

this effect is governed by the composition of the glass, lead glasses being easily acted upon, and furnishing a very fine matt surface.

Where it is desired to have the surface of the glass not altogether matt, but shining like ice, as in the case of window glass, this may be attained in a simple manner by placing the glass plate in a perfectly horizontal position and covering it with fine groats. Then very dilute fluoric acid is poured upon it. The groats act as a shield, and produce upon the glass raised points.

Several ways exist of etching photographs on glass. A good result may be secured by covering the surface with a solution of gum made sensitive with bichromate of potash, and printing the same under a negative; after the image has been thus produced, it is dusted over with minium or red lead, and the red picture thus obtained is fixed and burnt in the usual manner. The easily soluble red glass, so obtained, is treated with strong sulphuric acid, when a white matt design is produced, and the picture appears by transmitted light as a positive.—*Photographisches Archiv.*

Power of Wooden Vessels to Withstand Pressure.

We have lately received a communication from a correspondent at Dayton, O., referring to an unfortunate occurrence, which caused the instant death of one man, and the narrow escape of several others. It seems that a number of men, in the employ of a manufacturer of artificial mineral waters, were in the act of charging a quantity of water, contained in a large iron-bound oaken cask, with carbonic acid gas, at a pressure of 130 lbs. to the inch. The cask, without any previous warning, exploded, with the results above stated. The explosion was sufficiently severe to splinter the cask and the three-inch planking over head. That such accidents are not of more frequent occurrence is to be wondered at; and under such circumstances we cannot but consider the employment of such vessels criminal. We have often cautioned persons against employing wooden casks for this and similar purposes; as it is evident from their construction that, under such conditions of pressure, the whole strain must come upon the hoops and binding clamps, which, unless of extreme strength, could not be expected to withstand such strain as they were placed under in the above instance. Besides, such vessels are always of doubtful efficacy for such purposes, for, where they hold liquids under pressure, even provided it were possible to render every joint tight, the liquid would gradually ooze through the pores of the wood; and if it so happened, as in the instance above cited, that the liquids contained a free acid, the metal bindings would speedily become corroded and weakened, thus rendering rupture, in time, certain.

Should personal and public safety be sacrificed to the mere question of economy? And is the incurring of such risks justifiable by the small advantages derived therefrom? Before more of such deplorable accidents as the one here recorded have occurred, it is to be hoped that the proper authorities will take the matter in hand, and prevent further loss of life from such criminal practices.

The World's Age.

Mr. William Chambers, the veteran author and publisher of *Chambers Journal*, contributes to that excellent periodical a summary of some of the many views held by scientists as to the antiquity of our world. The *Quarterly Review* treated the same subject recently, and that most conservative of magazines now admits that the ordinary interpretation of the date of the creation, about 6,000 years ago, is to be set aside as untenable and at variance not only with historic and archæological research, but with the substantial discoveries of geology. The reviewer quotes the opinion that it is impossible that the earth can have existed many millions of years, as the earth is cooling, if not rapidly, at such a rate as to make such an antiquity impossible; and again, there is reason to believe that the earth's rotation is not so rapid as formerly.

The question as to the date of creation must be considered to refer to our solar system alone. The nearest fixed star or sun outside our system—possibly the center of a similar system—is too far off to enter into the question of the age of our sun and its planets and their satellites, being two hundred millions of millions miles away. Sir Charles Lyell gives the date of the Cambrian formation of rocks as at least two hundred and forty millions years ago; while Mr. Darwin assigns to the world a much greater age even than this. Mr. Adams has essayed to calculate the retardation of the earth by the friction of the tidal waves on the atmosphere; and in conjunction with Professor Tait and Sir William Thomson, he allows 22 seconds per century as the time lost by the slackened speed. Mr. Chambers wisely concludes his article as follows: "We can only say that the theories propounded are eminently suggestive, but nothing more. It is not remarkable that there should be differences of opinion among men of science concerning the dark and stupendous questions of the cosmogony of the world. All we deprecate, in the present state of human knowledge, is rash dogmatizing, one way or another."

The Poughkeepsie Bridge.

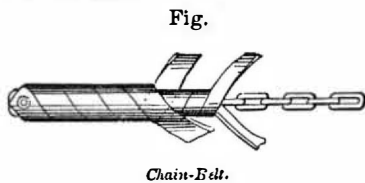
Progress is being made in the construction of the bridge across the Hudson river at Poughkeepsie, a work, which, when completed, will increase the facilities of travel between Pennsylvania and New England. The coal traffic alone, it is anticipated, will bring in a large revenue to the bridge, as the freight to Massachusetts and other manufacturing States will be considerably reduced.

The American Bridge Company is to construct the bridge and its approaches, and the materials for the first caisson are

now being delivered. There will be four piers in the river, built on caissons, the foundation of which will be 85 feet below the surface of the water. The piers will be 525 feet apart, and will be built up of masonry to 130 feet above high water mark. The bridge is to have a double railroad track, a wagon roadway, and a way for foot passengers. It is stated that the Erie railway can cross the Hudson by this bridge and enter New York city, making a *détour* of only 10 miles from its present route, which has the disadvantage of landing its passengers in Jersey City.

CHAIN GEAR AND FASTENINGS.

Our extracts this week from Knight's "New Mechanical Dictionary" include a series of engravings relating to chain, together with others showing forms of fastening rope, etc. These will doubtless prove useful to builders, quarrymen, farmers, and others who frequently have occasion to use tackles, for hoisting heavy weights and for many other purposes.



Chain-Belt.

Fig. 1 shows how a chain, by wrapping it with strips of canvas or leather, may be made into a round belt, whereby power may be transmitted. Fig. 2 is a chain hook which simply clamps one link between two adjacent ones. Fig. 3 shows how chains are fastened by ropes, when, as in the case of a vessel's cable, they are to be subjected to heavy strains. The upper figure is termed a double and the lower a single chain fastening. These hitches are very strong and not liable to slip. Fig. 4 is a chain pulley having pockets or depressions in its periphery, in which lie the links or alternate links of a chain which passes over and



Chain-Hook.



Fig. 3.



Chain-Fastenings.

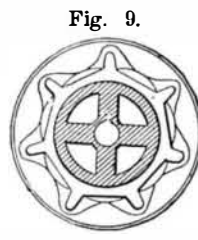
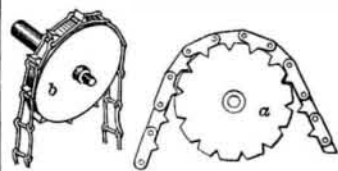


Fig. 9.

Chain-Pulley.

gives motion to or transmits from the pulley. In the chain wheel, Fig. 5, the sprockets of the wheel are adapted to receive the links of the chain successively. The power may be communicated by the wheel to the chain, or conversely. The former is shown in the familiar chain pump, and the latter in machines where the operation is inverted, the column of water pressing upon the buttons attached to the chain and causing them to descend in the tubes, thus rotating the wheels.

Fig. 5.



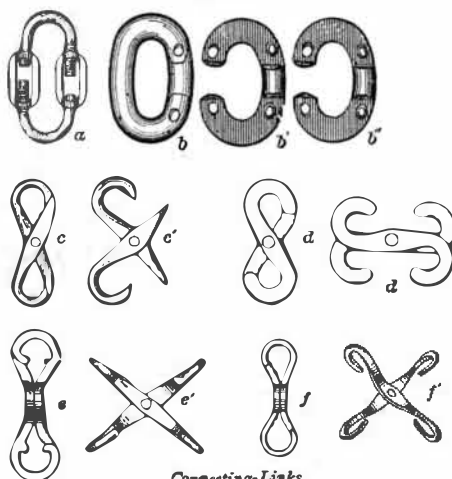
Chain-Wheel.

Fig. 6 represents several forms of

LINKS

capable of being taken apart and thus becoming a means of uniting the broken ends of a chain. Each half of the link, a, has a swivel to which it is connected by a head, the swivel of each part forming a nut for the threaded leg of

Fig. 6.



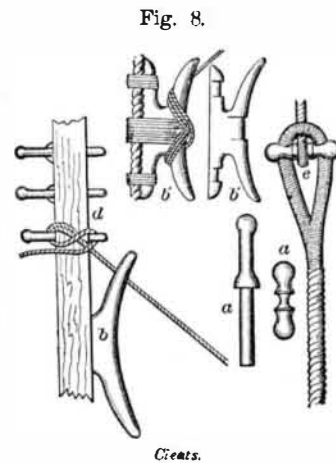
Connecting-Links.

the other portion. The link, b, is made of two sections, b'

b'', laid upon each other and riveted. The other figures represent various forms, in which the twin swiveling portions form a mousing for each other.

CLEATS.

These are belaying pieces, consisting generally of a bar with two arms fastened to a post or stanchion by a bolt passing through its stem. Those shown at a, Fig. 7, are simple belaying pins. d is a rope belayed, b is a common cleat, lashed in place as shown at b'. e is a belaying pin or toggle, spliced into the end of a rope to secure an eye upon. Forms of



Cleats.

CLINCHES are shown in Fig. 8. In nautical parlance a clinch is a mode of fastening large ropes to rings, such as anchors, etc. It consists of a half hitch with the end stopped back to its own part by seizings. a is a slip clinch; b a clinch secured, and c a simple clinch. In carpentry a clinch is a fastening, as at d, in which the long end of a nail is turned over, and the recurved end caused to enter the material so as to oppose retraction.

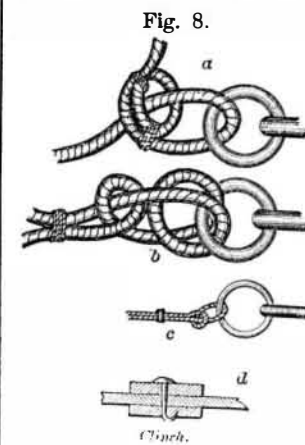


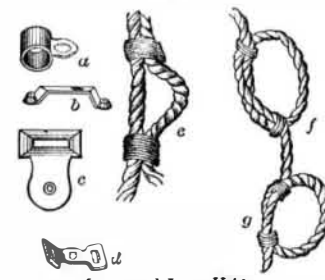
Fig. 8.

Clinch.

LOOPS

of different kinds are illustrated in Fig. 9. a is the simple sleeve or collar; b, c, and d are modifications of the same. e is nautically termed a bastard loop. It is stopped in place with

Fig. 9.



Loops and Loop-Holders.

rope yarns. f is a loop used as a fair leader for ropes, etc g is a bend stopped with seizings.

Gold in America—Its First Discovery by the Pre-Historic Indians.

In a recent speech delivered in the House of Representatives, R. B. Vance, member of Congress from North Carolina, said that the first discovery of gold in the United States was made in Mecklenburg, in that State, in 1820. A correspondent of a North Carolina newspaper corrects this statement, saying that the first gold was found in Cabarrus in 1799, and refers to Wheeler's "History of North Carolina" for evidence.

Old chroniclers give an account of a province called Cofachiqui, which was visited by De Soto's gold-hunting expedition in 1538-40, and which was embraced in what afterward became the States of Florida, Georgia, Alabama, and Mississippi, and, according to Logan, in his history of "Upper Carolina," had its center on the western limits of South Carolina. Its capital and chief town stood upon the tongue of land between the Broad River of Georgia and the Savannah, just opposite the modern district of Abbeville. The Spaniards entered this capital after a two months' march, and found the country ruled by a beautiful Indian queen, Adalla, who entertained the Spanish governor and army with much ceremony. Here they found hatchets formed from an alloy of gold and copper. By this their cupidity was greatly excited, and they concluded that they had found a country abounding in the long coveted precious deposits of gold. And so indeed they had, says Logan (whom we quote freely), but it was neither their good fortune nor their desert to find out the precise spot where gold could be obtained. In less than fifteen miles southeast of the town, on the opposite or Carolina side of the river, lay one of the most extraordinary gold deposits in the world. The Cherokees were well acquainted with the Dorn mine. This is shown by the numerous relics of their handiwork scattered around it, and there can be little doubt that the massive nuggets of its outcropping gold supplied them abundantly with the finer metal of the alloy that so attracted the eyes of the Spaniards. It is no less known, to a few who have inquired into the traditions of the aborigines, that the gold and copper, found in their possession, in the form of solid masses or curious trinkets, by the first white men who visited the country, were obtained from these sources.

The Indian method of smelting these metals was one of the most remarkable devices of savage ingenuity; in practical efficiency the famous blowpipe of Dr. Hare was scarcely superior. Logan tells us that, having first hollowed out

flat stone in the form of a basin, they filled it with charcoal, and upon this laid the nuggets of metals. A number of Indians now seated themselves in a circle around the basin, each one having in his hand a long reed pierced through its entire length and armed at one end with a clay tube or pipe. Everything being ready, fire was applied to the charcoal, and the whole mass instantly blown into a powerful heat through the reeds, the clay extremities of which were inserted in the basin, while the Indians blew through them upon the charcoal with all their might, and with protracted expiration. No ordinary lump of either gold or copper could long maintain its solidity in such a crucible. With this process the Indians could easily produce any variety of ornament from those metals, using them either alone or in alloy. This method was known to have been in use among the Indians who lived upon the gold-producing lands of North Carolina, and the same process must have been known to the Cherokees.

These chronicles and traditions go to confirm what Lawson says, that the Indians, from time immemorial, were acquainted with valuable mines of gold and silver in Upper Carolina.—*Columbia (S. C.) Register.*

The American Institute Fair.

The annual exhibition of the American Institute was opened on September 6, at the Institute's building at the corner of Third avenue and 63d street. Very few of the exhibits are ready for public inspection; and there is likely to be, in consequence, a limited number of visitors for the first few days. This want of preparation does great harm to the interests of those exhibitors who make a point of being ready by the opening day, and damages the reputation of the whole exhibition; but we have so often commented on it that it is, we suppose, useless to hope for any improvement.

NEW BOOKS AND PUBLICATIONS.

THE WORLD'S SAGES, INFIDELS, AND THINKERS: being Biographical Sketches of Leading Philosophers, Teachers, Reformers, etc. By D. M. Bennett, Editor of the "Truth Seeker." Price \$3. New York city: D. M. Bennett, 141 Eighth street.

Mr. Bennett has attempted, as this title shows, to classify together the wisest and best of mankind and the fool (or infidel) who "says in his heart: There is no God." The work is of necessity a signal failure. It is not by placing the names of Socrates, Bacon, Locke, and Colenso in juxtaposition with those of Bradlaugh, Holyoake, S. P. Andrews, and Susan B. Anthony, that any connection between brains and atheism can be established; and it would be a far worthier (and a easier) task for a writer to point out the sharp definitive line which separates the moderate and tolerant philosopher from the blatherskite who proves his want of belief in a God by his perpetual and venomous hatred of all who differ from his crude and frequently blasphemous opinions. The author evidently hopes that this book will, in some households, take the place of the family Bible; for he has bound up in it some leaves for the registration of births, marriages, and deaths.

Recent American and Foreign Patents.

NEW CHEMICAL AND MISCELLANEOUS INVENTIONS.

IMPROVED BRUSH-HOLDING RUBBER STOPPLE.

Ferdinand A. Reichardt, New York city.—This is an improved rubber stopple for bottles, which is so constructed as to serve as a holder for brushes, which may thus be kept within the bottle, and may be exchanged as required. The tapering rubber stopple has its inner end perforated with a tapering hole, to receive and hold a brush handle.

IMPROVED DINNER PAIL AND LANTERN.

David T. Platt, Greenwich, Conn.—This invention consists of a dinner pail with a compartment for heating tea and coffee, contrived to serve for a lantern for the workman going home at night.

IMPROVED CHEESE CUTTER.

Henry S. Jones, Vincennes, Ind.—This invention is a cheese cutter, by which retailers of cheese and others may cutoff pieces that will weigh exactly, or nearly so, the amount required, and at the same time cut them of uniform wedge shape, and from the outside to the center. It consists of a circular horizontal revolving table for holding the cheese, with a graduated scale, showing the sizes for different weights, over which is a radial lever cutter, pivoted to a standard attached to the bed piece on which the table revolves, and being adjustable up and down on the standard, to adjust it to the thickness of the cheese.

IMPROVED TELEGRAPH KEY.

James O. Byrns, Jersey City, N. J.—This is an improved duplex key, by which the time taken up by the upward motion of the present key may be utilized, and the sending of the messages be accomplished in about half the former time, and with greater facility and ease. The invention consists of two horizontal and spring-acted keys, whose contact points alternately close the circuit by contact with an intermediate post, the keys being cut out, when not in use, by the rear set screws bearing against a double post with a dividing insulating layer. The contact of either key closes the circuit, so that by the alternate wording of the keys the working of the hand is utilized in both directions for the transmission of telegraphic characters.

IMPROVED CANNON.

Richard B. H. Leighton, Jersey City, N. J.—This invention is a cannon so constructed as to scatter the shot in a horizontal line. It is provided with a wide, flaring, and shallow bore, and is formed of top and bottom plates, side pieces, and breech piece, riveted to each other. In the inner side of the bottom plate is formed a transverse groove to receive a rib formed upon the lower side of the shell of the cartridge, to keep the cartridge square when putting it in, and also to prevent the cartridge shell from being blown out when the cannon is discharged. Round or square, grape or chain shot may be used, as desired. It is claimed that, with this construction, the wide shallow, flaring bore will scatter the shot in a horizontal line, so that it will do much better execution than when a bore of the usual form is used.

IMPROVED COMBINED BUCKLE AND SNAP.

Richard St. L. B. Chinnery, Kankakee, Ill.—This improved buckle and snap is for connecting the reins to the bit rings, and is so formed that it may be colored to represent leather. It consists of the long bent metal strap, the short straight metal strap, the spring, and the buckle, constructed and combined with each other.

IMPROVED ICE CREAM FREEZER.

Charles L. Dexter, Philadelphia, Pa.—This improved machine for making ice cream is so constructed as to operate upon the cream, while freezing, in about the same way as when it is made by hand. This is effected by the combination with an ice cream freezer, of an outer tub having arms, friction rollers, and angle irons, with the inner revolving can and the necessary operating gearing.

IMPROVED CIGAR BOX.

Thomas A. Dodd, Providence, R. I.—The object is to furnish an improved cigar box, which shall be so constructed as to allow the ends of all the cigars in it to be seen, as well as the top layer. The invention consists in a cigar box provided with a glass front, and having a flap hinged to the forward edge of its top, to shut down over said glass front to prevent breakage.

IMPROVED WEIGHING SCALES.

Alonzo Pangburn, Fremont, Ohio.—This consists of one or more beams, in combination with the ordinary beam, connected by suspending the short arm of the additional beam to the long arm of the preceding one, under which it is located, in such manner that the range of the scale can be increased to any extent required. It also consists of a secondary beam to the principal beam for weighing small articles.

IMPROVED COMBINED BUCKLE AND SNAP HOOK.

Francis J. Deisz, Pierce City, Mo.—This is an improved buckle and snap hook, for connecting a breast strap with the hames in such a way as to be easily attached and detached, and which will hold the straps securely. Any strain upon the strap causes a wedge block to clamp it more tightly and hold it more securely, a tongue preventing the strap from slipping before the wedge block has clamped it firmly.

IMPROVED REVOLVING BILL HOLDER.

Sylvester W. Maynard, Kingston, N. Y.—This furnishes a neat and compact device for filing bills, receipts, and other papers, in such a manner that they are instantly and conveniently within reach. It consists of a number of receptacles, with spring-acted covers arranged around a central section or case, and revolved or locked by a sliding and spring-acted shaft and fastening device.

IMPROVED HAME.

August H. W. Michaelis, Monroe, Mich.—This invention consists in breast strap rings attached to the hame tug clips, and in the fastenings provided with the guards and the pins and the loops, in combination with the perforated upper part of the hames, for connecting the hame strap adjustably with said hames.

NEW MECHANICAL AND ENGINEERING INVENTIONS.

IMPROVED BRICK MACHINE.

Richard A. Drawdy, Jacksonville, Fla.—This invention consists in two parallel rollers geared to each other, revolving toward each other, placed in an opening in the bottom of the mud box of a brick machine, and driven from the shaft of said mud box by suitable connecting gearing, and also in the combination of the platform and its rollers with the frame, the mud box, and the rollers of a brick machine, so constructed as to force out the clay into the molds with a continuous pressure, so that there can be no imperfectly filled molds, as there will be when the bricks are molded with an intermediate pressure.

IMPROVED ORE-STAMPING MACHINE.

John Patterson, Belfast, Ireland.—In stamping of minerals and metals there is much difficulty experienced, owing to the substances under operation, when finely divided, getting into the bushes or guides of the stampers, and not only causing much increased friction, but wearing away the said bushes or guides and stamp rods; and in stamping of animal and vegetable substances and textile fabrics and fibers, great inconvenience is experienced from the dropping of the lubricating material on to the substances to be stamped. In order to overcome the above injurious effects, the inventor employs vibrating levers to transmit the motion of the crank shaft, through springs and flexible connections, to the stampers.

IMPROVED DOOR LOCK.

Moses C. Hawkins, Edinborough, Pa.—This lock may be used as a fixed tumbler lock or as a combination lock, in combination with keys having fixed or interchangeable bits. It thus may not be easily picked or tampered with. There is a sliding bolt, with interchangeable tumblers pivoted thereto, and so connected to the casing by a detachable screw that bolt and tumblers may be taken out from the casing for changing the combination. The invention consists, further, in the combination of the sliding and notched bolt and the notched tumbler, pivoted thereto, with a swinging fence plate and rigid fence bar, that enters all the notches when set by a combination or reversible key. The reversible key may be finally locked to the inside of the lock by a revolving escutcheon.

IMPROVED PISTON FOR SYRINGES, AIR PUMPS, ETC.

Reinhold Vander Emde, New York city, assignor to himself and Charles E. Koehling, same place.—This invention consists of a piston rod provided with shoulders and elastic collars, that hold intermediate leather washers placed over the same. The washers and collars are readily replaced when worn out by long use, but keep up their working capacity for a long time by the action of the rubber, without getting loose.

IMPROVED WINDMILL.

Daniel Nysewander, Springfield, Ohio, assignor to himself and David Nysewander, same place.—This invention consists in making the vanes of windmills from sheet metal, of such form that it is possible to attach the points, which are bent over toward the center, to a central plate which is fixed on the end of the shaft. Weights are provided at the extremity of the arms, for balancing the wheel and giving it additional momentum when in motion. There is also a convenient device for changing the relative position of the guiding vane, making it possible to control the motion of the mill by this means.

IMPROVED WATER WHEEL.

Leonard Long, Princeton, Wis.—This consists, mainly, of buckets arranged between an interior cone hub and an exterior cone cylinder, the buckets extending from an outer top flange of the inner cone on an inclined segment of a circle to the cone cylinder, and then on an inward and downward spiral curve to the bottom of the same and the lower part of the cone hub.

IMPROVED WATER WHEEL.

Burrell C. Lambeth, Thomasville, N. C., assignor to himself and I. L. Younc, same place.—This consists of a novel contrivance of the alternate gates to form chutes, and the device for opening and closing them is contrived to reverse, for application to wheels running either way. The buckets are provided with spring valves, to regulate the opening according to the volume admitted, so that the water will be applied to the wheel in an effective manner, whether the whole or part gate is used. The wheel is constructed so that it can be reversed to run either way by shifting the attaching disk from one side to the other. The socket of the step has a flat bottom, and the pivot on which it turns has a corresponding flat top. The bearing for the shaft above the wheel consists of

boxes let into slots in the tube of the case, the boxes being tapered from bottom up, and being clamped against the shaft by a ring of corresponding form. The case is also reversible by taking off the top and attaching it to the other side.

IMPROVED CUT-OFF FOR STEAM ENGINES.

Julius C. Debes, Jackson, Mich.—This relates to that class of cut-off in which the stroke of the cut-off valves is controlled by the governor; and it consists of a plate placed on a central stud in the steam chest, and provided with oblique slots, which engage with studs on the back of the cut-off valves, varying the time of the admission of steam according to the position of the plate which is varied by the governor.

IMPROVED CAR COUPLING.

David P. Cubberley, Marion, Ind.—The improvements consist in making the latch in the form of a bar of a comparatively small transverse dimension and inclining its rear end (against which the link bears) upwardly, and to the front, so as to cause the link to rise when the draft is exerted and occupy a position more in alignment with the greatest strength of the latch bar, whereby a much lighter latch may be employed, and the manipulation in disengaging the link rendered easier, and whereby also the draft strain is made to assist in holding the latch down.

IMPROVED CAR COUPLING.

James H. Wood, Baltimore, Md.—This invention consists in providing a drawhead with an armed shaft that couples and uncouples with the hook bar, a presser board hinged to the front of the drawhead and forming the cover thereof, and a crank that lifts the presser bar at the same time that it raises the coupling bar. These features of improvement render automatic couplings, heretofore regarded as impracticable, easily manageable and little liable to get out of order.

IMPROVED BELT SHIFTER.

Augustine Crosby, Benton, Me.—This invention is an apparatus for shifting belts for stopping or starting machinery; and it consists of a roller supported in a frame that is placed parallel with and near the tight and loose pulleys on the counter shaft, and is pivoted so that the roller may be made to bear against either side of the belt according to the direction in which the belt is to be shifted. It further consists of an arrangement of a rack and toothed sector, by means of which the roller is moved. The advantages claimed for the invention are that with it belts can be shifted without being subjected to wear, that it is particularly adapted to rubber belts, as it does not chafe them, and that it shifts the belt smoothly, without jarring or noise.

IMPROVED IMITATION STITCH MACHINE.

Edwin Brown, Georgetown, Mass.—The object of this invention is to make what is known as the "imitation fair-stitch" on boots and shoes, that is, indentations on the upper margins of the soles, having the appearance of the stitches by which the soles are sewed on in hand work. It consists of a milled indenting roller on the end of a crank shaft, under which is a carrying roller, made to slide up toward the milled roller by a lever which is to be worked by foot power, to carry the sole and press it against the milled roller, which, being turned by the crank, makes the indentations or imitation stitches, at the same time feeding the work along. The milled roller and its shaft-carrying roller and the lever are all attached to a plate, which may be readily attached to a bench or other suitable support, making, it is claimed, a simple and cheap machine.

IMPROVED AUTOMATIC FERRY BOAT COUPLING.

Thomas D. and George E. Husband, Green Point, N. Y.—This is an improved device for connecting a ferry boat to its bridge, so constructed that it will couple itself as the boat comes into its place, hold the boat securely, and may be easily uncoupled to release the boat when desired. The invention consists in the combination of the sockets, the hooks, the springs, and the levers, with each other, and with a ferry boat and bridge, and in the combination of the wheels, the recesses, and the guide bars, with the ferry boat and bridge for guiding the hooks into the sockets to interlock with the other hooks.

IMPROVED PEG FLOAT.

James Popham and Ebenezer Popham, Montreal, P. Q.—This is a machine for breaking or cutting the projecting ends of pegs from the insoles of boots and shoes; and consists of a grooved cutter, of pyramidal or cylindrical shape, attached to the end of a rapidly revolving shaft, in connection with a protecting guard or casing. The cutter serves to cut off the pegs of long boots, and is for this purpose made cylindrical, with groover and cutting blades at the circumference, for cleaning the peg ends from the sides instead of downwards, and with the pyramidal cutter. One and the same machine may thus be applied, without any special adjustment, to every variety of pegged work, from children's wear to the largest and strongest goods in men's sizes.

IMPROVED DEVICE FOR PUNCHING MACHINES.

Louis Prahar, New York city.—This invention is so constructed as to feed the material forward to the cutting tool as it is required. This is effected by the movement of a pendulum operating feed rollers to carry the material forward to the cutting tool, the rapidity of the feed being regulated by the size of gear wheels.

IMPROVED SHAPING ATTACHMENT FOR ENGINE LATHES.

William Brede, Lihne, Island of Kanai, Hawaiian Islands.—This invention is an improved shaping attachment for lathes, so constructed as to do all the work required by an iron or brass worker, while saving the space that would be occupied by a shaping machine, and at the same time being much less expensive. It consists in the combination of the slotted plate, the arm provided with a dovetail tongue, the blocks, tool holder, and swiveled screw, and the connecting bar, with each other, to adapt them to be applied to the face plate, spindle, and frame of a lathe; in the table provided with the lug, the bent arm, and the adjustable crossbar, to adapt it to be applied to the lathe bed, the carriage, and the frame of a lathe; and in the combination of the cam wheel, the bent lever, the connecting bar, the slotted bar provided with the collar, and the pawl, to adapt them for attachment to the friction wheel and the feed screw of a lathe. For heavy work, the attachment may be strengthened by a brace bar, the forward end of which is bolted to the forward end of the arm, and its rear end is bolted to the bracket or bearing of the lathe.

COMPOSITION FOR LINING PUDDLING FURNACES, ETC.

Marie Eugène Paul Audouin, Paris, France.—This invention is a composition or substance calculated to more effectually resist the action of oxide of iron than any other material heretofore employed for the purpose. This material is oxide of chromium, which is capable of resisting the very highest temperatures employed in furnaces and laboratories—such as the Siemens furnace and furnaces heated by dead oils—and is also proof against the action of oxide of iron at the highest degrees of heat. The inventor claims that there is no danger of the oxide being reduced under the ordinary conditions of working, and, moreover, the presence of a small quantity of chromium will not affect the quality of the iron. This oxide may also be utilized in the manufacture of fireproof blocks to be exposed to the action of furnace cinder and scoria, but with less advantage, as, by the action of certain principles, more especially potash, soda, and lime, chromates are eventually found.