

THE SPIDER CRAB.

To those who have sailed along our coast to enjoy the sport of "blue fishing," and have whiled away a few spare moments in the contemplation of the various forms of marine life, the object represented in our plate will not prove unfamiliar; and were the animal divested of its ornamentation of sea weeds it would prove no less familiar to those who frequently stroll along the beaches of Coney or Staten Island, or of the Atlantic coast generally, where the empty shell of the dead animal is rather a common object.

This unpromising looking creature is a species of long-legged crab, familiarly (and rather aptly, too) called the "sea spider" or "spider crab," and is of an aspect scarcely less disagreeable than that of the terrestrial spider. In fact the crab, which, like the latter, belongs to the great branch of the animal kingdom, the *Articulata*, occupies a position among crustaceans equivalent to that held by the spider among other articulata. In their youngest stages crabs undergo a true metamorphosis no less striking than that of insects. The young of the crustacea are so wonderfully mimicked by the degraded forms of the young of spiders "that the two forms would seem at a casual glance hardly to belong to different genera, and the two great groups seem to run into each other here, so that their limits are scarcely distinguishable, and we only know that one is a young spider, and the other a young crustacean, by tracing their life history further on." The young in this larval condition were long ago described under the name of *zoëa*, and it is still called the *zoëa* stage. After casting the skins several times and increasing in size, the young crabs assume the "megalops" stage. Finally, at one casting of the skin the swimming legs disappear, and the little crab comes forth something like the adult form. Most of the species undergo similar changes.

The spider crab (*Libinia canaliculata*) of our Atlantic coast has a somewhat pear-shaped body, and exceedingly long legs, often spreading more than a foot across. Its back is covered with spines and tubercles. The eyes, like those of many of the crustaceans, are borne at the extremity of movable pedicles, and thus they may be turned in every direction without moving the whole body at the same time. Such a provision as this is not necessary in insects, owing to the mobility of the head of these animals; but is absolutely indispensable in the case of crabs, where the head and thorax being consolidated into one mass, the extent of vision commanded by sessile eyes would have been extremely limited, and inadequate to the security of creatures exposed to such innumerable enemies.

The long legs of this animal remind us somewhat of those of the spider; the two anterior members are armed with slender, feeble claws only, for the animal is neither rapacious nor combative like other crabs. It will be readily seen that its defense can only be a passive one, and it is for this reason (that is, for purposes of concealment) that its shell is usually so luxuriantly adorned. In fact, the spider crab is almost always hidden among stones and seaweeds at the bottom, while other crabs frequent the shore and are continually in search of prey.

We have often fished up these creatures from the ocean and found them covered with mud, barnacles, seaweeds, and other substances which tend to conceal them from their enemies. In some foreign aquaria, where the habits of these crabs have been noted, they have been seen to seize seaweeds and polyps and place them upon their back, having first spread upon them a viscid saliva secreted by their mouth, in order to make them adhere. Seaweeds thus placed seem to grow as luxuriantly afterwards as if they had not been transplanted. Some foreign species, on the contrary, have been observed (in aquaria at least) to be entirely destitute of this artificial covering, and have been seen for hours at a time carefully cleaning themselves with their long claws, and performing the operation with all the grace of a cat. They make use of their delicate claws, which appear so awkward, to carry food to their mouths, and are able, with such imperfect hands, to pick up the minutest morsels.

The habits of this animal were well known to the ancients, and by them this crustacean was made the emblem of wisdom. Its image was suspended to the neck of Diana of Ephesus, as of a being endowed with reason. It figured also on the money of Ephesus as well as on that of several others of the shores of Asia. The ancients also regarded the crab as sensible to the charms of music, an opinion not con-

firmed by modern experience, and probably an extension of the idea that attributed such a gift to the terrestrial spider.

The spider crab represented in our figure, is a common species of the Atlantic Ocean.

Chances for Enterprising Americans.

Encouraging reports are received constantly of the efforts made by Philadelphia to open up the Mediterranean coast to American trade. A gentleman of commercial prominence in Russia gives as his opinion that when the present war-like cloud has passed away American manufactures will begin to make serious headway in the Russian markets. Another correspondent believes that the Americans might enter into successful competition with the German, French, and English dealers who now control the Italian market, while natives of other countries suggest that much good might result from a distribution over the Continent of catalogues of American goods, printed in the language of the various countries proposed to be covered.

Several large contracts are now open in different parts of the world to which our American capitalists, if they take time by the forelock, might turn their attention with profit both to themselves, their workmen, and the country at large.

On the Continent the Lisbon and Entrocamento Railway is about to place an order for nearly 20,000 tons of steel rails.

while the Queensland government desires one from the north of Queensland to Singapore. The Messrs. Sieman Brothers, of Germany, have made a bid of \$3,500,000 for this latter contract, but the offer has been officially declined. The merchants of New South Wales are also bestirring themselves to obtain a duplicate cable to Europe. Several routes have been suggested, including one from the Northwest Cape to San Francisco. This would cost about ten millions of dollars. Any company which would take the matter up is guaranteed an annual subsidy of \$375,000 by the New South Wales Government.—*Philadelphia Record*.

New Inventions.

M. Egidi Moog, of Oggersheim, Bavaria, Germany, is the inventor of an improved Clearing Attachment for Carding Machines, which is designed to be placed in the space between the top cards, doffer, and main cylinder of the machine, for acting on the surface of the cylinder.

Mr. Henry Tibbe, of Washington, Mo., has patented an improved Pipe made of corn cob, in which the interstices are filled with a plastic, self-hardening cement. The stem is connected with the head by being fitted upon a central tube, extending through and secured in the bottom of the pipe head, said tube being provided with a side perforation communicating with the socket of the pipe head.

Mr. Robert Roberts, of St. Joseph, Mo., has patented an improved Cigar Machine for making cigars by first feeding the filling and binder or inside wrapper to suitable moulds and cutting shears, and exposing them to a pressure that reduces the bunch to a size smaller than the proper size. The pressure then eases up, so that the bunch can be fed forward to receive the wrapper, the point being finally finished by hand.

An improved Electric Gravity Escapement for Pendulums has been patented by John F. Pratt, of San Francisco, Cal. The object of this invention is to provide an improved gravity escapement for pendulums of clocks, so as to impart an impulse when near the center of its arc by gravity alone, independent of the force of the electric current, while leaving the pendulum free from all resistance or interference during the remainder of its oscillation.

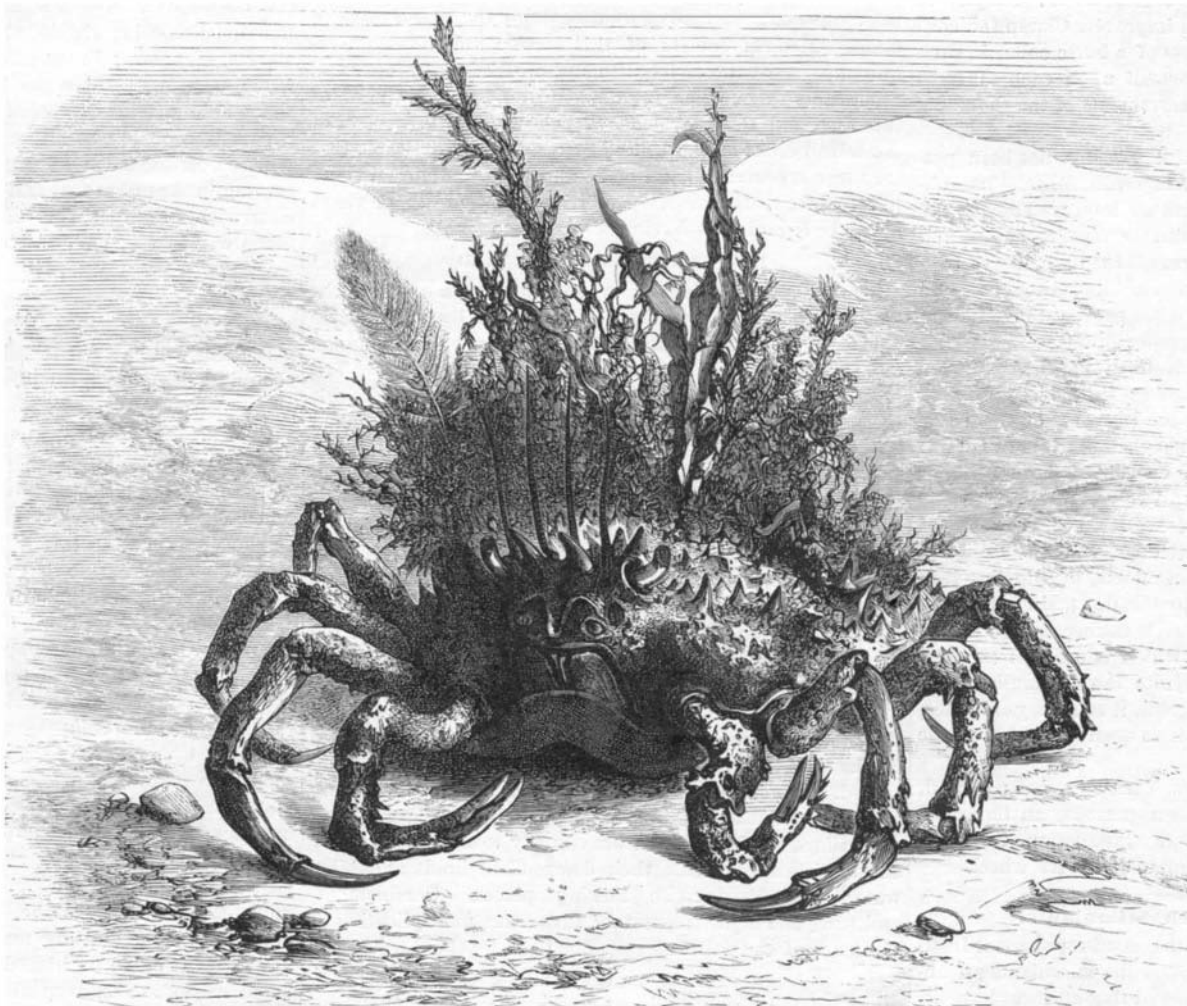
An improved Machine for Giggling Designs on Cloth has been patented by Max Strakosch, of Brunn, Austria. The invention consists of a vertically adjustable drawing cylinder, over which the cloth is stretched, in connection with a stencil plate of any suitable design, passing in arc shape over the top of the cylinder, and with a revolving and forward-and-backward reciprocating giggling cylinder, that is applied to the cloth when the drawing cylinder is raised by suitable mechanism, so that the giggling cylinder can act upon the portions of the cloth exposed by the stencil plate. The giggling cylinder is taken off the cloth when the drawing cylinder is lowered, and then the latter is turned by intermittingly working mechanism, so as to draw the cloth forward for the length of the stencil plate, and expose the cloth successively to the action of the giggling cylinder.

Susan M. H. Pennington, of Evansville, Ind., is the inventor of an improved Process of Coloring Photographs, which consists in first immersing the photograph in a clearing solution of rosin and paraffin, each previously dissolved in turpentine, and then applying to the face a coat of rosin dissolved in alcohol, and to the back a coat of the clearing solution.

Mr. Edwin C. Haviland, of Sydney, New South Wales, has patented an improved Pencil, which may contain lead of different colors or of different degrees of hardness, any one of which may be brought into use whenever required. It consists in the combination of a pivoted barrel with a holder for the leads, and a stop for retaining the holder in any required position.

Mr. Simson S. Henderson, of North Washington, Ohio, has patented a Device to Receive and Hold a Quid of Tobacco when in the mouth, the use of which will prevent an intemperate use of tobacco, while at the same time affording the chewer the full pleasure, enjoyment, and satisfaction which the use of tobacco imparts.

Mr. Othniel J. Smith, of Wauwatosa, Wis., has patented an improved Whiffletree Hook, by which the trace may be quickly inserted and retained reliably on the hook, and by which the trace is prevented from unhooking itself.



THE SPIDER CRAB.—(One half natural size.)

The company can be addressed at Lisbon. In Italy two railroad enterprises are under consideration: one for the construction of a line from Airasca to Saluzzo and Coni, and the other from the latter place to Mondovi, both in Piedmont. For information the Italian Minister of Transportation can be addressed.

In Spain the Cortes is considering the desirability of constructing a line from Mollina to Caldas de Mombuy, and the government also proposes to construct a line from Pontevedra to Redondela, to connect with the road from Tuy to Vigo. The national government is being urged also to construct a branch line from Puente de los Fierros to Pola de Lena, and another from Busdonjo to the tunnel of Arbas. In London, also, the Southeastern Railway Company is about to place an order for a number of goods engines and bogie carriages.

Opportunities to bid for contracts are rife in Mexico. A bridge is to be constructed over the river Lerma, as a step toward developing trade between the States of Michoacan and Guanajuato. A railway is to be built between Puebla and Izuero de Matamoros. A rolling mill for railroad iron is to be started at Morelia, and a paper and cotton mill at San Miguel de Allende. The State Government of Tamaulipas has been authorized to construct a railway and telegraph from Tantoyuquita, or some other point on the Tamesi river, to the city of Valle del Maiz, on the boundary between the States of San Luis Potosi and Tamaulipas.

Other opportunities present themselves in still more distant parts of the world. In Bolivia the Executive has been authorized to construct a railroad from Salintas to Caracoles. In Yucatan, Central America, another line is to be constructed between Merida and Peto. In Western Australia a light cable is wanted between Fremantle and Rotnest Island,

An improved Measuring Pump has been patented by Mr. Tilghman R. Vestal, of Fall River, Mass. This invention relates to an instrument for drawing liquids or gases, either for measuring, bottling, or other purposes, which has the advantage that any desired quantity may be measured off quickly and accurately by the use of one vessel only, without exposing the liquid to dirt and flies, the liquid being finally dropped directly into the receiving receptacle.

Mr. Andrew Zerban, of New York city, has patented an improved Mode of making up Combinations of Colors for Patterns of woven and printed goods, which consists in arranging for selection differently colored samples for observation through the holes of a perforated sheet of the given ground color.

An improved Refrigerator has been patented by Mr. James W. Lawrence, of New York city. The object of this invention is to furnish ice houses for the use of butchers, provision dealers, and others, which shall be so constructed as to produce a colder temperature than is possible to be produced with ice alone, and which at the same time will prevent the ice in the bunker or ice chamber from melting.

Mr. Marcus M. Kendall, of Leavenworth, Ind., is the inventor of an improved Measuring Can and Faucet, by which any desired quantity of liquid may be conveniently and quickly measured off from a receptacle or vessel by merely setting the faucet to its proper place on an indicating dial, the faucet serving also for the purpose of refilling the can when the contents of the same have been measured out.

Messrs. Joseph P. Schmitz and Herbert W. Cooper, of Winona, Minn., have devised an improved Clamp for connecting the lower ends of the parts of a horse collar in such a way that they may have a movement upon each other to accommodate themselves to the movements of the shoulders of the horse in walking.

An improved Fastening for Hat Elastics has been patented by Mr. Moses K. Hoyt, of Haverhill, Mass. The object of this invention is to furnish an improved device for securing the ends of an elastic cord or tape to ladies' and children's hats and bonnets, to prevent the necessity of sewing the ends of the elastic to the hat every time the said elastic wears out or breaks, and thus prevent the hat from being injured by so much sewing and ripping.

Mr. Samuel R. Bryant, of Waterford, Pa., has patented an improved Apparatus for Cooling Milk, or for heating the same, as may be required for the purposes of the dairy. The apparatus is so constructed that the milk is between two water holders, and is thus rapidly cooled. It has a peculiar arrangement of discharge tubes and valve.

Mr. Levi G. McCauley, of West Chester, Pa., has patented an improved Gas Regulator for Retorts, which is designed for relieving the pressure of gas in retorts, by allowing it to escape more rapidly into the hydraulic main when the pressure increases. The apparatus is connected and co-operates with a steam jet exhauster, which is used for exhausting retorts and forcing the gas into the hydraulic main. When the pressure of gas is too great, it raises a gas holder, and thereby causes a pivoted lever to open the valve of the steam exhauster.

Mr. Julius H. Hollweg, of New York city, has patented, for the use of children and grown persons, an improved three-wheeled velocipede of simple construction, in which the front wheel serves both as a guide and drive wheel.

Ancient and Modern Stimulants.

In a paper read before the British Anthropological Institute, Miss A. W. Buckland described the stimulants of ancient and modern savages, and showed that all races have acquired the use of them in some form. The stimulants of the lower races, such as the Australian, consist merely of leaves and roots, chewed for their strengthening and invigorating properties, this being only a slight advance upon the instinct which prompts the inferior animals to seek out certain plants for medicinal purposes. The first step towards the manufacture of stimulating drinks is seen in the kava of the South Seas. This art of producing fermentation by the masticating process can be traced in a line across the Pacific from Formosa, where rice is the ingredient thus employed, to Peru and Bolivia, where maize is used for the same purpose, the manufacturers being always women. The next advance is that acquired by agricultural races, who make a kind of beer from the chief cereal grown by them. This liquor probably reached Western Europe from Egypt, where it was very early known, through the lake dwellers, and still forms the principal drink of all African races. Pastoral tribes, meanwhile, use the milk of their flocks and herds and the honey of wild bees in the manufacture of their fermented drinks: hence the celebrated *koumiss* and mead of Scythic nations, the same liquors reappearing among the Kaffirs in South Africa, the vessels used in both countries being the skins of animals, which were also used for storing wines in the East. Later, in Greece and Rome mead was a favorite beverage of the Scandinavians and Anglo-Saxons, and there seems to be a shadow of the Scythic *koumiss* in the Devonshire liquor known as white or grout ale, while both liquors may be traced more distinctly in the famous *amrita* and *soma wine* of the Vedas. Various plants and fruits have been used in all civilized and semi-civilized countries from very ancient times in the manufacture of wines; but grape juices had formerly a circumscribed range, having been confined to Western Asia, Egypt, Greece, and Rome, but forbidden in China and the vines extirpated. The religious ceremonies and prohibitions attached to these various beverages were briefly noticed, as also the deification of

plants on account of their medicinal properties, and the form and material of drinking vessels; while alcohol, the latest and most pernicious development of the art of manufacturing stimulants, was only mentioned as not having been included among the beverages of the ancients nor known to savages until introduced by Europeans.

Yellow Fever and its Treatment.

The following directions to the medical officers of the Marine Hospital service have just been issued:

OFFICE SURGEON GENERAL,
MARINE HOSPITAL SERVICE,
WASHINGTON, D. C., August 15, 1878.

To Medical Officers of the Marine Hospital Service:

As several of the medical officers of this service have been called upon by the civil authorities to take charge of vessels supposed to be infected with yellow fever and to assume other responsibilities under the National Quarantine act, it is proper to state that the quarantine law was enacted too late for Congress to make an appropriation for carrying it into effect this year, though by personal exertion everything is being done which is possible without the expenditure of money. The strictly executive duties which the act imposes on the surgeon general of the Marine Hospital service have reference to external quarantine to vessels coming to ports of the United States from without. The act expressly provides that this office shall not interfere with or impair any sanitary or quarantine laws or regulations of the States or cities, which may be interpreted to refer especially to land quarantines and the health rules of cities. Medical officers of this service are, however, required to assist the civil health authorities in all proper and practicable ways, when requested to do so, and in view of this fact, and the prevalence of yellow fever in several of the inland cities of the United States, it seems desirable that the surgeon general should make known his individual views in reference to the disease and its prevention—these views not to be regarded as having official force.

HOW THE FEVER IS PRODUCED.

The weight of scientific evidence seems to warrant the conclusion that yellow fever is produced by an invisible poison, capable of self multiplication outside of the human organism, which it enters through the air passages. The poison germ or miasm is a product of the tropics. In this country yellow fever has prevailed in most of the Gulf and Atlantic cities, and in many of the towns along the Mississippi river. In some instances it has been carried inland with the people fleeing from infected localities, but it has never shown a disposition to spread epidemically at points remote from the continuous water roads of commerce, or to lodge in high salubrious places. The cities of the great lakes have always been free from the disease. Yellow fever cannot be said to be epidemic in the United States, from the fact that in some years it does not appear, though the imported germ undoubtedly survives the mild winters.

It appears to have about as much resistance of cold as the banana plant. When the banana stalk is killed down by the frost the yellow fever does not recur until again imported. The germ is transmissible. It is capable of being transported in the clothing or personal effects of passengers and sailors, but its spread from one city to another is chiefly accomplished by vessels, their damp, filthy holds and bilge water being its favorite lurking places. Confinement, moisture, and high temperature favor the multiplication or virulence of the poison.

USE OF DISINFECTANTS.

When a wharf or spot of ground or house becomes infected the poison at once commences to spread, creeping slowly in all possible directions, continually enlarging the area around the center of infection unless checked by disinfection, as had undoubtedly been done by the use of carbolic acid in New Orleans in former outbursts. Yellow fever is not communicated from the sick to the well, the sick and well being dangerous only as possible carriers of the poison germ or miasm. In support of this assertion it may be stated that at quarantine hospitals, where the effects of yellow fever patients are burned or otherwise thoroughly disinfected before the admission of the patients, the attendants do not contract the disease. This has been demonstrated many times. All well persons whose effects have been disinfected may be considered harmless after six or seven days have elapsed from the time of leaving an infected district or vessel, as the period of incubation of the disease lasts from two to six days. This simplifies the question of quarantine, absolute land quarantines being deemed impracticable, and indicates the direction of preventive measures to the vessel, cargo or the locality, if the poison has found lodgment on shore.

HOW VESSELS MAY ESCAPE.

A vessel may escape infection if kept clean and dry, and all parts capable of being closed are frequently subjected to the fumes of burning sulphur, and the men employed on board are compelled to bathe and change their flannels daily, and not allowed to sleep on deck or in the hold of the vessel. There is an example of a ship trading between Havana and New York upon which these precautions have been enforced for a period of twelve years, and not a single case of yellow fever has occurred on board. Though not sufficiently demonstrated to state as fact, still there seems good reason to believe that much may be accomplished by individual prophylaxis—by the use internally of small doses of sulphate of quinia at regular intervals and of tincture of

iron or of chlorate of potassa. As the poison enters the system through the air passages, it has been suggested that the nasal passages be bathed frequently with a solution containing quinine, to be applied by means of a nasal spray.

JOHN M. WOODWORTH,
Surgeon General United States Marine Hospital Service.

ASTRONOMICAL NOTES.

BY BERLIN H. WRIGHT.

PENN YAN, N. Y., Saturday, September 7, 1878.

The following calculations are adapted to the latitude of New York city, and are expressed in true or clock time, being for the data given in the caption when not otherwise stated.

PLANETS.

	H.M.		H.M.
Venus rises.....	3 41 mo.	Uranus rises.....	4 26 mo.
Jupiter in meridian.....	8 52 eve.	Neptune rises.....	8 36 eve.
Saturn in meridian.....	1 02 mo.	Neptune in meridian.....	3 26 mo.

FIRST MAGNITUDE STARS, ETC.

	H.M.		H.M.
Alpheratz in meridian.....	0 57 mo.	Procyon rises.....	2 09 mo.
Mira (var.) rises.....	9 17 eve.	Regulus rises.....	4 12 mo.
Algol (var.) in meridian.....	3 55 mo.	Spica sets.....	7 34 eve.
7 stars (Pleiades) rise.....	9 08 eve.	Arcturus sets.....	10 14 eve.
Aldebaran rises.....	10 22 eve.	Antares sets.....	9 34 eve.
Capella rises.....	7 50 eve.	Vega in meridian.....	7 25 eve.
Rigel rises.....	0 33 mo.	Altair in meridian.....	8 37 eve.
Betelgeuse rises.....	0 18 mo.	Deneb in meridian.....	9 29 eve.
Sirius rises.....	2 34 mo.	Fomalhaut in meridian.....	11 42 eve.

REMARKS.

Regulus and Uranus are still close companions, Uranus being three fourths of a degree south and about one degree east of the star. Venus is nearly "full," 0.91 of her illuminated disk being visible; she is fast approaching Uranus and Regulus, being in conjunction with Regulus September 13, 0h. 30m. mo., and as she is advancing among the stars, she will be a trifle east of Regulus at the time of rising. This will probably be an occultation in England. Saturn will be near the moon September 12, their conjunction occurring in the afternoon, and when first seen in the evening Saturn will be a little west of the moon. Jupiter and the moon will be very close September 7.

ERRATA.—In Astronomical Notes, August 10, "Jupiter will be near the moon August 17," should have read August 11.

"There will be a partial eclipse of the moon August 16," should have read August 12.

New Mechanical Inventions.

Mr. William P. Borland and Herman Hoffmann, of Leavenworth, Kan., is the inventor of an improved Adding Machine, which enables the user to add up a column of figures quickly and accurately, and without it being necessary for him to look at the machine, so that no time is lost in looking from his machine to the column of figures to be added.

Mr. Alfred H. Crockford, of Newark, N. J., is the inventor of an improved Bit Clamp, by which the bits may be centered and firmly clamped. The invention consists of a socket that is open at one side, and provided with an interior recess corresponding to the enlarged end of the bit shank, which is clamped by a centering screw at the upper end of the socket, so as to bear by a conical bottom recess on the conically tapering end of the shank. An angular offset in the handle of the stock prevents the contact of the hand with the clamping and centering screw.

Mr. John J. Crall, of Linn Creek, Mo., has patented an improved Quilting Machine. The object of this invention is to improve the quilting machine for which letters patent have been granted to him, dated August 7, 1877, and numbered 193,852, so that the stitching of the quilts may be accomplished more rapidly.

Mr. Albert H. Carroll, of Baltimore, Md., has patented a Bobbin Supporter for Spooling Machines. This invention is an improvement on patent No. 159,053, in which two loosely suspended arms are employed to embrace the bobbin, and, by pressure on its sides, cause the desired tension and draught on the yarn. The invention consists in applying a weight to the pivoted arms so that they are pressed toward each other and the tension of the yarn increased and made more uniform. The weight is a rectangular plate having slots to receive the pivoted arms, so that the weight slides downward and continually adjusts itself thereon, as the bobbin varies in size.

Steam Colliers.

The Philadelphia *Evening Bulletin* gives a detailed account of the Philadelphia and Reading Railroad Company's fleet of steam colliers, and how their operations are carried on. The fleet now comprises fourteen iron steamers, from 500 to 1,650 tons carrying capacity (only four falling below 1,025 tons), specially constructed for carrying coal. During 1877 they made 526 voyages, running 483,236 miles, and carrying 602,496 tons of coal. From the first, 1869, the fleet has run over 2,000,000 miles, delivering 2,099,036 tons of coal.

Some of these colliers have at times made trips to almost every port along the coast from Portland to Aspinwall, but the greater portion of the trade is with ports between New York and Portland. The average speed of the steamers is about ten miles per hour.

The Pottsville, it will be remembered, made a voyage to Havre last spring to take the exhibits of the Philadelphia and Reading Railroad Company for the Paris Exhibition. She made the run in sixteen days, and her engines were never slowed or stopped during the trip. It was found that as a coal-carrying vessel she was much superior to the English colliers.