RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week; the claims may be found in the official list:—

Shaft Coupling.—This invention relates to a new and improved coupling for shafting, and it consists in the employment or use of a divided collar, provided with one or more screws or screw threads and conical surfaces on its exterior, in connection with nuts and female cones, or thimbles having conical interiors to work on, the conical surfaces of the divided collar all being arranged in such a manner that shafting may be securely connected with the greatest facility, and also secured together in line, one shaft with another, thereby avoiding much trouble hitherto experienced in putting up the shafting of machinery. James P. Collins, of Troy, N. Y., is the inventor.

Turning Machine.—The object of this invention is an improvement in that class of machines which are intended to turn automatically conical or other articles of a regular or irregular form, and of variable diameter. The invention consists in the application for the purpose of feeding the stuff to be turned of a screw-thread cut in the guide, either in front or behind the roughing-out tool, in such a manner that the stuff on entering the guide will work into said screw-thread, and by its action will be fed to the tool for a distance corresponding to the pitch of the thread, at each revolution which it makes, and a quick, automatic and uniform feed is effected. It consists further in the use of a forked guide made to straddle the roughing-out tool, and to spring open in such a manner that the stuff is securely guided on both sides of said tool, and by throwing the jaws of the guide open any impurities lodging in the guide holes can be readily removed, and when the jaws are closed upon the stuff the feed screw bites into the surface of the same, and causes it to be fed without further attention of the operator or attendant. It consists further in the employment of a rotating cam acting on the slide rest, in which the finishing tool is secured in such a manner that by the action of the said rotating cam the motions of the finishing tool and the shape of the article to be turned is governed. Finally, in securing the cutting-off tool in a sliding head, rendered yielding by the action of a spring, in such manner that said cutting-off tool is enabled to act, while the stuff is continually fed along by the action of the feed screw. Chas. G. Bloomer, of Wilkford, R. I., is the inventor.

Match Machine.—This invention consists in the employment or use of one or more hoppers filled with cards, in combination with a suitable feed apparatus and set of knives, in such a manner that one card after another is taken from the hopper automatically and exposed to the action of the knives, to be cut up in single strips of the requisite thickness; also in taking the cards from the bottom of the hopper or hoppers, so that the same by their inherent gravity are brought in the requisite position to be fed to the knives, until the hoppers are exhausted; further, in arranging the knives in sections, separated from each other by suitable intervals so that each card is cut up separate, and the matchstick so cut can be easily kept in separate tiers, and the feeding to the rack is facilitated; also, in the use of guides in front of the knives, and placed opposite the intervals between the several sections, to keep the match sticks in separate distinct tiers; further, in the employment or use of a rack, to which an intermittent motion is imparted, in combination with the guides, the knives and the feed apparatus, in such a manner that one tier of matches after the other is automatically pushed between the slats of the rack, as the same arrive successively in a position opposite the table; also in the application to the slats of two or more elastic bands or springs placed round said slats, at suitable intervals, in such manner that they hold the same together with a yielding pressure, and the frames are enabled to hold the match sticks, and to accommodate themselves to sticks of different size and thickness; finally, in subjecting the match sticks, after they have been passed between the slats of the rack, to the action of combs or other suitable device, in such manner that the same are automatically slipped, or, in other words, that the alternate sticks are pushed out in opposite directions, to keep their ends separate while dipping. Emory Andrews, of Springfield, Mass., and Wm. Tucker, of Uxbridge, Mass., are the inventors.

Wind Wheel.—The object of this invention is to obtain a cheap, safe, and reliable mechanism for obtaining power from the wind, designed more especially for driving light machinery for household or domestic purposes, such as churns, washing machines, grind-stones, wood-sawing machines, etc. The invention consists in combining with a wind wheel, of novel construction, a mechanism provided with a weight; all being arranged in such a manner that the wind wheel, when in operation may raise the weight, and render the mechanism aforesaid available as a motor which may be used when there is no wind and the wind wheel consequently inoperative. Robert S. Smith, of Stockport, N. Y., is the inventor.

Railroads.—This invention relates to a new and useful improvement in what are generally termed sheet railroads, and it consists in constructing the rails with indentations in their edges, so as to form a series of short inclined planes at both sides of each rail to enable the wheels of common vehicles to release themselves from the track or pass over the rails when approaching them obliquely. Great difficulty is now experienced in getting the wheels of common vehicles over the rails, when presented obliquely to them, and when the wheels are inside of the rails they are frequently materially injured and strained in crossing the latter, in consequence of the barrier the rails present to them. A difficulty which is fully obviated by this invention. Theodore M. Schleir, of Nashville, Tenn., is the inventor.

Casks.—This invention relates first, to a means employed for preventing the cask being injured by the removal of the bung. The ordinary wooden bung, as is well-known, requires to be started or loosened by striking the stave in which it is fitted by means of a mallet or hammer, and this operation after being repeatedly performed injures and breaks or splits the stave. To obviate this difficulty is one of the objects of this invention, and to effect such result a portion of the stave in which the bung is fitted is constructed of metal, and fitted between the wooden parts in a firm and substantial manner. The invention relates, second, to an improved means employed for applying a faucet to the cask, whereby the former may be inserted in the head of the latter, with the greatest facility and without the slightest danger of the escape of any portion of the liquid contents of the cask or gases contained therein. Frederick Acker, of San Francisco, Cal., is the inventor.

Steam-Engine Governor—This invention consists in a spindle furnished with spiral blades or wings rotating in a cylinder containing oil or other liquid, and a spring or weight applied to the said spindle to press it longitudinally in one direction. The pressure of the faces of the blades against the liquid caused by their revolution, tends to produce a longitudinal movement of the spindle in the opposite direction to the pressure of the spring, such tendency being greater or less according to the velocity of revolution, and the spindle being connected with the regulator of the engine or motor, its longitudinal movement is made the means of operating upon the regulator to govern the movement of the engine or motor. J. T. Rich, Rahway, N. J., is the inventor.

How Magnesium is Made.

The process by which Mr. Sonstadt produces the metal is as simple as it is ingenious. The lumps of the carbonate of magnesia are placed in large earthen jars with a quantity of muriatic acid. The solution thus obtained is drawn off when clear, and mixed with a solution of chloride of sodium, or potassium. This mixture of magnesium and the alkaline chlorides is subjected to heat in porcelain basins until the moisture is evaporated. The dried mass remaining is fused in a platinum crucible, and when poured out is technically known as "material." To deal with this a furnace is required, and the aid of sodium, which has already enabled chemists to obtain one of the latest metalllic contributions to civilization—namely, aluminum. So important is the part played by sodium, that upon its price almost entirely depends the cost of magnesium. To make the latter cheap enough to be generally useful, it will be necessary to discover some less expensive mode than the present of obtaining sodium, and that it is to be hoped will be done shortly. The material is submitted to heat in an iron crucible to liberate the magnesium. The metal thus obtained is still unfit for commerce, being brittle and unworkable. It is purified by distillation in closed vessels, somewhat upon the principle of mercury distillation from cinnabar. The finished metal is brought into the form of wire, in which state it has alone been used hitherto, by forcing through a small orifice by hydraulic pressure. Inasmuch as sodium and magnesium are not unfrequently found in sea water in proportion which would not be inconvenient in the manufacture of magnesium, it is to be hoped that at no distant period a mode of extracting the double chloride from the water direct will be discovered, for there can be no doubt that if cheap, a variety of purposes to which the metal could be applied would speedily be discovered.—*London Mining Journal.*

Manufacture of Aluminum.

The alkaline metals have hitherto been considered the only agents for reducing the chlorides of aluminum, but Mr. N. Basset, of Paris, has discovered that the metalloids and metals which by double decomposition will form chlorides more fusible and volatile than the chlorides of aluminum may be employed for reducing these latter. For instance—arsenic, boron, cyanogen, zinc, antimony, mercury, and even tin, may be used, and also the amalgams of zinc, antimony and tin. The inventor prefers to use zinc, owing to its low price, its facility of application, its volatility, and other useful properties. The zinc should always be added in excess in the proportion of, say, four of zinc to one of chloride of aluminum. When this latter is brought into the presence of zinc at a temperature of from 250° to 300° centigrade, a chloride of zinc and free aluminum is obtained. This latter will dissolve in the excess of zinc, and the chloride of zinc combining with the chloride of sodium, the mass becomes thick or pasty, and then solid, while the alloy of zinc and aluminum remains liquid. If the temperature of the mass is again raised it all becomes liquid again, and the zinc reduces another proportion of chloride, and the excess of zinc becomes enriched with an extra quantity of aluminum. The rich alloy is again melted with the addition of more chloride of aluminum, and kept well stirred or agitated, until nearly pure aluminum, with only a small per centage of zinc, is obtained. This is again melted at nearly a white heat, until the remaining zinc is volatilized, and pure aluminum remains.

LIBRARIES FOR SOLDIERS IN THE FIELD.—A laudable enterprise has just been undertaken by the Christian Commission and is being practically carried out, viz:—to provide libraries for our soldiers in the field. In order to secure 300,000 volumes of good choice books every friend at home is asked to purchase and send one or more to the Christian Commission as a New Year's gift to the soldiers. They will be assorted and forwarded to the proper quarters under the care of the agents of the Commission.

AN IMMENSE telescope has just been completed for the Chicago University. The object glass is worth $11,187, and required two years for its completion, by Mr. Alvan Clark, of Cambridge, Mass. The telescope weighs 6,000 pounds, the length of the great tube being eighteen feet, and the magnifying power ranging from eighty to eighteen hundred. The entire cost of the instrument was $18,187; the cost of the observatory $25,000.

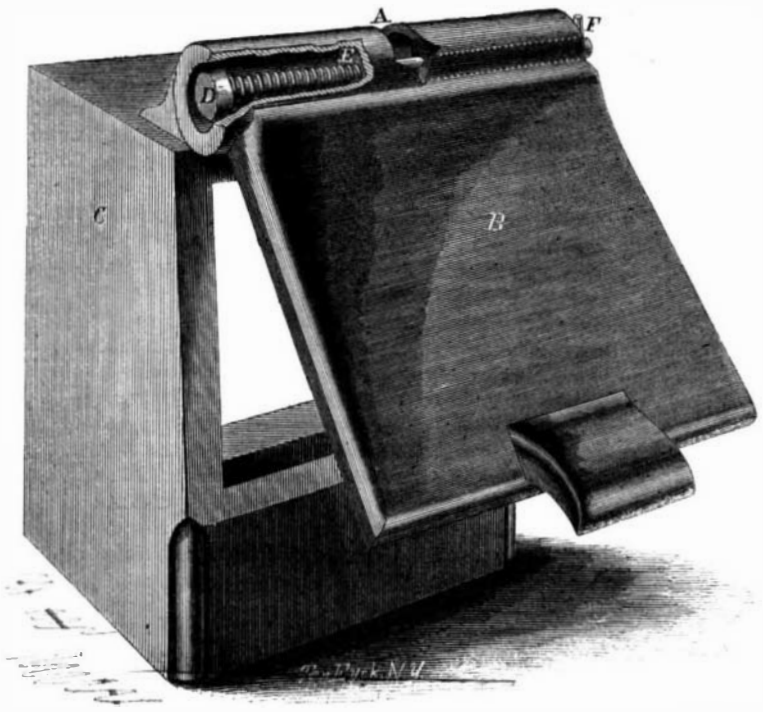
A DENTIST wishes the press to correct the statement, made on Horace Walpole's authority, that alum is a preservative of the teeth. He says it is on the contrary one of the most destructive agents with which the teeth can come in contact.

ECLIPSES.—Next year there will be four eclipses—two of the sun and two of the moon. The eclipses of the sun occur on the 25th of April and the 15th of October; those of the moon on the 11th of April and the 3d of October.

The British war corvette *Scout* has been selected by the Admiralty to have her midship sides protected by means of chain cable, in a plan similar to that adopted by the United States steamer *Kearsarge*, when in action with the *Alabama*.

Improved Axle Box.

The common axle boxes in use on railways are very inconvenient things, as regards the covers. On most of them a screw wrench must be used before they can be oiled. These screws are continually jarring out, or breaking off, so that the covers are lost on the road, and have to be renewed very often. In the box here shown no screws are employed, the casting being solid and the cover kept down by a cam-shaped hinged joint, A. This joint is halved in the center, one wing being on the cover, B, and the other on the box, C. A bolt, D, having a spring, E, slipped over it, fits the projection on the box, and by means of a pin, F, in the opposite end, draws the cover up to the box and holds it fast in either position, open or closed. The cover is shown partly raised in the engraving, and the lug on the box is broken out to expose the springs. This is a very useful improvement, as it is durable, efficient and free from the objections which attach to screws. A patent is ordered to issue on it through the Scientific American Patent Agency, by S. T. Shelley, of Louisville, Ky.; for further information address him at that place.



SHELLEY'S AXLE BOX.

THE RUHMKORFF COIL.

On the 23d of February 1852, the Emperor of the French offered a prize of 50,000 francs to be bestowed, after five years, to the author of the most important discovery concerning the applications of electricity, and a commission, composed of thirteen of the most eminent men of science in France, was appointed to award the prize. In 1857, the commission reported that they had not judged any discovery sufficiently eminent to receive the large reward, and prayed that the time might be extended for five years more. The last number of *L'Invention* contains a long report of the Commission, signed by M. Dumas, the President, awarding the prize to M. Ruhmkorff, the inventor of Ruhmkorff's coil.

The report says, "M. Ruhmkorff was a workman for some of our best constructors of instruments of precision, and finally chief, in his turn, of a house, the celebrity of which increases and extends each year. His education was made little by little, by reflection, by the study of a few books meditated without ceasing, and by the lessons of a few professors, heard, as it were, by stealth, at very rare hours of leisure. Modest in his life, of a perseverance which nothing could distract, of an abnegation which merits the most illustrious testimonials of esteem, M. Ruhmkorff will remain as a type worthy to serve as a model to those numerous intelligent workmen who people the workshops of precision of the capital."

As we have recently promised to a correspondent an explanation of the Ruhmkorff coil, we will give it in this connection. If two wires are placed parallel and near each other, and a current of electricity from a galvanic battery is passed through one of them, at the instant when the current commences there is a momentary current through the other wire in the same direction. This secondary or induced current immediately ceases, although the primary current is continued. But if the primary current is broken, another wave passes through the parallel wire but in the opposite direction.

If the wire for the primary current is wound in the form of a helix, and a finer wire, properly insulated, is wound in a second helix around the first, the force of the induced current is greatly increased.

All of these facts were discovered by others than Ruhmkorff; his invention consists in a device for breaking and renewing the primary current automatically, so that the machine would give a succession of induced waves through the outer helix without any manipulation. His plan is exceedingly simple. He cuts the primary wire and attaches to one of the cut ends a hammer of soft iron, which rests upon an anvil connected with the other cut end. Thus the circuit is closed, but can be broken by raising the hammer. He now places in the axis of the helix a bundle of soft iron wires, with their ends just over the hammer. When a current of electricity is sent through the helix, it makes the wires magnetic, and the hammer is attracted upward; breaking the current. On the breaking of the current, the wires cease to be magnetic, and the hammer falls; again closing the circuit. When the machine is properly constructed the current is thus automatically broken and closed several hundred times in a minute.

The induced current of the Ruhmkorff coil combines the large quantity of galvanic with the high intensity of frictional electricity, and in this consists its value for many scientific and industrial purposes.

SQUIRE'S FRUIT JAR.

During the last summer articles on preserving fruit

were published in the Scientific American which pointed out defects in the present jars, and hinted at improvements which would make them much better The jar here illustrated is, we are assured by th inventor, one result of our suggestions, and othe readers may take the hint thus thrown out, and ac upon it with advantage to themselves.

This jar provides against any cavity or space above the fruit. It is well known to all practical persons that heat expands the bulk of the fruit so that when cold the contents shrink and leave a space above which is detrimental. Mold accumulates on the top of the fruit and destroys its commercial value as well as the flavor. To provide against this defect the jar must be filled, as the fruit shrinks, with sirup, so that when at a moderate temperature no cavity will exist.

The method of doing this will be understood by perusing the description. The fruit is first scalded, or not, as desirable, and put in the jar; after which the cap, A, is pushed down to its place. There is a rubber gasket between the cap and the jar, so contrived that the fruit does not come in contact with it, which makes an air tight joint between the two glass surfaces. The fruit in the jar is then brought to the boiling point by being placed in a common boiler heated gradually. The fixed air remaining in the jar is expelled through the small hole, B; and the clamp, C, which works on a strong glass stud, D, is shifted round until the holes are covered; the clamp has a rubber ring, E, slipped over it, which keeps the surfaces below it air tight, and its ends work in a scroll groove in the neck of the jar. The jar is then removed, and as the contents fall by shrinking, additional sirup is poured in through one of the orifices, the air within escaping by the other. In this way the jars are filled to the very top, and no mold accumulates.

Another good feature in this jar is the application of the points, E, to the bottom. All persons who have canned fruit must have noticed a propensity in the jars to upset when the water surrounding them boils. This is occasioned by the confined air under the bottoms which, in seeking to escape, oversets the jar unless care be taken to prevent it. The jars are also frequently broken at the bottom from being taken out and set on colder surfaces, the difference in temperature cracking the glass quickly. Both of these defects are obviated in this jar, for the space beneath allows the air to escape, and the slight surface presented by the points permits the vessel to be set any where with impunity; they also strengthen the bottom.

The combination of these several features should make a most excellent fruit jar, and we predict for it a large sale when its virtues become known. It was patented through the Scientific American Patent Agency, on Oct. 18th, 1864, by John J. Squire, of Windsor Locks, Conn. For further information address him at that place.

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The Hecker and Waterman Experiments.

It will be remembered that to complete the programme laid out by Mr. Waterman at the commencement of his experiments, one series of 4 experiments of 30 hours each was yet wanting. There has been a delay in repairing the engine before completing this series, but we learn from Mr. Waterman that the engine is now in order, and that the experiments will soon be finished.