# THE CONTENTS OF A COD'S STOMACH.

Mr. Frank Buckland publishes in Land and Water the remarkable engraving herewith reproduced. The curious object is a mass of horsehair and string, the fibers of which are matted and intertwined well together by means of no less than ten fish hooks. All these are small hooks except two; these, as can be seen by the engraving, are much larger. It is a remarkable thing that the points of all these hooks are turned upwards. He cannot quite account for the presence

cod who owned the stomach had somehow or another managed to get hold of haddocks or whiting caught on hooks, and in whose bodies the hooks still remained. The flesh of the whitings or haddocks had been entirely digested by the juices of the cod's stomach; the horsehair and metal of the hooks, however, resisted its action. That whiting and haddock have frequently hooks left in them is well known to all those who have the care of seals. Sea fish hooks are very cheap; and the fishermen, rather than take the trouble to extract the hook from the fish's mouth, very frequently cut off the "snood" or line to which the fish is attached, and let the hook remain in situ. The seal swallows the fish, hook and all, the hook gets entangled in the poor seal's intestines, and of course proves fatal.

"The cod is what is generally called a vo. racious fish. I have now in my museum." says Mr. Buckland, "a portion of a tallow candle, about seven inches long, also a pair of sailor's mitts, both taken from a cod's stomach."

# THE MYGALES ... DOOR BUILDING SPIDERS.

In the Paris Jardin des Plantes, says La Nature, there is a curious spider belonging to the mygale species, and commonly known as avicular, owing to the supposition that the insect finds its prey in small birds. Like all spiders, this curious creature has eight eyes. Its mandibles are armed with sharp teeth, and its feet have retractile claws, resembling those of a cat. The cephalo-thorax is of a velvety black with an olive luster ; the abdomen and feet are covered with long reddish hair. Its length is about three inches and its breadth seven inches. Only the larger members of the species attack birds, as they overcome their victims by sheer strength and not by poisonous injection; for although they possess venomous capabilities, the quantity of venom is not sufficient to affect large prey. Their favorite food is crickets and insects of large size, which they capture at night, lying ration for a new husband. torpid during daytime.

The most curious member of the species is a mygale indigenous to Corsica, a light brown spider which lies in tubes dug in clay banks. These passages run in a straight line for two thirds of their length, and then become slightly oblique at their inner extremity. A close examination of these remarkable habitations proves the existence in the spider of an instinct wonderful in its minuteness. The tubes are vaulted from end to end with a hard mortar, and this in turn is lined with a soft, silky web. Before, however, covering his walls with their finest hangings, the spider fastens up a coarse fabric, and on this, as a foundation, the more delicate material is secured. Then he begins the construction of his door, in which operation it would seem that almost reasoning faculties are employed. At a hasty glance, the cover appears to be merely a little disk of mortar lined within with web, hinged to one side of the aperture so as to open outward, and supported by a promonstion of the lining n Close examination, however,

direction. But the mygale provides for that contingency, and, being unable to make a lock for his portal, converts himself into that necessary means of security.

The interior of the cover, instead of being perfectly smooth, is pierced with, perhaps, thirty deep holes; and most of these are located just where a lock would be placed, that is, opposite to a hinge. When the spider finds himself besieged, he pokes his claws into these holes and fastens his sharp of so many hooks in the stomach of this cod, except that the mandibles into the walls of his dwelling. Then, contracting light according to the angle of reflection; but a well pre-



# FISH HOOKS AND LINES FOUND, IN A COD'S STOMACH.

his body, he pulls his door tightly shut, and so defies the inroads of his enemies.

During the day the mygale closes his portal, but at night he opens it slightly, and watches ; should a fly or cricket come within proper distance, he leaps out, the prey is grasped, and the spideris back again in his den, with the door shut, before hardly a fraction of a second can escape.

It is said that only the females build and occupy these marvelous nests, since males have never been found in them. The lords of the spider creation have no fixed habitation, but live under stones and in crevices of trees, and prowl around in searchof their precarious existence. It is probable that they meet the fate of all bachelor spiders, to whom matrimony is death; for it is a peculiarity of the arachnid bride to devour her loving helpmate at the earliest possible moment, and unceremoniously to throw the shell of his usedup carcass out of her nest, when she cleans house in prepa-

enemy knowing enough to force open his door in the proper unknown, of some natural force or property; or it may be an action of one substance on another, susceptible of useful practical application. This is, briefly expressed, the distinction between a discovery and an invention. But the important point to notice is that the value of the accident depends on the kind of man or kind of mind, by whom or by which it is first observed. If the soil is not sufficiently pre pared, the seed will not grow. Thousands of men had seen light reflected from distant windows, and variations in the

> pared mind, on one occasion, suddenly drew from this phenomenon an idea which established the beautiful science of the polarization of light. It is pleasant to read of the manner in which shrewd minds have turned an accidental observation to practical advantage.

> The reflecting apparatus for lighthouses arose out of a wager, if the facts are correctly recorded. Somewhat more than a century ago, some one in Liverpool offered to wager that he would read the small print of a newspaper by the light of a farthing candle placed ten yards or thirty feet distant. The wager being accepted, he coated the inside of a wooden board with pieces of looking glass, forming a rough substitute for a concave mirror: placing a small lighted candle in front of this mirror, the rays of light were reflected, and converged to a focus ten yards on the other side of the candle, and the light at that focus was sufficient to enable the experimenter to read a newspaper. An observant practical man was present. The idea flashed

upon him that, if the light of a farthing candle could in this way be thrown out to a distance, the light of a large lamp could similarly be projected to a mile or miles away. The idea grew into form, and resulted in the invention o the reflecting apparatus for lighthouses.

One day, Lundyfoot, a snuff manufacturer, was dryink some snuff. Through a little neglect, the snuff was allowed to be overheated. till it became charred. Noticing the pun gent character of the snuff, and how it tickled the nose, and knowing that some men like to have the nose tickled more thanothers, he resolved to try whether high-dried snuff could be brought into favor. It notonly did so, but proved a source of wealth to him.

The writer has seen a piece of calico being printed at one of the great Manchester establishments, become a little displaced. The effect was very singular. The diagonal repetition of the pattern produced a forked lightning effect, of a kind which a designer would not have been likely to hit

upon. The master printer suggested the engraving of a design in which the forked lightning effect should be utilized. It proved to be one of the most successful patterns ever introduced by the firm.

One of the producing causes of prosperity of the Staffordshire pottery manufacture was the discovery of a cheap durable glaze. The discovery was due purely to accident. At Stanley Farm, a few miles from Burslem, a maid servant was one day heating a strong solution of common salt, to be used in curing pork. During her absence from the kitchen, the liquid boiled over. Being in an unglazed earthen vessel, the solution, spreading over the outside, produced a chemical action which she little understood, and which did not compensate her for the scolding she received. Some of the elements of the liquid combined with some of those of the highly heated brown clay surface to produce a vitreous coating or enamel, which did not peel off when the vessel was cold The humble brown



shows the door to be far from carelessly constructed. Although scarcely one tenth of an inch thick, it is constructed of upwards of thirty alternate layers of web and mortar,

each layer being imbedded in another, like a series of cups.

The weblayers are extended to form the hinge, so that the latter is stronger in proportion to the thickness of the door. On scrutinizing the edges of the latter, it further appears that they are beveled obliquely inwards, and that's corresponding bevel exists in the orifice of the passage. The use of this arrangement is obvious; for were the edges of the door straight, the hinge would be the only barrier to breaking in the cover from outside, and its delicate material would quickly yield before a strong attack. With the beveled edges, it is, of course, impossible to force the door inwards. In order to hide his dwelling, the mygale covers his door with rough clay so that it cannot be distinguished from the adjacent soil, while the asperities allow him to open it easily in making a sudden retreat. Once in his den, however, it

### DOOR-BUILDING SPIDERS.

vessel acquired historical celeb-

The mygale carries its eggs inclosed in a closely woven rity. A Burslem potter, learning what had taken place, saw cocoon of white silk, forming two rounded pieces, united at their border

# Happy Accidents.

It is a fact, patent to every one conversant with the progress of inventions, that the most useful discoveries are generally the result of accident. These columns have borne witness to a great number of individual cases of this kind. In the May number of Chambers' Journal, a writer says: Seldom do men sit down with a steady resolve, a determined purpose, to discover some new principle or invent some new process. When they do so, there is a lurking idea of the kind of thing they want, a dim perception of the direction in which success may most reasonably be sought. Generally speaking, something is concerned which, for want of a better term, we call accident. An appearance presents itself, or an effect is produced, which the observer neither designed or expected: an accident, certainly, so far as he is would be supposed that he would be powerless before an personally concerned. It may be a manifestation, until then his long-sought object would be pretty nearly attained

that glazed ware might possibly hit the taste of the public; he introduced the system of glazing by means of common salt, a system at once cheap, easy, and durable; and England has made many a million pounds sterling by the accidental discovery.

When maidens are doing their hair, an important element of daily duty in many a household, they may perhaps be gratified in learning that this process led accidentally to a very useful invention. Joshua Heilman, engaged in the cotton manufacture at Mulhouse, in Alsace, was long meditating on the possibility of inventing a combing machine for long-staple cotton. Brooding over the matter, he watched his daughters combing their hair, and noticed how they drew the long tresses between their fingers, alternately with drawing the comb through them. The thought struck him that, if he could successfully imitate by a machine this twofold action, so as to comb out the long fibers of cotton, and drive back the shorter by reversing the action of the comb,

Armed with this new idea, he set to work with renewed SIGNAL BUOY.-J. M. Courtenay, Cornwall, N. Y. cheerfulness, and invented a beautiful machine, which enabled him to comb cheap cotton into moderately fine yarn.

In 1720, a potter named Astbury was journeying on horseback from Staffordshire to London. Stopping awhile at Dunstable, he obtained assistance in regard to a weakness in the in the eyes of his horse. The hostler at the inn, making use of such bits of veterinary knowledge as he possessed, took a piece of flint, calcined it in the fire, pulverized it, and blew some of the powder into the horse's eyes. The change produced in the flint, by burning from a black stone to a white powder, struck Astbury with a new idea. Would it be possible to produce white flint ware, harder and more durable than white ware made wholly of clay? He collected a small stock of flints from the chalk hills of Dunstable, and took them back with him to Staffordshire. The result more than realized his expectations; powder of calcined flint, mixed with pipe clay, produced a most excellent ware, and established a new branch of the potter's art that took firm root in Staffordshire.

### Railway from Boston to the Summit of Mount Washington.

It is expected that the extension of the branch of the Boston, Concord, and Montreal Railroad, from the Fabian House to the base of Mount Washington, a distance of about seven miles, there connecting directly with the Mount Washington Railway, extending to the summit, will be completed and opened for public travel by the first of July, at which time passengers by this line from Boston can reach the base of Mount Washington without change of cars, and thence, by direct transfer to the cars of the Mount Washington Railway, reach the summit, making the entire distance by steam power. Passengers will thus be enabled to take their breakfast at Boston and their supper on the summit of Mount Washington at the usual hours of the same day, and without fatigue or the annoyance of change.

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# The Fast Train Across the Continent.

This remarkable enterprise ended triumphantly on Sunday, June 4, the train reaching San Francisco at 9:23 A. The total time from Jersey City to San Francisco was М. 83 hours 34 minutes, being 4 hours 26 minutes less than the schedule time, 88 hours. At 9:52, on June 4, the passengers ; under the bed, to be turned by hand or other means. alighted in the court of the Palace hotel, dusty and travelworn, but in good health and spirits. Engine No. 49 brought the train through from Ogden, with the assistance of an additional engine in crossing the Sierras. The time from Ogden to San Francisco was 23 hours and 52 minutes. The actual average running time from Ogden to Oakland wharf was 411 miles per hour. Considerable trouble was experienced on the Central Pacific from the wearing out of the brake shoes on the Pennsylvania cars; and in the mountains the Central Pacific Company put on two of their own coaches to brake the train. There was no accident of any kind throughout the trip. Shortly after arrival breakfast was served, to which prominent citizens, army and navy officers, representatives of the press and the theatrical profession, railroad officials, and the Mayor of the city were invited.

A salute of thirteen guns was fired from the roof of the Palace hotel on the arrival of the train at the wharf. The remainder of the day was devoted to needed rest. The excursionists were serenaded in the evening.

Inventions Patented in England by Americans. [Compiled from the Commissioners of Patents' Journal."

From April 25 to May 22, 1876, inclusive. ARTIFICIAL STONE .- W. H. Smith, Philadelphia, Pa. ATOMIZER.-T. J. Holmes, Boston, Mass. AxLE.-G. W. Miltimore, Jamesville, Wis. BLIND ROLLER.-S. Hartshorn, New York city. BOILER FLUE CLEANER.-A. Wiggin, Rye, N. Y. BOOKBINDING.-A. Hoyt, Brooklyn, N. Y., et al. BOTTLE STOPPER, ETC. - N. Thompson (of Brooklyn, N. Y.), London, Eng BRICK MACHINE .- W. L. Grigg, Chicago, Ill. CAB FARE INDICATOR.-M. Runkel, Golden Square, London, England. CALEFDAR, ETC.-M. H. Paddock, East Clarkson, N. Y. CAPSTAN.-J. H. David, Damaris-Cotta, Me. CASTOR.-L. P. Lawrence, Port Morris, N. J. CHARGING GAS RETORTS.-J. F. Rice, Louisiana, Mo. CLEANING SHIPS' BOTTOMS.-J. C. Seymour, New York city. COFFEE POT.-G. W. Hubbard, Windsor, Vt. CONDENSING EXHAUST STEAM.-J. F. Fifield, Brooklyn, N. Y. CUTTING MEAT, ETC.-W. H. Goodchild, New York city, et al. ELECTRO-MAGNETIC ENGINE.-L. Bastet, New York city. EXTRACTING JUICES.-L. F. G. Bouscaren, Cincinnati, O. FOLDING TENT, ETC.-F. A. Guthrie, Addison, O.

SOLVING PROBLEMS. -T. Hill, Portland, Me. STARCHING FABRICS.-T. S. Wiles et al., Albany, N. Y. TEAM COOKING VESSEL.-S. T. Goodwyn, New Orleans, La. STRAM ENGINE.-G. McNaughten, Brooklyn, N. Y. STEAM HAMMER.-P. B. Williams et al., Quincy, Ill. STEERING PROPELLER.-F. G. Fowler, Bridgeport, Conn. TELEGRAPHING SOUND .- E. Grav, Chicago, Ill. THREADING SCREWS, ETC.-C. D. Rogers, Providence, R. I. TREATING OIL REFUSE.-W. P. Jenney, New York city. TRIMMING CARDS.-V. E. Mauger, New York city TWISTING MACHINERY, ETC.-C. Fletcher et al., Providence, R. I. UMBRELLA, ETC.-H. Palmieri, New York city. WHEEL HARROW, ETC .- S. H. Weston, Winooski, Vt.

# Becent American and Loreign Latents.

### NEW MECHANICAL AND ENGINEERING INVENTIONS.

IMPROVED VALVE-GRINDING MACHINE.

William T. De Luce, Chicago, Ill.-This is an improved device for holding a valve upon its center while grinding it in its seat, which shall be so constructed as to enable the valve to be ground without detaching it from the pipe.

### IMPROVED RAILROAD SWITCH CHAIR,

Henry C. Fox and Joseph Hayward, St Joseph, Mo.-This consists of the base and web supports of the rails, extended up to and so fitted under the overhanging sides of the rail head that they are supported against splitting off and hammering down.

#### IMPROVED WATER MOTOR.

Israel F. Good, Goodsville, assignor to himself and Hiram F. Seiger, Orefield, Pa.—This invention consists of a series of buckets attached to a corresponding series of arms, some of which are made to rise with their buckets empty to an elevated tank by the weight of other descending filled buckets. The empty buckets are filled at the tank, and, in turn, raise the others, the excess of the weight of the filled buckets being applied to the performance of work.

# IMPROVED DEVICE FOR STARTING PENDULUM CLOCKS.

Ernest A. Lourdelet, Paris, France.-This consists in the application of an additional axis in any convenient position in the clock dial or its pedestal, which axis is squared at the end to receive a key or its equivalent. It also carries a lever arm whose extremity is made by partly rotating the axis to bear against the pendulum rod and set the latter oscillating.

### IMPROVED LEATHER-PUNCHING MACHINE.

Alonzo C. Ricke and Martin D. Norris, Eldora, Iowa.-This is a contrivance or device for punching leather straps of all kinds, but more particularly bars for leather fly nets for horses. It is adapted for punching either by movable or stationary punches and has a feed mechanism worked by a shaft fixed transversely

### IMPROVED STRAIN EQUALIZER FOR PULLEY ROPES.

Samuel Woolston, Vincentown, N. J.-This is a device for equalizing the strain upon the ropes of a number of sets of pulleys used together for moving heavy masses. It is so constructed as to enable all the ropes, or one or more of them, to be operated at a time without affecting the equalization of the strain among all of said ropes.

#### IMPROVED PIPE TONGS.

George M. Curry, St. Petersburgh, Pa.-Upon the forward end of the handle is formed a crosshead in which is formed a groove to receive a tenon formed on a curved and pivoted bar. The other end of the crosshead is concaved, and upon it is formed a tenon to enter a groove in the convex side of a pivoted semi-cylindrical jaw. Another jaw is similarly arranged on the inner side of the outer end of the hook first mentioned. The jaws have thus sufficient play to adjust themselves to the object to be grasped.

IMPROVED RELIEF APPARATUS FOR AIR COMPRESSORS. William F. Tallman, Mineville, N.Y.—This consists of a weighted valve, in connection with the cylinder of an air compressor, to be raised by the air when the pressure exceeds a certain limit. There is a piston to which the air is admitted by said valve, and raised so as to stop the action of the receiving values of the compressor. with which it is connected for that purpose. It thus prevents the increase of the pressure unduly. The weighted valve falls when the pressure of air diminishes and opens an escape for the air from the piston, which then falls and allows the valves of the compressor to act again. The relief apparatus may be made to work spe-cial valves on the compressor instead of the receiving valves.

### IMPROVED PAINTER'S WHEEL HORSE.

Albert D. Osgood, Oneida, Ill.-This is an improved horse for painting the wheels of vehicles of all kinds without necessitating the removing of the wheels. It admits the adjusting of the wheel into any position, takes up little room, and facilitates the work. It consists of a base support or stand, with revolving upper part, and an adjustable hub, supporting top arm, and thimble.

### IMPROVED ELEVATOR

Alfred B. Darling, New York city.-The first part of this invention is a contrivance whereby ropes may be used instead of chains for gearing the elevator corriage with the retarder, which is em-ployed to regulate the descent of the carriage. The ropes are claimed to be stronger, less noisy, and more easy in operation, and less wearing. The second part consists of the carriage connected to the hoisting drum by ropes, which wind off and on reversely to the accommodation of the hoisting ropes. The object is, first, to prevent the hoisting ropes from winding off faster than the carriage descends; and, second, to insure the descent of the carriage

#### IMPROVED WATCHMAKER'S LATHE.

Daniel M. Williams, Calvert, Tex.-This invention consists of a novel contrivance of a bed adjustable for varying the hight of the bed relatively to the centers for different kinds of work; also of an adjusting tail stock, and an attachment for cutting gear wheels and pinions, all of which will be found illustrated on page 194, current volume.

### IMPROVED PLAITING MACHINE.

Andrew J. Decker, Fond du Lac, Wis .- This consists of a series of removable needles in a couple of side pieces fixed in a base plate and perforated with numerous holes in a row, in which the needles can be readily put and removed. A clamping plate at one end of the apparatus is adapted for holding the cloth. The cloth is doubled around two or three or more of the wires for plaiting it, and the plaits are fastened by stretching it along the edges after being plaited. The wires are drawn out to release the plaits when completed.

#### IMPROVED PUMPING APPARATUS.

Wade Couts, Brownville, Neb.-This is a pumping apparatus so constructed that cattle may be made to water themselves. As the  $cattle \, step \, upon \, a \, treadle \, platform, their \, weightdraws down \, a \, rop \, e$ which, by suitable counterpoises, causes the pump to be operated.

### IMPROVED LIFTING JACK.

John Y. Thurston, Medfield, Mass.-This consists of a sliding ratchet bar operated by a spring-bolt lever, and retained by a safety spring pawl.

#### IMPROVED SPARK ARRESTER.

Waldo H. Jordan, New York city.-This is an uninclosed conical annular cap, to cover both the mouth of the chimney and the mouth of the cinder receptacle which is made around the chimney. The interior is provided with a parabolic deflecting surface that begins at the center of the shell, curves upward and outward, then downward to the outer edge of the shell. When the products of combustion rise, they impinge upon said deflecting surface, which serves to turn the solid particles, sending them down into the re-ceptacle which surrounds the chimney, while the smoke and gases pass laterally from the interior to the atmosphere.

#### IMPROVED PORTABLE SPRING POWER HAMMER.

Ray F. Livermore, Port Henry, N. Y.—This is a contrivance of a lever catch and tripping device, in combination with a hammer having a spring or springs for striking a powerful blow. The hammer may be easily handled by one man, and made to strike a powerful blow. It is designed for breaking large boulders of rock ores, iron, etc.

#### IMPROVED LIFTING JACK.

George G. Howe, Faribault, Minn.-This consists of legs pivoted brace link of the outer leg, to retain the lever in hoisted position.

### IMPROVED CAR COUPLING.

Jabez B. Meadley, Davenport, Iowa.-This is a contrivance of spring jaws for opening and receiving the link and securingit selfactingly, together with a cam, chain, and crank, whereby the jaws can be opened from the top or side of the car.

### IMPROVED HYDRANT.

John T. Davis, Washington, D. C.—This invention relates to an improvement in the construction of the casing of the hydrant and the construction of the valve mechanism with the plug of the service pipe, also to the provision of a stopcock within the casing, whereby the water may be conveniently shut off at the hydrant itself, and the valve mechanism readily removed, for repair or other purpose, and whereby other operations incident to keeping a hydrant in proper condition may be effected without the necessity of digging up the casing.

#### IMPROVED ROTARY ENGINE.

Josephus Moore, Mound Valley, Kansas.-This consists of a pair of cylinders, with pistons set opposite each other for one to take steam when the other is not taking it. Abutments slide out and in to let the pistons pass, and are worked by cam disks out-side of the cylinders. Two sets of slide valves are provided, for running the engine either way, the valves being worked by eccentrics on the shaft, outside of the case. There are two sets of exhaust ports for use according to the way the engine runs, the valves of which are connected to the reversing valves, so as to shift simultaneously with them. The steamways are constructed in the form of a ring, and the pistons are in the form of a segment of a ring, and are attached to the edge of a disk keyed on the shaft, so as to be fitted with ordinary round piston packing.

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# NEW CHEMICAL AND MISCELLANEOUS INVENTIONS.

#### IMPROVED MAIL BAG.

John Boyle, New York city.-The object here is to construct the mail bags that are taken up by the catchers of mail cars in such a manner that they may be more easily and securely taken hold of by the catches without danger of being dropped. The invention consists of a mail bag made with a narrower and contracted throat at the middle part, and provided with a detachable protecting sleeve.

DEVICE FOR REMOVING WIRES FROM BOTTLE CORKS. John Franz, Croton Falls, N. Y.-A crotched brace arranged in a handle is placed around one side of the neck of the bottle and under the wires. A forked claw engages the wire at the top of the cork and pulls it off by pressing the handle down.

### IMPROVED DENTAL PLUGGER.

FORK, ETC.-Brown Brothers Co., Waterbury, Conn FOUNTAIN LAMP.-R. H. Webb, Brooklyn, N. Y. GAFF FASTENING .- J. H. David, Damaris-Cotta, Me. GAS EXTINGUISHER .- V. N. Taylor et al., Springfield, Mass. GLOVE FASTENING, ETC.-F. G. Farnham, Hanley, Pa. HAND STAMP.-G. K. Cooke, New York city. HARVESTING MACHINE.-S. Johnston, Brockport, N. Y. HYDRAULIC DREDGE, ETC. - W. II. Newton, Chicago, III. IRONING MACHINE. - T. S. Wiles *et al.*, Albany, N. Y. KITCHEN SAFE .- G. W. Bollen bacher, Bloomington, Ind. KNITTING MACHINE, ETC.-C. J. Appleton, Elizabeth, N. J. MAKING PAPER PULP .- J. W. Dixon, West Manayunk, Pa. MAKING TEA, ETC.-J. Miller, Himrod's, N. Y. PAPER-CUTTING MACHINE.-J. Vanhorn et al., Brooklyn, N. Y. PIN.-H. M. Jenkins et al., New York city. PISTON PACKING, ETC.-J. T. Wright et al., Dayton, Ohio. PREVENTING FALLS IN SKATING .- J. T. Parlour (of N.Y.), London, Eng. PRINTER'S GALLEY .- J. F. Hannan, New York city. PROJECTILE .- N. Wiard, Washington, D. C. PROPELLER.-F. H. B. Babbe, Antioch, Cal. RAILWAY, ETC.-R. Stone, Vandalia, N. Y. RAILWAY SWITCH AND SIGNAL.-D. ROUSSEAU et al., New York city. SACK-SEWING MACHINE.-J. S. Hall, Monterey, Cal. SASH FASTENER.-N. Thompson (of Brooklyn, N. Y.), London, England. SASH FASTENER.-W. A. Hopkins, New York city. SCREW, ETC.-C. D. Rogers, Providence, R. I. SCREW, ETC.-E. A. Leland, New York city. EELF-CLOSING VALVE,-E, W. Lippert, Cincinnati, O., et al,

#### IMPROVED GANG PLANK.

George Malone, Memphis, Tenn.-This is a ladder of ropes and cross pieces, in combination with the stage plank of a steamer, in such manner that it can readily be removed for sliding freight on and off the boat, and is readily applied again to afford foothold for passengers. The said ladder is also applicable for a fire escape.

### IMPROVED ADDING MACHINE

David Carroll, Spring Creek, Pa.-The essential feature of this arrangement is a contrivance of a key for each of the figures of the nine digits, arranged for two to be worked by each finger of the left hand, and one by the thumb. Each key turns the unit wheel the number of figures that it stands for.

#### IMPROVED CHUCK FOR HOLDING METAL DRILLS.

William Frost, New Bedford, Mass.—This consists of a sliding jaw having a triangular notch and a couple of toothed jaws fixed to slide at right angles, and arranged in said notch. These are toothed, so that one meshes in the other, and have a spring between them, the mandrel, and is so contrived that round, square, or other shapes, either taper or straight, may be held with like facility.

### IMPROVED BLACKSMITH'S FORGING HAMMER.

John Koplin, Reed's Landing, Minn.-This is a new arrangement. and springs,

Cassius M. Richmond and Alexander Warner, Jr., San Francisco. Cal.-The mallet is mounted by a spring on the upper end of a tubular stock adapted for receiving different tools. A cam mounted on a revolving shaft, arranged parallel to the stock, lifts the mallet, and the springthrows it back against the head of the tool to strike the blow. The frame in which the cam shaft runs is mounted on the tool stock, so that the latter has a little endwise motion in the frame for allowing the tool to reciprocate, and a spring in the stock, beneath the head of the latter and the frame, raises the tool after being forced down by the hammer. A joint in the frame of

the cam shaft allows the cam to be adjusted so as to strike light or heavy blows, as required.

### IMPROVED COMBINED GAS AND CHANDELIER.

George P. Clark, Newton, Mass.-This is a contrivance of oil burners, in the center portion of agas chandelier. It will be found fully described and illustrated on page 371 of our current volume.

#### IMPROVED TWEER.

Thomas F. Witherbee, Port Henry, N. Y.-This consists of a parfor opening them. All are arranged in a stock which is attached to tition in the water chamber between the inlet and outlet pipes, to compel the water for cooling the tweer to pass entirely around it.

### IMPROVED SHOE.

John C.Weil, Baltimore, Md.-This consists of a secondary insole, held in position by tags of muslin secured between the outcole and of apparatus whereby a sledge hammer is worked by a foot lever insole, and pasted down. The idea is to make the shoe easier to wear and less heating to the foot.