipping by the tooth-like projections of the reverse side of the punctured zinc. The terrible fracture of both thighs, when the limbs were stripped for this purpose, could be plainly perceived. To the loops were fastened stout cords, which passed over the grooves of pulleys affixed to the adjacent wall, and were drawn taut by Warden Brennan. Dr. Fluhrer next mummified the limbs with a multiplicity of bandages, over which he laid his zinc strips, and covered them with a second stratum of bandage. Immediately the lumpiness about the region of injury disappeared, and the doctor expects that, in six weeks, this bandage will be removed, and in two more Lefry will use his legs.

Two New Steamships.

Two new steamers have recently been completed at the ship yards at Wilmington, Del., belonging, respectively, to the Cromwell and Metropolitan lines, and named the Knickerbocker and General Whitney. The former vessel is of iron, of 2,000 tons register, 280 feet long, 34 feet beam, and 23 feet depth of hold, costing \$260,000. She has a vertical inverted condensing engine 44x72, and four tubular boilers. With steam up in only two of the latter, it is stated, the ship easily made a speed of 10 knots per hour. She will ply between this city and New Orleans.

The General Whitney is also of iron, and is besides a very fine model of marine architecture. Her length is 245 feet, beam 40 feet, hold 28 feet and tonnage 1,848. There are two inverted engines 36x60 and three cylinder furnaces to each boiler. The engines and boilers are carefully enclosed in iron, and the engine room is remarkably commodious and well lighted. The vessel has some novel arrangements in the shape of four independent hoisting engines, operating seven freight cranes stationed at various points. By this means the time consumed in receiving or discharging cargo will be materially reduced. The port shutters are also of new invention, and are easily worked by one man, though of exceptionally ponderous construction. The ship will be used, for freight purposes only, between this city and Boston.