

practically and essentially admitted by the Secretary for War.

**RELIEF FOR THE PATENT OFFICE.**

The "Act for Revising and Perfecting the Classification of Letters Patent and Printed Publications of the Patent Office," as passed by the Senate a few weeks since, was, on June 6, concurred in by the House by a vote of 153 to 58, and has been signed by the President. The complete text of the bill is as follows:

Be it enacted, etc., That for the purpose of determining with more readiness and accuracy the novelty of inventions for which application for letters patent are or may be filed in the United States Patent Office, and to prevent the issuance of letters patent of the United States for inventions which are not new, the Commissioner of Patents is hereby authorized and directed to revise and perfect the classification, by subjects-matter, of all letters patent and printed publications in the United States Patent Office which constitute the field of search in the examination as to the novelty of invention for which applications for patents are or may be filed.

SEC. 2. That for the purpose of enabling the Commissioner of Patents to carry out the provisions of this act the Secretary of the Interior is hereby authorized to appoint from time to time, in the manner already provided for by law, such additional number of principal examiners, assistant examiners, first-class clerks, copyists, laborers, assistant messengers, and messenger boys as he may deem necessary: Provided, however, That the whole number of additional employes shall not exceed 3 principal examiners, 2 first assistant examiners, 2 second assistant examiners, 6 third assistant examiners, 5 fourth assistant examiners, 4 first-class clerks, 4 copyists, 6 laborers, 6 assistant messengers, and 6 messenger boys; that the annual expenses for this additional force shall not exceed the sum of \$62,800.

Notoriously, for many years, the delays incident to securing letters patent have been both wearying and vexatious, to say nothing of the jeopardizing of many interests essential and financial. Eighteen months, even two years, have in some instances been consumed ere the desired papers, and the protection they are supposed to afford, could be secured, and that, too, in the face of the fact that Patent Office employes have long been worked harder, and worked more overtime, than those in any other department of the United States government, and, moreover, have annually turned into the Treasury more money representing actual net profits. Such a deplorable condition of affairs is no reflection upon the conduct of the Patent Office or its Commissioner, but is due to the lack of interest in the matter taken by the members of Congress in the past, and a failure to fully appreciate the great necessity for maintaining the work of the Patent Office at the highest possible standard. As a result, the work of the Patent Office for more than a decade has been going behind in consequence of the increasing business; and the complaints regarding delays—absolutely inevitable under the conditions existing—hourly grew in number and in insistence.

Inasmuch as the Patent Office is more than self supporting—its net profits in 1897 being fully \$252,000—coupled with the fact that it already has lying idle in the Treasury more than \$5,000,000 that by enactment are utterly unavailable for any purposes whatsoever except those of this office, it seems surprising that any combination should be formed among legislators for the purpose of rendering this surplus useless. It must be remembered all receipts of this department are at once turned into the United States Treasury and that the current expenses are obliged to be provided for from the same, by legislative appropriation.

When the Act came before the Lower House on its final passage, the animus of certain members was actively displayed, and objections of the most petty and trivial character formulated. Among the most persistent opponents was Mr. Dockery, of Missouri, who willfully and wantonly ignored all evidence and facts, and emotionally appealed to the House not to increase the burdens of the people of the United States by class legislation at a time when the general tax rate is required to be advanced in order to carry on a war with Spain; and though while on the floor he was repeatedly corrected and shown that the fund from which the appropriation must come was the property of the inventors of the country and should not be diverted to other uses, the gentleman insisted upon declaiming regarding a hypothetical outrage about to be perpetrated on the tax-paying community at large. Neither argument, reason nor fact could stay the current of this sophistical tirade, and to the last, the representative from Missouri assumed that his position was dictated by economy and the interests of the country in general.

By the courage and insistence of the Commissioner and the friends of the Patent Office in the Senate and House, a victory has been won that is not only commendable per se, but that will prove of far-reaching benefit. The Commissioner expects that all arrearages will be disposed of by January next; also, that a newer, better and more direct and comprehensive system of examination and classification will speedily be inaugurated, whereby definite decisions and comparisons can be given that will relieve the patentee of the burden, so frequently necessitated, of appeal to the courts to establish the rights and status of an invention.

It is greatly to be hoped that the new order of affairs, once entered upon, will be permitted to exist, and that the Patent Office will no longer be hampered by capricious and trivial legislation; that, in fact, a strictly

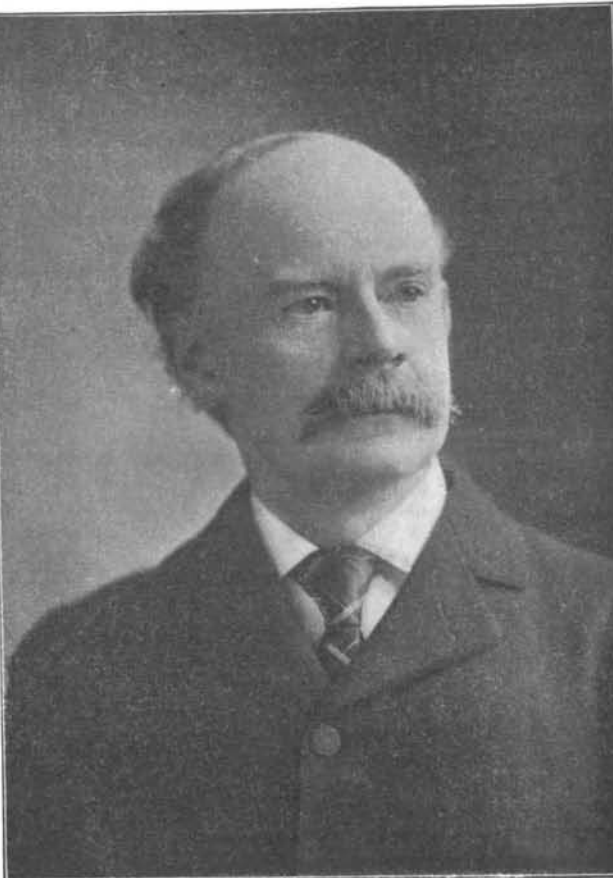
businesslike and profitable department will be permitted to conduct its affairs along strict business lines. When Mr. Duell took charge of the office, in February last, there were nearly 10,000 new and nearly 4,000 amended applications awaiting its consideration. The new work on applications dated back to July, 1897, and amended applications back to September, 1897. The Commissioner early directed that the old work be brought and kept up to within fifteen days, and whenever necessary the force was required to remain until five o'clock to accomplish this result. By this means the office has made a gain of 1,200 cases in amended work, but the Commissioner expresses himself as opposed to this unjust although necessary discrimination against his force, which he claims is a force unequalled by that of any other bureau.

We desire that our readers shall understand that persistent efforts have been made by the Commissioner in his desire to advance the interest of the bill. We congratulate him on the success attained, and Congress upon recognizing the urgent needs of the inventors and patentees of the country.

No greater evidence could be advanced of the intelligence and liberal spirit of the present Congress than the attitude it has taken in passing this bill by such a large majority. It is welcome to all classes in the community to feel that the manufacturing and industrial interests of the country as protected by our patent system is being fully upheld.

**STREET CLEANING IN EUROPEAN AND AMERICAN CITIES.**

After an extended personal examination of the street



LATEST PHOTOGRAPH OF COMMISSIONER OF PATENTS CHARLES H. DUELL.

cleaning methods in vogue in the principal Continental cities—London, Birmingham, Brussels, Paris, Berlin, Cologne, Munich, Turin, Genoa, Vienna and Budapest—Ex-Commissioner George E. Waring, Jr., embodies his observations in a detailed report to the mayor of the city of New York. Though many novel features were noted, little was discovered that offered improved effectiveness or facilities over methods now in vogue in one or two cities on this side of the Atlantic, and in many instances the procedures are much more crude and clumsy. In the matter of street sprinkling, however, most foreign cities are superior to our own, in that it is not done by contract, or farmed out, but undertaken exclusively by the municipality; hence all streets and portions of streets are sprinkled uniformly; and, as regards asphalt pavements at least, water is not allowed to stand or accumulate, but the surface is frequently "squeegeed" or dried by means of a rubber scraper.

The most important and suggestive consideration offered by Mr. Waring is that which concerns the relation of the people to the work, and largely, as leading to that, the manner in which the police intervenes to prevent the littering of streets. While the municipal ordinances relating to such are nowhere better than those of New York and other American cities, the vital differences lie in the enforcement thereof.

In Europe all ordinances are enacted with the view of being strictly enforced; in the United States generally, many ordinances merely serve to encumber the statute books, being treated as matters of form unworthy of further consideration, once they have been duly engrossed. Abroad the "guardian of the peace" would no more think of disregarding an act that would

lead to littering the street, or the accumulation of filth therein, than he would of disregarding the operations of burglars or highwaymen. In cisatlantic cities, the policeman dignifiedly saunters by a crowd busily engaged in littering the street, utterly unconscious, seemingly, that an ordinance is being violated; but on the Continent such act, if by a resident, entails prompt arrest followed by a fine; if by a stranger, he is first required to remove the cause of his offending and is then cautioned against repetition; even if but a tiny scrap of paper has been thrown down, it must be at once recovered, or the full penalty will be exacted. One notable feature observable in Continental cities is that no one expectorates on the footwalks, but when such act is rendered necessary, it is the carriageway or gutter that suffers; and an ordinance to this effect, if enforced, would go a long way toward making the footwalks of American cities more suitable to lady pedestrians.

In Austria and Austria-Hungary were found the best street sprinklers, best snow plows, and best street sweeping machines. The two latter were particularly effective, being specially adapted to the work required; each of the former is followed by an individual who carries the sprinkler from side to side as needed, insuring even distribution of the water on all portions of the pavement.

In the matter of disposal of sweepings and garbage, most Continental cities are sadly hampered. In some the refuse is carried far beyond the limits of the municipality by specially provided railway trains, to be dumped in some arid or unobtrusive locality, there to be systematically sorted, a part, perhaps, being utilized as filling for low and marshy areas. The sorting is chiefly performed by women and children, who receive only a mere pittance at most. Some English boroughs have adopted cremation, and however ideal the process may seem, it is not without unpleasant features; aside from odors, the fine dust and ashes that result upon combustion escape from the chimneys of the retorts, are carried to considerable distances, and create a constant annoyance and cause of complaint on the part of residents of the neighborhood; the higher the chimney, the greater the area thus affected. Manifestly, cremation of garbage will not increase in public favor, and it has already been practically abandoned in several American cities where it has been attempted. In Detroit, Michigan, especially, it has entailed a series of lawsuits against the municipality.

The principal thoroughfares in London are kept as nearly clean and immaculate as it is possible for them to be made by human device and ingenuity. Boys with brushes and exaggerated iron "dust-pans" are constantly on the alert, and anything and everything is swept up almost as soon as it touches the pavement, to be deposited in close boxes placed at regular intervals along the curbs; and these boxes in turn are replaced by others several times daily, the filled receptacles being carried away by relays of carters.

Ignoring the difference in wages paid to street cleaning employes, the expense entailed in keeping cities clean is not less, and oftentimes considerably greater, abroad than in the United States, accepting New York as a type of the latter; and even when the matter of wages is also computed, the advanced expense here entailed is trifling by comparison.

The ease with which dust, ashes, paper, droppings of cattle and other garbage is disposed of, coupled with the monetary returns accruing to sortage and sales, are no inconsiderable factors in reducing the expenses of street cleaning in New York; the advantages of this city in these directions are practically without a parallel on either hemisphere. But road-making, paving, and especially the preparing of road-beds prior to surfacing, is, as a rule, considerably further advanced in Europe than in the United States. Asphaltum pavements are uniformly better; but those surfaced with wood are decidedly worse, though better cared for. Macadamizing is in its infancy in this country, and there is much to be learned as regards the preparing of the road-bed prior to surfacing. Stone pavements abroad are much more carefully and thoroughly laid, and the blocks better prepared, being nearly as uniform in size and surfaces as pressed bricks, thereby avoiding unsightly joints which serve to accumulate filth.

The final conclusions of Ex-Commissioner Waring are, that while cisatlantic cities, including New York, afford material opportunities for improvement in street cleaning and road-making, they have little to learn as regards the former from the methods that obtain in Europe.

A UNIQUE feature of nearly all homes and offices in Manila is the use of tiny square panes of translucent oyster shells instead of glass. The windows measure on the average six feet long and four feet wide and contain 260 of these oyster shell panes, which temper the fierce glare of the sun in the building. In a country where many people go blind from the constant sunshine this is a precaution very necessary to be taken.

**A Decision in the Sprague Motor Case.**

After having been considered and passed upon by nearly every United States judge in this district, including those comprising the United States Circuit Court of Appeals, the suit of the Sprague Electric Railway and Motor Company against the Union Railroad Company and the Walker Company would appear to have at last been finally settled by a decree rendered by United States Judge Wheeler, in which the Court of Appeals concurs, unless the defendants decide to carry the litigation to the United States Supreme Court.

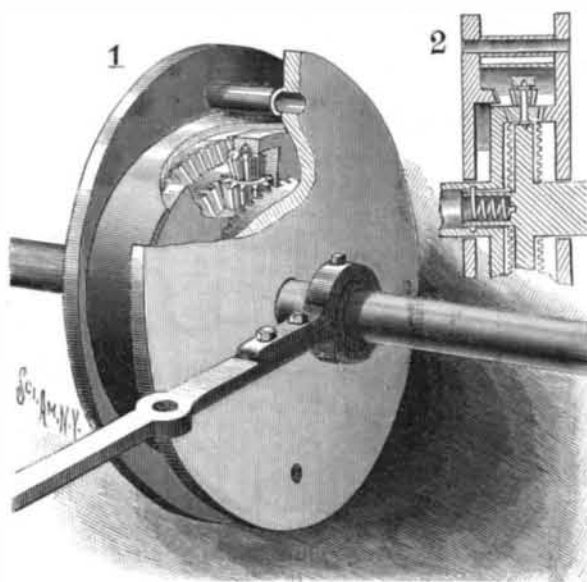
Judge Wheeler decides that the plaintiff is the owner of the patent for an electric railway motor, the original inventor of which was Frank J. Sprague, and orders that the defendants be perpetually enjoined from making, using or selling the device. His Honor also directs that the defendants pay to the plaintiff all profits which they may have derived from the infringement and use of the Sprague patent. Commissioner Shields is designated as master to take an account of such profits and to report to the court.

This decision involves many thousands of dollars and the payment of royalties to the Electric Railway and Motor Company by railway companies throughout the country that are using the Sprague trolley device.

**AN IMPROVED DIFFERENTIAL GEARING.**

The gearing represented in the engraving comprises two shafts rotating independently of each other and yieldingly connected by a coiled spring held in the reduced hollow end of one of the shafts. The shaft carrying the coiled spring is provided with a disk upon which axes are mounted carrying pinions. Upon the other shaft a gear-wheel is mounted. Of the pinions carried by the disk, the lower ones are always in mesh with the gear-wheel on the shaft, but may be moved in or out of engagement with a fixed gear-wheel held in the frame of the apparatus opposite to the shaft gear-wheel. The other or upper pinions can be made to engage a larger gear-wheel also fixed to the frame, but arranged on the same side as the gear-wheel mounted on the shaft. The two fixed gear-wheels are adapted to engage the pinions alternately.

Upon rotating the gear-wheel shaft, the pinions are made to revolve. When the lower pinions are in mesh with the smaller fixed gear-wheel, as shown in the sec-



**FYFE'S DIFFERENTIAL GEARING.**

tion, they roll off on this fixed gear-wheel, and, therefore, the disk carrying the pinions is made to revolve on the shaft on which it is formed. When, by shifting the disk shaft, the upper pinions are made to mesh with the larger fixed gear-wheel, then an opposite motion and different speed are imparted to the disk shaft, as the upper pinions roll off on the larger fixed gear-wheel. If, on the contrary, the disk shaft be rotated, then the disk carries its pinions around and they then roll off on either of the fixed gear-wheels and, consequently, cause the shaft gear-wheel to rotate the shaft upon which it is mounted.

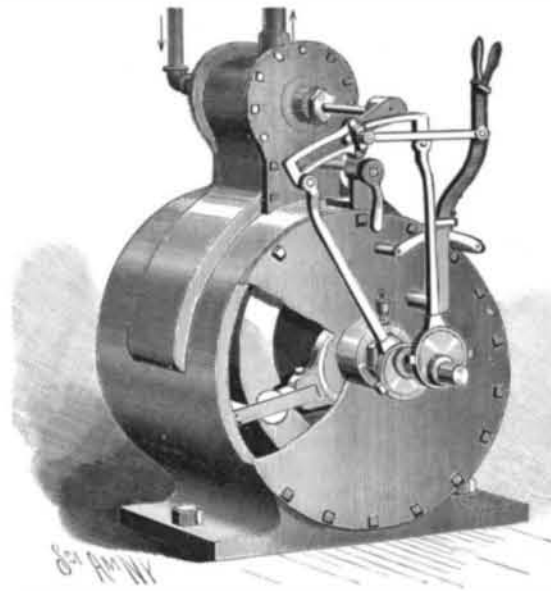
When it is desired to change the pinions, the coiled spring in the reduced end of the disk shaft is made to yield longitudinally, so as to permit both shafts to be moved closer together or farther apart, depending upon the size of the new pinions.

The gearing is the invention of Daniel Fyfe, of Covington, Tenn.

MORE or less aluminum is now utilized in the manufacture of scales, especially in the more delicate machines. Many makers use aluminum for beams, pans, riders, bars, levels and bows, in making their fine balances and weights. By using aluminum, greater delicacy can be attained in weighing than when the scales are made of heavier metals, while it is easier to make levels of aluminum, for the metal can be more readily spun around the glass of the spirit level than brass.

**A NEW ROTARY ENGINE.**

The rotary engine illustrated by the accompanying engraving comprises a cylinder in which a power shaft is eccentrically mounted. The wall of the cylinder has exhaust ports leading from its central portion and communicating with an exhaust port in the head on the cylinder. Inlet ports are also provided which conduct steam from the head to the interior of the cylinder. The head has a steam port designed to



**MACEY'S ROTARY ENGINE.**

communicate with a hollow cut-off valve mounted to oscillate in the head and having an open end into which the live steam may enter. A piston disk is mounted on the shaft eccentric to the cylinder, so that its upper portion will engage the upper portion of the interior of the cylinder, thus providing an abutment for the steam. Piston wings are movable in oppositely extended openings of the piston disk and the opposite ends of their inner portions are provided with segmental straps engaging with rings secured to the cylinder eccentrically to the shaft. Rocking-blocks oscillate in concave recesses at the outer ends of the openings in the piston disk, and between these rocking-blocks the wings slide as the piston rotates. A lever on the exterior controls a reversing valve in the head and may be turned into register with either of the two sets of ports, depending upon the direction in which it is desired to run the engine, thus providing a means for reversing. A simple arrangement of levers and eccentric rods connected respectively to the cut-off valve and the shaft enables the steam to be cut off at any point where it is desired that the expansion shall take place. The engine has been patented by Fred J. Macey, of Ontonagon, Michigan.

**A COIN-CONTROLLED BICYCLE-PUMP.**

A patent has been recently issued for a novel bicycle-pump, which is controlled by a coin. The pump is put in operative position by the insertion of a piece of money and thrown into inoperative position by the removal of the wheel. The device is the invention of Lewis S. Brown, of 1242 N. High Street, Columbus, O.

In this invention a frame is mounted on a stand provided with two hooks for supporting the lower portion of a bicycle wheel. A third hook is secured to a vertical support connected to the frame, and receives the upper portion of the wheel. A bicycle pump is provided which is operated by a crank-wheel mounted on the vertical support and connected to the pump-rod by means of levers and bars. This crank-wheel is turned by a larger wheel made to resemble a bicycle wheel, and provided with a handle. In the upper portion of the frame is a casing containing the pump-controlling mechanism.

In operation, the bicycle wheel is first placed in position and the tire connected to the pump. A coin being then dropped into a slot, acts upon a locking lever to release a plug-valve, which may then be turned by hand engagement of an outside lever, so as to connect the tire and the pump. A locking arm is also connected with this lever, and is moved thereby to clasp and lock the wheel in place. When this locking arm is thrown back to release the wheel after the tire has been inflated, the valve is closed and the valve-locking lever drops into place, preventing the valve from opening until another coin has been inserted.

M. GENTIL'S expedition has succeeded in working its way down the Chari River into Lake Chad, which it has explored, and in getting back to French territory, after making a treaty with the Sultan of Bagirmi.

**Soldering of Aluminum.**

The soldering of aluminum has always been a difficult problem, and the problem has not been, up to the present time, completely solved.

The difficulties in soldering aluminum arise from :  
1st. The high heat conductivity of aluminum ; and  
2d. The fact that none of the ordinary soldering salts, or any easily obtainable soldering salt, will clean the surface of aluminum.

On account of the high heat conductivity of aluminum, the heat from a soldering iron is conveyed away from the iron and from the solder so rapidly that the solder does not become sufficiently liquid to flow readily. This can be overcome to a large extent by taking steps to counterbalance the spreading of the heat. If the aluminum pieces to be soldered are small and thin, then naturally the difficulty is not so great as when the aluminum pieces are heavy and absorb a large amount of heat. In this latter case the soldering iron should be kept at a higher heat than is usual and the aluminum pieces should, if possible, have been warmed beforehand.

Whereas aluminum is properly spoken of as a non-oxidizable metal, nevertheless the surface is covered with a very thin film of oxide, which prevents the solder from amalgamating with the aluminum. The most natural and simple way to remove this coating is to scrape it off with emery cloth or a file. If this is not possible, then it can be done by dipping the edges to be joined in a solution composed of about :

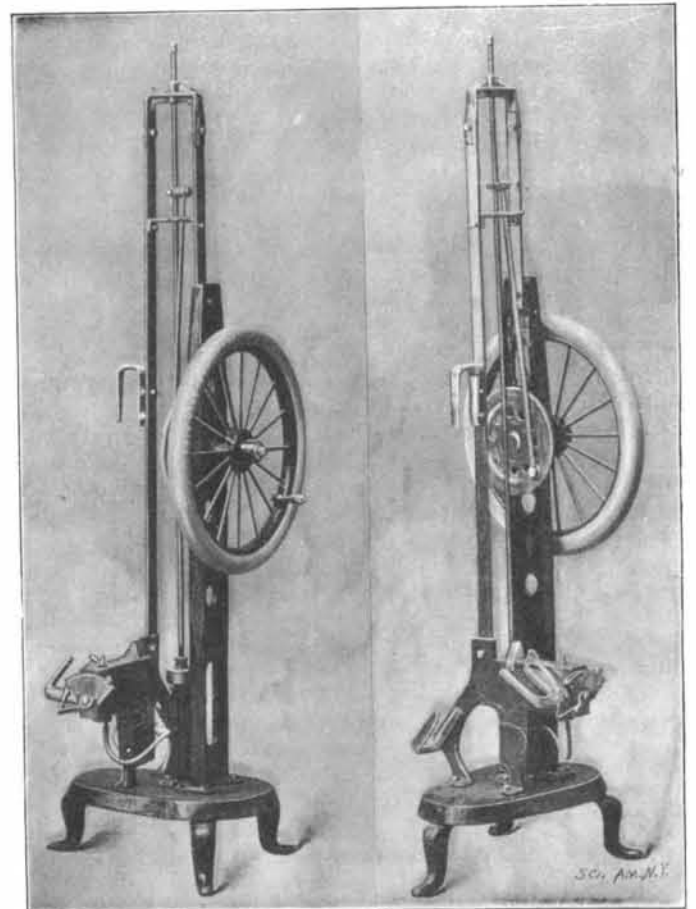
Hydrofluoric acid.....	1 part.
Nitric acid.....	10 parts.
Water.....	50 "

Or in a solution, first of caustic soda, and then strong sulphuric acid.

Many manufacturers, after some attempts with indifferent results, are now soldering aluminum with considerable success. Experience seems to be a very important factor in the successful accomplishment of the soldering of aluminum. A workman who perhaps is experienced in the soldering of other metals will meet with considerable difficulty in the soldering of aluminum, but these difficulties become less, and in time practically vanish, as the experience of the workman increases.

The Pittsburg Reduction Company, who have collated the above particulars, do not, however, recommend soldering, if any other means of making a joint can be employed. Soldered joints in aluminum, even when well made, are not as strong as soldered joints in other metals, and on account of the galvanic action between the solder and the aluminum, the joint will gradually disintegrate, especially if, by exposure to water or by other means, the conditions are particularly favorable for galvanic action. In dry places, however, a soldered joint will apparently last an indefinite time.

In view of the high heat conductivity of aluminum, it follows that a solder which will melt at as low a temperature as possible should be used. There are a



**COIN-CONTROLLED TIRE-INFLATER.**

number of solders on the market having this characteristic, or one can easily be made to suit the occasion. Nearly all aluminum solders contain a small portion of phosphor tin.