

use on passenger-carrying vessels. The tests made for the government officials were very severe. The craft was first rowed up the East River for a considerable distance to try her speed, and then after this was found to be entirely satisfactory, twenty-five men were crowded onto her, and although the boat made use of on this occasion was only twenty feet long, she carried this unusual burden easily. The men were crowded to one side in an endeavor to upset her, but without success. Her cargo was then increased by the addition of 4,900 pounds of stone, which seemed to have very little perceptible effect. The compactness of this life-boat is another remarkable feature. It is said that four of them can be nested in the space which is usually occupied by one boat.

Some of the European governments, which have at hand the means of making alcohol in large quantities at small cost, have undertaken to encourage the manufacture of spirits. The Emperor of Germany, for instance, has given the matter some considerable personal attention, and has offered prizes for efficient designs of engines and lighting apparatus making use of alcohol. The result has been that great strides have been made, and the new devices are used to quite a large extent. The same thing has been done to a minor degree by the Russians, but it has been discovered to be a lamentable fact that, as the manufacture of alcohol increased, the amount consumed as a beverage also grew lamentably larger and larger. The alcohol habit has taken such a hold on the Russians, that recently the Imperial Minister of Finance offered a prize of 50,000 rubles, which is equal to \$25,750, for the discovery of some means by which the alcohol would be rendered so distasteful, that it could not be consumed in this manner. Pamphlets giving the conditions of the award have been distributed among the Russian consuls in the various countries of the world, and it is hoped to stir up a universal interest in the contest.

The Parisian scientist and inventor George F. Joubert has recently announced a discovery which will do much toward making the submarine boat a practicality. This is a means of renewing the air of the interior after the craft has gone below the surface of the water. This is done by the use of a substance called "oxylith," produced electrolytically, which has the power of giving off almost pure oxygen, when pieces of it are dropped into a quantity of water, in much the same manner as carbide of calcium acts under similar circumstances. A plant for the manufacture of the new product has been erected in the Isère district of France, where there is an abundance of water power. While there are many uses for a commodity of this character, its most promising field seems to be that referred to above, and in this connection it is said that it makes available the use of gasoline engines for propelling the boat even when entirely submerged. It is well known that gasoline offers the most economical and convenient fuel, but is only partially available for use on board these boats, because of the fumes which are given off; but with the use of "oxylith," this can be overcome, and the usual battery installation found necessary on these craft for driving while running below the surface can be dispensed with. The Joubert process has been fully described in these columns.

Quite a pretentious factory has been built at Knoxville, Tenn., for the purpose of engaging in the manufacture of several devices, which are to be made under the patents of Prof. Weston M. Fulton, of that city. Prof. Fulton is the local forecaster in charge of the United States Weather Bureau offices and observatory in that city, and by special arrangement with the government he is also instructor of meteorology at the University of Virginia. His invention referred to above has for its object the generation of power from the changes which are constantly going on in the temperature. The essential feature of his invention is the vessel holding the gases and liquids, which are acted upon by the atmosphere. He has designed a metal vessel for this purpose, with deeply corrugated sides, and he claims that this is capable of compression and expansion to a remarkable degree without impairing its usefulness. For the purpose of demonstration, the professor has one of these devices equipped for the work of raising a five-pound weight, which it does in a truly remarkable manner. It is contemplated to make these motors in connection with clocks and bread-raising machines, as soon as the factory is in running order. The clocks will never need winding, and the bread-raising machine will perform its functions in a very reliable manner and without the use of yeast. Public sentiment has of late demanded that bakers depart from the long-established custom of using yeast as a leaven for bread, and the "salt-rising" process is coming more and more into general use. This requires a higher and more uniform temperature, and artificial heat must be resorted to. It is claimed that with the regulator invented by Prof. Fulton, an absolutely even temperature may be obtained at any desired degree. The device is known as the "slyphon."

Legal Notes.

IMPLIED LICENSES AND THEIR LEGAL CONSTRUCTION.—

The National Carbon Company, a manufacturer of carbons, employed Clarence M. Barber as a mechanical engineer on a salary. It was part of Barber's duties to devote his time and skill to the improving and cheapening of the process of manufacturing carbon, an essential step of which process was electroplating. While he was thus employed, Barber invented a valuable method for electroplating, and a machine for carrying out this method. He took out patents for both his method and his machine. Under his supervision, special buildings were erected at the works of the National Carbon Company, his employers, to accommodate seven of his machines, six of which were built and installed under his direction, and the seventh of which was installed after his employment had ended.

These were the facts in the case of Barber vs. the National Carbon Company (129 Fed. Rep. 370). The question presented to the Court was this: Had the National Carbon Company any right to use the seven machines which had been installed, and the patented process invented by Barber?

The precise terms of Barber's employment were somewhat indefinite. That his employers knew of his purpose to apply for a patent was most likely. Buildings were especially designed for the use of Barber's process, and apparatus was constructed under his direction, which the court thought were facts sufficient to raise the presumption that he intended to grant to the Carbon Company the right to use his process in connection with the machines, for which space in the several factories had been specially arranged with his knowledge and under his direction. The right of use presumed was the right to use such number of machines as had been prepared for, a right not limited to the life of the particular machine, but including renewals so long as the Carbon Company continued in the manufacture of carbons. The court therefore held that the scope of the implied license included the seventh machine, constructed after Barber was discharged, to occupy the place prepared for it under Barber's direction. His conduct was such in the court's opinion, that Barber had estopped himself from asserting that the use of his invention to this extent was an infringement of his right as a patentee.

ADDITIONS, OMISSIONS AND CHANGES—WHEN THEY CONSTITUTE INFRINGEMENT AND WHEN THEY DO NOT.—

John Lenhart secured a patent in 1889, covering an adjustable sliding plate attached by means of a bolt and a slot in the plate, to the inner side of the mold board or share of a plow, to regulate its tilting. The plate described in the specification has a thin lower edge turned toward the share, so that, as it is depressed, it will pass under the edge of the share and cut the roots of grass under the turf. This patent, in an infringement suit brought by Lenhart against the Laurie Implement Company, was held to be infringed by defendant's device, and that decree was affirmed by the Circuit Court of Appeals (130 Fed. Rep. 122).

On appeal, the court held that defendant's device, which consisted of an adjustable sliding plate attached by means of a bolt and a slot in the plate to the inner side of a clip on the inner side of the mold board of a plow, to regulate its tilting, is the mechanical equivalent of Lenhart's device, although its lower edge is flattened in the form of a triangular shoe, so that it will not cut roots, and although it depends by the side of and not vertically under the edge of the plowshare.

This decision exemplifies the well-known principle of patent law, that infringement cannot be escaped by adding to or subtracting from a patented device, by changing its form, or by making it more or less efficient while still retaining its principle and mode of operation, and while attaining the same result by the use of identical or of equivalent mechanical means.

ASSIGNERS AS NECESSARY PARTIES TO AN INFRINGEMENT SUIT.—

The McMichael and Wilman Manufacturing Company brought a suit against Ruth, alleging infringement of letters patent granted to Abner McMichael and Frank B. Wilman for automatic rib knitting machines. Among other things, the answer alleged that the plaintiff was not the owner of the entire patent, but that a third interest was owned by Lewis Jones. An instrument was offered in evidence signed by McMichael and Wilman in which they agreed, in consideration of Jones' having improved upon an invention of theirs, to transfer to him a third interest of all the improvements patented thereon, and also to transfer to him a third of any patents which might be issued to McMichael and Wilman in the future, provided that they had been developed at the expense of Lewis Jones. It will be noted that the instrument was wholly executory, that it was not an immediate as-

signment, but an agreement to transfer. Obviously, the instrument did not convey the legal title to a third of any existing patent. For that reason the court held that the plaintiff could not be required to litigate the question of establishing Jones' interest in this particular patent.

Attacking the question of infringement, the court was not convinced that the presumption of validity which arises from the granting of the patent was rebutted in this case. The defendant contended that the substitution made by the patentees did not require invention. It was a mere exercise of selection wholly within the domain of mechanical skill. If it were true that what was done by McMichael and Wilman did not require invention, but only the exercise of mechanical skill, the conclusion which the defendants sought to deduce from this proposition would, of course, be inevitable. But the court thought the creative faculty of the inventor, not merely the ingenuity of the skilled mechanic, was exercised in producing the patented combination, which was a knitting machine. The art had been already developed; the patentees brought to it nothing of a fundamental character. Nevertheless, in the court's opinion they did, by their improvements, create a construction which had never before existed and which has proved to be commercially successful.

The decree of the Circuit Court was placed wholly on its finding that the defendants had not infringed. But in that view the Circuit Court of Appeals did not concur. The latter court thought that the court below was not warranted in limiting the construction of the claims as it did.

A STRANGE ASSIGNMENT CASE.—

The two suits brought by the National Cash Register Company against the New Columbus Watch Company and the Hallwood Cash Register Company, recently decided in a single opinion by the Circuit Court of Appeals (129 Fed. Rep. 114) are curious in more than one respect. It seems that the complainant purchased and took an assignment of an application for a patent which had been pending in the Patent Office for some four years. Six months before the filing of the application complainant had been in negotiation with the applicant and two other persons for the purchase of prior patents for inventions made by him relating to the same kind of machines, and issued to the three. He was then informed of an agreement between them by which, so long as it continued in force, the other two persons furnished the capital necessary to perfect and patent all inventions made by the inventor relating to the subject-matter and were to have an equal interest in the patents as a consideration. As a matter of fact the application bought by complainant covered an invention made under such agreement, and two persons who furnished the capital were each equal owners of a third interest. The Circuit Court of Appeals decided that the facts were such as to put the complainant on his guard and to charge him with notice of all that might have been learned by an inquiry prosecuted with reasonable diligence, and that no title was acquired to the patent subsequently issued which would support a suit for its infringement.

THE POWERS OF OWNERS OF UNDIVIDED INTERESTS IN PATENTS.—

The owner of an undivided part of all the rights secured by a patent may without the consent of his co-owners grant a valid license to use the monopoly secured by a patent. A patent secures the exclusive right to use, and the exclusive right to sell the invention it protects. A grant of all these exclusive rights throughout the United States, a grant of an undivided part of all these exclusive rights, or a grant of all these exclusive rights throughout a specified part of the United States, is an assignment of an interest in the patent, by whatever name it is designated. A grant of any interest in or right under a patent less than these is a license.

Such is the monopoly granted by letters patent, that an exclusive licensee for the sale of articles embodying a patented invention or discovery may attach all such conditions as he sees fit to it unless made under his license. A contract may be made, binding a purchaser not to sell for less than a certain named price, nor to any other dealer who does not sign a similar agreement, and making a compliance with such requirements a condition of the license to use or lend the patented article.

The fact that an alleged infringing mechanical device lacks one of the functions of a patented device does not avoid infringement, where such function is not claimed in the patent.

It is a well-known principle in Federal Court procedure that the owner of a patent is not estopped to maintain a suit against the user of an article held to infringe by the Circuit Court of Appeals because of a contrary decision in another circuit in a suit against the manufacturer.—*Eldred v. Breitwieser* (C. C.), 251.

RECENTLY PATENTED INVENTIONS.

Electrical Devices.

ELECTRIC HEATER.—E. P. WEGGEN, Jefferson City, Mo. The invention relates to electric heaters admitting of general use, but more particularly to a type of heater used to a great extent in the boot, shoe, and leather working trades. It is especially valuable for heating burnishing-irons for ironing the bottoms of soles of shoes and boots and for treeing-irons used for ironing the uppers of boots and shoes.

MOVABLE INCANDESCENT LAMP OR GAS-LIGHT HOLDER.—J. H. STANTON, St. Catharines, Canada. Mr. Stanton's invention is an improvement in that class of hangers or holders for lamps which are suspended and adapted to swing or be adjusted in different positions or at different angles. The hanger is adapted for holding a gas-tip at any required angle or position with the same facility as an incandescent lamp.

Of Interest to Farmers.

FRUIT-GATHERER.—J. R. REID, Vancouver, Wash. With some classes of fruit it is expedient to shake the same from the trees; but the fruit falling on muddy or similar ground is objectionable, because of the washing and cleaning that must follow. The object is to here provide an inexpensive device adapted to be arranged around a tree below the branches and into which fruit may fall and from which discharged into a suitable receptacle. The device may be easily removed from tree to tree, orchard to orchard, and compactly folded when not in use.

FENCE.—H. M. MEINECKE, Tomah, Wis. The invention comprises the combination of a post threaded at its lower end, and a base-plate having an opening for the post and provided at its edges with the laterally-extending spur-like arms projecting downwardly at their outer ends and forming extensions laterally beyond the edges of and below the base-plate. The post can be used in any kind of soil and sunk to any depth to prevent leaning and loosening, and used at corners or at intermediate points.

Of General Interest.

MANUFACTURE OF BISCUIT CUPS.—A. JEDKA, New York, N. Y. The invention refers to cups to be filled with ice-cream, candies, etc., and its object is to provide certain improvements in the manufacture of cups whereby a uniform baking of the biscuit dough in the baking-iron is obtained, a large number of cups are simultaneously and uniformly baked at each operation, and operator enabled to quickly manipulate the baking-iron.

LATCH.—C. H. BLANDING, Harvey, N. D. In the present patent the object of the invention is the provision of an improved substitute for ordinary door-latches which shall be simpler, cheaper, stronger and more durable. The latch or latch-bar is constructed of wire bent upon itself and twisted. All parts of the improved door-latch are constructed of wire, so that the device excels in the qualities mentioned above.

AIR-SHIP.—T. C. BENBOW, Absarokee, Mont. Mr. Benbow's invention is an improvement in air-ships, and especially in that class which employ gas-bags forming supports for the car, and the invention relates particularly to means for propelling the car in either direction, for causing the same to descend, and for aiding in the ascent of the ship.

FABRIC TRIMMING.—B. BRANNER, New York, N. Y. The object of the invention is to provide an improved fabric trimming adapted to be converted or made up into different articles—such, for instance, as a lady's collar or other neckwear, a bow, rosette, or the like—used on hats, dresses, and other wearing apparel.

CORSET.—E. SAVOYE, 35 Rue du Caire, Paris, France. In this invention, the main feature of the corset resides in the vertical whalebones, the lower ends of which lie at a certain distance above the lower edge of the corset, and the upper ends lie under the upper edge of the corset and fastening ribbons or similar devices arranged circumferentially on the upper part of the corset. This corset sustains the body, is very comfortable, and the whalebones are arranged to be less liable to break, especially when what are called "spring-steel" whalebones are used.

BILL-FILE.—J. P. WOMBLE, Newport News, Va. The invention is an improvement in that class of files which comprise a pointed pin, a supporting-base therefor, and a tube adapted to slide on the pin and extending the whole length of the same and serving to receive and hold bills and other papers which are removed with it when it is desired to examine them for the purpose of detaching one or more.

GARMENT-FORM.—G. WEANT, Mannington, W. Va. The object in this improvement is to provide an inexpensive form through the agency of which a perfect form or model of a person can be produced to serve as a lay-figure on which dresses or other garments may be fitted, and insuring a perfect fit for the person from whom the form was made, thus relieving the person of much annoyance and loss of time in submitting to the usual methods of dress-fitting.

FIRE-ESCAPE.—J. WENIG, Mount Pleasant, Mich. In this instance the inventor's object is the provision of a novel construction where-

by the chute may be raised to a window and may be connected therewith in such manner as to afford a means for the safe escape of the occupants of the house. The chute may be of canvas or other suitable material, and has at its upper end a frame by which it may be held open, and handles at its lower end, by which firemen on the ground can hold it in any desired position.

GAS-CHECK.—A. ULLMANN, Macon, Ga.—Mr. Ullmann's improvement is in that class of checks in which a pin-valve is employed for regulating the flow of gas. His check obviates well known objections. By employing a plurality of small openings he is able to secure a high pressure of gas and greater velocity of the same, and by using a pin-valve for each port or exit the latter never becomes clogged. The check is practically self-cleaning and never requires attention after installation.

TOBACCO-POUCH.—O. VAN COLE, Cripple Creek, Col. Users of tobacco in plug form generally experience inconvenience and loss of time in reaching a knife for cutting tobacco from a plug, and this frequently leads to the practice of persons biting parts of the tobacco from the plug. The object of the inventor is to overcome this disadvantage and to provide means which will enable parts of the plug to be readily and quickly cut and also tend to reduce the evils of biting off parts of the plug.

PROPELLER.—T. G. THOMPSON, Cambridge, Wis. The inventor seeks to provide a construction which in its operation will simulate closely the movements of a fish in propelling in water, and to this end he makes provision for what he calls the "main" arm, with the outer swinging end of which is connected to the blade, so the latter can be swung bodily by the movements of the main arm on its center and also can swing on its pivotal connection with the arm in such manner as to secure a double action in the propeller, resulting from the movements of the arm with the blade and from movements of the blade to a limited extent independently of the arm.

FINGER-RING.—C. SCHMIDT, New York, N. Y. This invention has for its object the provision of a finger-ring resembling an ordinary signet ring and arranged to provide a locket containing pictures and the like. Pictures, etc., can be readily viewed when swinging the segmental cover into an open position. The cover is not limited to a flat seal portion, and may be arranged exteriorly and of different forms, and ornamented with precious stones and the like.

JEWEL-PIN SETTER.—O. E. SCOTT, Waterbury, Vt. In this case the object is to provide a setter arranged to insure an accurate setting of the ruby-pin without removal of the roller-table or hair-spring from the balance-wheel to prevent the rim of the wheel from being subjected to heat, and hence injured by the heat employed in melting the shellac used for fastening the ruby-pin in position in the table.

PROCESS OF MAKING HOMOLOGUES OF IONONE.—R. SCHMIDT, Holzminden, Germany. This application is a division of a prior United States application, filed by Mr. Schmidt. The inventor obtains the pure isomerides, the kind of isomeride obtained depending upon the nature of the acid, those acids which, like concentrated sulfuric acid, exhibit very marked hydrolytic action producing isomerides of the beta series, while the actions of acids such as phosphoric, formic, and the like, the hydrolytic action of which is inferior to that of sulfuric, will not go beyond formation of isomerides of the alpha series. The invention relates to manufacture of alpha and beta ionone.

BEVERAGE.—E. M. ROBERTS, Atlanta, Ga. The more particular object in this instance is to produce a beverage which simulates the bitter and pungent taste generally found in lagers-beers, ales, etc., containing little or no ferment or fermentative product and made without the direct use of alcohol, malt, or hops. It may be dispensed after the manner of soda-water and to some extent used as a medicine.

PASTEURIZING BOTTLED LIQUIDS.—O. MATHIE, Wausau, Wis. The inventor provides an apparatus for use in sterilizing bottled liquids, especially beer. In the sterilizing process many bottles burst, entailing more or less loss. Further, in the sterilizing process beer is often so changed as to have a burned or other disagreeable taste, and also objectionable color. By Mr. Mathie's improvement both the above indicated results are avoided with certainty, so that great economy is effected and an improved product obtained.

ADJUSTABLE PIPE-HANGER.—O. C. MEYER, New York, N. Y. The purpose of the improvement is to provide a hanger in which lightness is combined with strength and by means of which pipes may be arranged in series one over or under the other and be placed in parallelism or at angles with each other to each other vertically or horizontally. The hanger is constructed so that it is flexible in its clamping action.

ARTIFICIAL FUEL.—G. K. HOLLISTER, JR., New York, N. Y. The inventor's process is a simple process free from all those materials that go to make an artificial fuel so costly, thereby placing such processes beyond actual operation, and from demonstrations already given it has been proven that briquets made by his process are as good as the real article. Therefore it is possible by the Hollister process

to utilize a large amount of coal waste or screenings and the like, that has always been an undesirable fuel.

HANDLE ATTACHMENT.—W. CHAMBERS, Chicago, Ill. The invention refers to improvements for attaching handles to pots, kettles, and utensils of various kinds. It is especially adapted for use on receptacles which have to be heated and which have a pivoted bail or handle that hangs down in contact with the receptacle while it is being heated. The bail or handle quickly becomes heated when in such a position; and the object is to remedy this undesirable state of affairs.

Hardware.

FOOT-VISE FOR ANVILS.—E. M. CORNELL, Centerburg, Ohio. The objects of the invention are to secure an arrangement of an anvil with a vise attached, which shall be for general use and of special value in horseshoe-work, such as welding sharp toe-calks. To so construct the vise that it may be very easily and quickly brought into position for use with the anvil and may be swung out of the way when not in use to permit other work to be done on the anvil. To provide a holding device normally open, so that it is always ready for use without first making a superfluous motion to open the jaws.

FLUE-EXPANDER.—J. A. PLAYER, Southern Marine Works, New Orleans, La. Mr. Player's invention relates to improvements in tools for expanding boiler-flues in flue-sheets, the object being to provide a tool adapted to be operated by a suitable motor and by means of which a flue may be quickly expanded to a tight fit in the flue-sheet opening and parallel with wall of the opening.

RIVET.—G. L. MILLER, Socialville, Ohio. The invention may be used in every connection to which the ordinary tubular rivet is applied, such as harness, trunk, and certain kinds of shoe work, and upon heavy cloth goods, and the like. It has a smooth head at each side, and is therefore without rough edge to catch or scratch material, the clenches not coming in contact with adjacent surfaces. There is, moreover, no irregular portion for dirt or the like to collect about.

SASH-FASTENER.—J. H. CLEMENTS, Coparas Cove, Texas. In this case the improvement relates to sash-fasteners or supports, and is applicable to sashes which are not counter-weighted. It contemplates the use of a vertically-disposed rod which is attached to a window-casement, and in connection with this rod a clutch is employed which is attached to the sash. The invention resides especially in the construction of the clutch and improvements in the means for attaching the clutch to the sash.

Machines and Mechanical Devices.

DIE-STOCK.—J. J. DELEHANT, Chicago, Ill. Mr. Delehan's invention relates to improvements in stocks for thread-cutting dies, an object being to provide a die-stock with a simple means for quickly adjusting it to different sizes of pipes or rods on which a thread is to be cut and serving as a guide to cause a perfectly straight cut of thread.

CONDUIT-THREADING MACHINE.—E. U. MACK, Florence, S. C. In this patent the invention has reference to machines for traversing conduits to effect the drawing in of an electric or other conductor or a cord for attachment to such conductor. The inventor's principal objects are to provide an effective apparatus of this class which will act automatically.

VISE.—E. CLARK, Dover, Del. In the present patent the intention of the invention is the provision of a new and improved vise arranged to permit the operator to conveniently and quickly open and close the jaws to firmly grip or release the article while it is undergoing the desired treatment.

GRINDING-MACHINE.—D. S. THOMPSON, Livermore Falls, Maine. The object is to provide a machine more especially designed for the use of manufacturing opticians to permit of grinding cylindrical, toric, and other lenses with the greatest accuracy and producing exceedingly fine surfaces without requiring skilled labor and without giving much attention to machine during the grinding process. The invention relates to grinding-machines such as shown and described in the Letters Patent of the United States formerly granted to Mr. Thompson.

BOOK-FINISHING MACHINE.—F. A. STEELE and M. KALABA, New Rochelle, N. Y. In this patent of the Messrs. Steele and Kalaba the invention has reference to a machine for marking the backs of books with gilt and various other inscriptions, whereby the marking or finishing is performed with mechanical accuracy and much more rapidly than could be done by hand.

SAWING-MACHINE.—J. R. REID, Vancouver, Wash. The invention has particular application to improvements in a motor-driven drag-saw mechanism. An object is to provide a machine that may be easily carried or transported from place to place over rough and uneven ground, such as found in wooded localities, without the necessity of using teams or consuming time in clearing a path for passage of the machine through the woods. Further, to provide a novel machine, the saw whereof is

designed to be driven by a suitable engine or motor mounted upon the frame.

PACKAGING-MACHINE.—A. McLEOD, and J. H. McLEOD, Marietta, O. In this patent the inventors have made certain improvements in packaging-machines, and especially in force-feed devices for flaked or powdered material. The present invention is especially adapted in handling flaked goods, such as rolled oats, for which work the machine has proved very satisfactory.

WINDMILL-PUMP COUPLING.—C. W. DECKER, Charles City, Iowa. The object here is to provide means of coupling the hand-lever of the pump to the pump-rod, at the same time uncoupling the windmill-rod from the pump-rod and vice versa. Means for obtaining this are embodied in a device attached to a special form of windmill-rod, all apparatus for coupling and uncoupling being contained in this pump-rod with its attachments. The device is practical and extremely convenient in that the pump-rod may be placed in the pump, replacing the original pump-rod, and after attaching the device by certain means the apparatus is ready to be used.

LEADING ATTACHMENT FOR TYPE CASTING AND SETTING MACHINES.—S. DRUMMOND and W. C. LIEBERNECHT, New York, N. Y. The invention refers to improvements in leading attachments for type casting and setting machines, and particularly to the so-called "monotype machine," the object being to provide a device by means of which leads of any desired size will be automatically fed between the lines of type as composed, thus not only expediting the setting up of matter, but resulting in a uniformity of work.

MACHINE FOR MAKING TUNE-SHEETS OF MUSIC.—N. COLLINS, 22 Grays Inn road, London, England. As usual with tune-sheets, notes are represented by perforations in the sheet, there being a line of perforations corresponding to the notes of each pitch in the scale, the length of the several perforations and of the intervals separating them representing the length of the respective notes and intervals in the piece of music to be reproduced. The invention relates to improvements in machines for making "note" or "tune" sheets which are used in connection with automatically-played instruments.

STREET-SWEEPER.—A. BROWN, Plainfield, Ill. Mr. Brown's invention relates to sweepers of that class which take up and collect dirt gathered from the street and retain it in dirt receptacles which are removable from the sweeper and designed to be loaded onto a separate vehicle to be carried away to the dump, so that the sweeper itself may be kept continuously at work. A former patent granted this inventor is a sweeper of this type, and the present comprehends features by which the machine sweeps cleaner, operates closer to curb, and is rendered more compact and stronger.

BLUE-PRINT MACHINE.—H. A. BUCHHOLZ and E. J. G. RADENMACHER, New York, N. Y. The purpose here is to provide a form of machine especially adapted for making blue prints or photographic prints from tracings on transparent material or drawing-paper adapted for the purpose, and to so construct the machine that properly-prepared paper in reel form is protected from light and held in revoluble manner in machine in suitable receptacle and means for feeding the prepared paper in connection with the tracing-cloth or other material from which a print is to be made beneath a transparent pane which will uniformly hold the sensitive paper and cloth containing designs to be copied in smooth, close relation to each other.

Prime Movers and Their Accessories.

ROTARY ENGINE.—W. BEAUMONT, Granite, Oklahoma. Mr. Beaumont's invention refers to improvements in rotary engines, an object being to provide an engine of this type so constructed as to be evenly balanced while running and which may be operated with an economical use of steam. The body of the engine is cast in four parts, suitably bolted together, and is therefore comparatively cheap to manufacture and assemble and is easily traced or turned up.

CONTROLLING AND GOVERNING GEAR FOR PRESSURE-ENGINES.—E. CROWE, Birchholm, Bushey Wood, Tolly Rise, Sheffield, England. Mr. Crowe's invention relates to the controlling (including the starting, stopping, and governing) of steam and other pressure engines, and has the twofold object of reducing to a minimum the manual labor required to adjust the controlling device and of automatically regulating during the running of the engine the supply of steam or other motive fluid according to the amount of load for the time being on the engine.

EXPLOSIVE-ENGINE.—R. MILLER, New York, N. Y. In this case the invention relates to an engine of simple construction and great thermodynamic efficiency. This efficiency is obtained by an initial pressure of high intensity, due to thorough scavenging and to a complete expansion and utilization of the explosive charge.

RELIEF-VALVE FOR LOCOMOTIVE-CYLINDERS.—F. L. ROBINSON, Cheyenne, Wyo. The improvement made by this inventor has reference to relief-valves, and more particularly to a type of such valve suitable for use upon locomotives to enable the engineer to vent cyl