## Notable Feat of Bridge Moving

A notable engineering feat was performed a few days ago by the substitution of a new 500 -ton drawbridge for an old and much lighter one where the Pennsylvania Railroad tracks pass the Passaic River near the Market Street station, Newark, N. J. The actual substitution of one bridge for another was made in eighteen and one-half minutes. The old drawbridge, which was built in 1868, was 213 feet long. The river at this point is 400 feet wide. At both sides of the river stationary spans are at the ends of the draw. The delay of traffic is, of course, most serious on a railroad like the Pennsylvania. It is easy enough to rebuild stationary parts, even where trains run over them every few minutes, but the substitution of one drawbridge span, weighing some hundreds of tons, for another, was a serious and interesting problem. When open the ends of the draw rested on fenders, which protect the structure from injury by passing boats. The engineers lengthened these fenders up and down the river until it was 250 feet long and capable of sustaining the weight of the draw. The new draw was erected on the southern fender, and it rested on eight railroad tracks, which in turn rested on rails. The space between the fenders and the central pier of the draw was filled with piling and capped with rails. Sunday was selected as the best day for doing the work, as then the traffic is the lightest. When the time came for moving, jacks were put under the old draw, and it was lifted clear of its pivot and raised to the level of the new one, and the two were lashed together with wire rope. Powerful hawsers were roved between blocks from the upper end of the old bridge to the drums of two stationary engines, which were started a few minutes after traffic was stopped. In eightminutes the old bridge was clear of its structure and moved onto the upper extension of the fender, and in another ten minutes the pivot of the new bridge was exactly over the socket, and in half an hour more the new bridge had been lowered on this pivot and the gear by which it is worked from an engine over head had been fitted. The actual substitution of one drawspan for the other was made in eighteen and onehalf minutes.

## Repairs to the "Ruffalo."

Repairs have been begun on the cruiser "Buffalo" at the Brooklyn navy yard. When they are complet ed, the vessel will be an excellent addition to the navy She will be fitted for special transport duty between

New York and Manila. The entire interior of the vessel will be remodeled and many improvements will be added. The engine room will be refitted and regular man-of-war quarters will be added. An ice machine will be introduced, and a larger evaporating plant has been purchased for the vessel. About $\$ 40,000$ will be spent in these improvements, so that the ship will be worth at least $\$ 700,000$. She will be painted white and fitted with a number of modern guns. We have already, on other occasions, given the history of this vessel.

## Automobile News

An automobile club is to be formed in Philadelphia. Steam wagons are to be employed in hauling borax in Oregon.
According to The Motor Car Journal, the Austrian Ministry of Commerce is reported to be contemplating the introduction of motor cars for the conveyance of mail bags to and from the railway stations as well as for the delivery of parcel's post packages and the collection of letters from the pillar boxes.
The Matin's nine-day automobile race around France terminated at St. Germain on July 24. The winner was M. Réné de Knyff, a Belgian, who covered the distance ( 1,428 miles) in 44 hours, 44 minutes, 9 seconds, or at an average speed of about 32 miles per hour. In many parts of France the country was hilly and sometimes mountainous, and the carriages provided with the greatest horse power showed themselves to special advantage in hill climbing.
Mr. and Mrs. Davis have, owing to accidents to the machinery of their automobile, only reached Syracuse. The trip will be continued July 29.
Messrs. Haynes \& Apperson, builders of an automobile of the same name, are making a trip from Kokomo, Ind., to Brooklyn. No attempt at fast time is being made and the average speed is fourteen miles per hour.
The automobile show at the Tuileries Gardens, Paris, has been very successful, and the number of vehicles shown has been very large and the exhibits are valued at over half a million dollars. The electric vehicles are particularly in evidence. Many of the French vehicles seating from two to three people rose in price from $\$ 700$ to $\$ 1,200$.
In France automobile accid יnts are becoming many and serious, and, unfortunat iy, the victims are usu-
ally the automobilists themselves. The former mayor
of Ay, M. Bollinger, was riding in his automobile down hill: they were going at a pretty good pace when the brakes failed, and suddenly the carriage, for some un accountable reason, turned completely over, all the passengers being thrown underneath the vehicle, $M$. Bollinger was instantly killed and the others were seriously injured. In Belgium a well-known sportsman ran over a child with his motor cycle, broke the child's arm and leg, and he received a fractured skull. M. Pierre Giffard, an authority on the subject, attributes the alarming and constantly lengthening catalogue of accidents to excessive speeds which the drivers give their carriages.

## The current supplement.

The current Supplement, No. 1231, has many arti cles of unusual interest, the most important being "Geodetic Work in Spitzbergen," by Prof. J. H. Gore, an illustrated article of great interest. "Microbes in Co-operation" is by G. Clarke Nuttall. "New French Automobile Fire Engine" is described and illustrated with drawings, giving details of the mechanism. The usual "Trade Suggestions of the United States Consuls," "Miscellaneous Notes," "Selected Formulæ and "Trade Receipts and Suggestions" are published. "Building Railways in the Field by the Railway Corps of the German Army" is an illustrated article showing how soldiers build railways in fields. "The Electric Tramway of the City of Tours" describes the Diatto system. There is also an interesting article on "The Nuraghi of Sardinia and Similar Structures." These aretowers which compare in interest with the famous round towers of Ireland. They are of enormous size, and there are more than 3,000 on the island. "Some Experiments in Making Rubber Substitutes" is an interesting technical article.


## RECENTLY PATENTED INVENTIONS.

## Electrical Apparatus.

MEANS FOR PREVENTING SPARKING WHEN MAKING AND BREAKING CIRCUITS. - Adolph
Müller, Hagen, Westphalia, Germany, A circuit in which an electromotive force is opposed to that of the current source can be broken without sparking by increasing the opposing electromotive force until it equals
that of the source of current before breaking the circuit. This is effected. according to the present invention, by introducing mto the circuit, before disconnection, a bat tery of elements which easily becomes polarized. Such
a battery is immediately polarized on entering the circuit to the tension of the current within the circuit; or it mmediately increases any opposing electromotive forc vi hich may be present in the circuit until that force is equal to that of the source of current.
incandescent lamp.- Andrew h. Miller, Central City, Colo. The filament of this incandescen lamp is in two sections and is associated with such con-
nections as permit it to be cut in and out of circuit in nections as permit it to be cut in and out of circuit in power of the lamp. By means of the invention three distinct adjustments and hence three distinct candlepecially desirable in hotels and hospitals where it is desired to vary the power of the lamp.

## Mechanical Devices.

Floor-surfacing machine. - Henry McLoughlin, Leavenworth, Kans. In the wheel sup-
ported frame of the machine a primary-movement shaft is mounted, having a slidable worm meshing with a
worm-wheel. A clutch member fast to the shaft drives wor:n-wheel. A clutch member fast to the shaft drives
the worm. Gearing connects the worm-wheel with the wheels of the frame. In a swinging frame on the main frame cutting apparatus is mounted, driven by gearing
from the primary-movement shaft. By means of this machine large areas of tlooring can be quickly planed or true-surfaced without excessive labor.

## Railway-Appliances

CatTle-guard.-Joseph W. Ross, South Carcollton, Ky . The cattle-guard is of that form in which a railroad crosses a fence-line and is provided for some
distance along its track with an impassable road-bed armed with spikes to prevent cattle from passing. The uy spiked zlyzag plates having a bearmg on the tles mid way between their upper and lower angles. It in driving the spikes. and that the ties afford a stiff backing for the plates at a point where they are especialls weak and liable to be indented by the hoofs of anımals. LOCKING DEVICE FOR CAR COUPLINGS.George P. Stewart, Palestine. Tex. Janney carcouplers are subject to accidental release of the knuckle from engagement with the opposite coupling. To prevent this, the inventor employs a transverse rockable lever upward movement. A pendent weighty dog on the
draw-head is hung above the free end of the lever. The
upward movement of the key is prevented until lever and dog have been simultaneously lifted.
SIGNAL-LAMP-RAISING DEVICE.-Thomas J Walsh, Walton, Ky. The object of the invention i lamps at railway-stations, thus obviating the danger incurred in using the customary portable ladders. At the upper end of the signal-lamp mast a lever is pivoted from nd by of which a pulling device extends downwardly, rope is passed around the pulley and connected with the lamp. By this arra
the station or office.

## Miscellaneous Inventions.

CISTERN.-William J. Slack, La Grange, Ind achment for removing foul water and sediment from cisterns. The attachment is a castung formed with cir
cumferential flanges to adapt it for forming a wate tighferential foint with the wall of the cistern anding a water tral depression or cavity which is of conical form to dapt it to collect the sediment a discharge form provided which communicates with the cavity, and which re
action.
SWINGING-DOOR ATTACHMENT. -- Join H. Whitaker, Davenport, Iowa. Waiters in restaurant nd hotels have a habit of kicking open swinging doors,
thereby often upsetting their trays and dishes. The present invention provides an attachment consisting of a racket secured to and extending outwaraly from the vanged for on the outer end of the bracket, and is ar open the door. Owing to the peculiar arrangement of the wheel, there is no danger of the door's swinging bac gainst the waiter before he has passed through.
I.VVALID-bEDSTE \&D.-ELmer C. Scribner, Neversink, N. Y. The invention comprehends a novel construction of sectional bottom members having the foot portion formed of two longitudinal frames capable of
being raised in unison or independently, and a single crank-operated mechanism, indluding shifting clutches to nove into or out of operative position, whereby either
one or both of the foot-frames can be elevated. The ongitudinally-tiltable foot-frames are each made of two hinged sections, so that when elevated they may assume valid's knee.
ChURN-Henry G. Schatz, Commerce, Mo. The hurn is provided with a vibrating dasher capable of being regulated to suit different churn-bodies. The shaft operated by a handle. An end of the handle is on the lever to shorten or lengthen the stroke of the

PROCESS OF MAKING DRY PIGMENTS process of producing dry pigment consists in saturatmg
sawdust with an iron salt, and then drying or burning it.
Sawdust being a waste material, it follows that the pigment can be very cheaply made.
FOLDING BED FOR VEHICLES.-Thomas Loth erington, Dallas, Tex. The folding bed is provided with bottom, and transverse supports for the sides havin vertical locking members at their outer ends. Box sides are adapted to rest on the supports and engage the side
edges of the bottom and the vertical locking members. Lock bars are removably secured to the sides and adapted side of the bottom. The vertical locking members and lock-bars have engaging shoulders and lugs. The bed can be quickly and conveniently removed from the run-ning-gear, to permit the bed's being changed from
wagon-box to a dray, or from a coal-car to a flat-car. acetylene-gas lamp.-George w. Bayley Brooklyn, New York city. The lamp comprises an in
her and outer casing. The inner casing contains carbi nd has a pressure-controlled valve in its bottom for the admission of water. An annular, closed wate--reservoi within the outer case is located above the carbid in the holder. A valve in the bottom of the reservoir provide means for allowing the water to flow into the oute asing before being admitted to the carbid. A vent con nectstue upper pa
space of the lamp.
SPOUT-GATE AND MECHANISM FOR OPERAT NG the same.-Henry F. Kubs, Escanaba, Mich The invention is more particularly designed for use in rom a dock into a vessel or from a platform into a car The gate is mounted to swing vertically between sup ports at the discharge end of the spout. A locking-frame is mounted to slide in guides on the supports and is con-
nected with the gate, so that when it is raised the gate will be opened.
Waste-pipe PlUg.-Joseph H. Little, Manhat arl, New York city. The present invention provides n a portion of its length and then diverging and havin inwardly-turned hooks. In applying the plug, the link will be forced down wardly over amemberof the strainer The hooks will be spread apart so as readily to pass the member of the strainer. When water is to be retained the plug is inserted. When it is desired to draw the
water the plug is pulled up until the contracted portion water the plug is pullea up until the contracted portion
of the link comes above the strainer, the hooks prevent ing the total detachment of the plug.
Fire-escape.-Cbristopeer Peel, Manhattan, New York city. An upright ladder on the building is connected with foldable guard-walls above the ladder
and adjacent to the windows of the building. The walls each have a foot-board foldable over an aperture thereof and adapted for projection beneath a window when the wall.
boiler-attachment.-Cearles W. Sommer, or the collection and removal of sediment. The attach ment comprises a pipe-line beneath the boiler, communicating at one end with the steam-space and having a
pipe-line and establish communication between the
lower portion of boiler and pipe-line lower portion of boiler and pipe-line. A branch comsunicates with the pipe-line and extends upwardly into the boiler and has openings adjacent to the crown sheets. When sediment is forced through the pipe-line, a suction ing in the bottom of the boiler is drawn through into the pipe-line and forced out by the steam.
Game.- William a. Wissemann, Manhattan, New York city. The game simulates the battle of San Juan Hill and involves a fort or block-house over which a manipulating a number of balls so that thes will ente the block-house, the supposed hostile flag will be autoratically caused to disappear and an American fla rised.
ROTARY BRUSH.-PeterK. Westergard, Orangeburg, N. Y. The brush is designed for the use of
barbers and stablemen to remove impurities from the hair or scalp. The rotary brush is mounted in a frame and is secured to a vertical standard. On the standard hand-wheel is journaled by which the brush is turned through the medium of bevel-gears. Beneath the brush receiver is mountea which collects the impurities moved from the hair or ski
HUB FOR VEHICLE-WHEELS.-CASImIR C. BALLin, Rue de Chateaudun 5, Paris, France. The invention wheel-nave proper, which carries the spokes of the wheel, and the revolving socket supported on the axle of an elastic non metallic pad or cushion, the soft body of which diminishes the force of the jolts. This pad is formed of two series of caoutchouc balls arranged concentrically around the central socket and in the first place tightly packed in a chamber or race. The pad is pression at the moment of the shock to be effected by simple displacement of the elastic material itself and not by rubbing on the walls which inclose it, as is the case with a continuous ring.
FIRE-ESCAPE.-José Delgado y Agullar, Brooklyn, New York city. A strong yet simple device has been provided by this inventor for permanent attach-
ment to the outside or inside of a building, which attachment to the outside or inside of a building, which attach-
ment affords a rapid means of escape from burning ment affords a rapid means of escape from burnhg
buildings irrespective of the number of floors. The invention consists of a simple arrangement of a bracket carrying a pulley around which an endless rope runs. At he lower end of the device a controller is provided which regulates the speed of the descent.
LIGHTING ATTACHMENT FOR VAPOR-LAMPS, James A. Yarton, Omalia, Neb. The invention re-
ates to improvements burners of that kind in which a generator is heated by the flame of the burner; and it comprises essentially a carbureter of special construction which is designed to furnish a limited quantity of gas applied to heat the
generator to working condition before the ordinary or service generator is brought into use.
horseshoe. - William Cabill, San Francisco, Cal. The horseshoe is especially designed for use on
racing-horses. A light-metal plate is adapted to be at-racing-horses. A light-metal plate is adapted to be at-
tached to the horse's hoof to hold in place an elastic pad,
which bears against the frog of the hoof．At its lower
face the plate has a bar or shoe constructed and ar－ frace the plate has a bur or seo constructed and ar
ranged with relation to the plate in such a manner as to protect the hoof more effectively than the devices here tof ore provided．
screen for stamp－mills．－－Martin R．Dris－ coll，Frifco，Utah．The mill has an apertured frame
above which a roll of screen material is mounted，having a portion extending over the aperture．A clamping－frame estends about the lower and side edges of the aperture auu covers the edge of the screen material．The
frame has verticall $f$－extending boltreceesees in its side－ frame has verticaly－extenange boit－receses in ins inde．
bars，clamping－bolts within the recesses and an auxiliary clamping－bar engaging the outer face of the lower sid of the clamping．frame．By loosening the clamping frames and bars the screen－cloth can be pulled down to bring an unused portion into use without stopping the SEWING－machine Shuttle．－Percy h Hewitt．Edwina．Cockle，and Cables Matthews， London，England．An improved construction of shuttle tages incidental to the use of a special spool of small capacity are avoided．The shuttle has its case divided longitudinally into two parts，which parts are provided at their heels with interlocking projections and recesse
engageable by a relative longitudinal movement of the partsand permitting a slight hinging action．One par has a transverse pin at its point and the other a longi－ tudinal slot receiving the pin．On the point end of one
part is a spring，engaging a catch on the other and part is a spring，engaging a catch on the other and
straining the parts longitudunally to hold the interlock ing parts in engagement．
Water－Wheel．－Patrick Henretty，Belgrade intervals with peripheral sockets．The bucket－chai used consists of a series of buckets equally flared on ture with eyes．Through the overlapping eyes of ad－ joining buckets a shaft is passed，provided alongside of
the buckets with rollers operating in the sockets of the pulleys．Links connect adjacent shafts outside the

Shank for cornets．－William h．Horn，San Francisco，Cal．，and Cuarles L．Wain，Kamloops， Canada．The shank is arranged to permit the performer
to set his cornet to different keys without requiring sepa－ rate shanks．The shank is made in two sections sliding one within the other，the outer section having a head with internal threads and theinnersection havingtwoex ternal threads capable each of engaging with the threads
of the head to hold the inner section in either one of two positions．
CHIMNEY TOP OR VENTILATOR．－Josepi A ventionare found in the effective method of securing the base－plate to the chimney by means of anchor－bars，
in supporting the top carrying the cowl by means of strong slender standards so that no obstruction is offere to the free outlet of smoke from the flue pipe，in secur guard－plate is held thereto by means of arms，and in the
novel method of counterhalancing the guard－plate an
vane．The merits of the invention lie in the uninter rupted passage provided for the smoke，in the preven tion of downdraft，and in the counterbalancing of th

## Designs．

hammer－head．－Daniel S．Williams，Salid and Frederick R．Waters，Ouray，Col．The leading feature of the design is the form of the flared groov
socket in the side of the polygonal hammer－head．
ORNAMENOD STONE FOR JBWELYY
L．Herzoa，Manhattan，New York city，The desi L．Herzog，Manhattan，New York city．The design
consists of an elk＇s head produced upon a background of stone．
Shoe－Lace fastener－George h．Richards， Memphis．Tenn．To prevent the tearing of the shoe－ lace and yet to hold the lace securely in place，the in－
ventor forms the head of the fastener on its under side with a spherical surface．
Cream－separator．－Cbarles S．Hanna，West Hebron，N．Y．The design consists of a cylindrical body having a base anll an inverted cone－shaped bottom
terminating at its apex in a gage with a faucet． terminating at its apex in a gage with a faucet．
Note．－Copies of any of these patents will be furn－
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The Manufac＇rure of Sadsages．B $\begin{array}{lll}\text { James C．} & \text { Duff，S．S．} & \text { New York：} \\ \text { National } & \text { Provisioner } & \text { Publishing }\end{array}$ Company．1899．Pp．131．16wo Price $\$ 2$.
This is the first and only book on sausage making printed in English and there has been a considerable de－
inand for a good book on this subject．The book will pay its cost many times over to even the smallest retai butcher．while to the sausage maker it will prove invalu－ able．Not only is information regarding meats．spices， casings，stuffings，etc．．given in great detail but there
are almost endless receipts for all kinds of standard and fancy sausages，some of the names of which recall far away Strasburg and Nuremberg．It is an admirable book and the iterature relating to provision
that we welcome every addition made to it．
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line of Presses，Dies，and other Sheet Metal Machiners． Inventions developed and perfected．Designing and
machine work．Garvin Machine Co．， 141 Varick St．．N． Y The celeorated＂Hornsby－Akroyd＂Patent Safety O nine Company．Foct of East listh Street，New York． The best book for electricians and beginners in elec By mail，\＄4．Munn \＆Co．．．publisbers， 361 Broadway，N．Y． The Milling CutterDepartment of The L．S．Starrett Co in be continued under the frm name of Gay \＆Wara，
Anss．Owing to the increased business of th tool department．Mr．Starrett has withdrawn his inter
est in the milling cutter department，in order to devote his attention exclusively to the manufacture of fine
tools．Messrs．Gay \＆Wara still continue to manufac ture milling cutters under the immediate supervision on
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surpassed line of cutters．
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toferred to promptly supplied on receipt price．
Minerals sent for exannination should be distinctly
marked or labelea．
（7703）W．G．B．says：Have you pub－ lished a formula for making an ink that would do to
write on photographic negatives（for numbering them， etc．）with an ordinary pen？If so，kindly advise me th number of the copy in which the above formula can be
found．A．To print the name on the photograph，severa found．A．To print the name on the photograph，several
methods may be adopted．The simplest is to write the title of the subject on a slip of paper with aniline copy ing ink，or with ordinary copping ink mized with gamboge or vermilion．Then slightly dampen the sur－ face of the negative near the bottom right or left hand
corner in as unobtrusive and unimportant a portion o corner in as unobtrusive and unimportant a portion of
the picture as possible．Press down the paper with the writing upon it．Leave for a few minutes and then re ove the paper，when the writing will be found to hav print out white．Another way is to write backward on the negative，while another and better plan is to write the name in Indian ink on the surface of the paper be
fore it is printed on．The ink will wash off in the afte perations and leave the nume in white where the sur face of the paper has been protected by the ink．
（7704）J．W．M．writes：There has been quite a discussion here caused by jour article on the 16 nch gun．The question is，＂What is the fall of the curve of the water when looking one mile out to sea？＂Or
rather the ratio．For instance，the first mile view will have a fall of 8 inches．What will the second mile the earth＇s curvature when looking out to sea；


INDEX OF INVENTIONS
For which Letters Patent of the United States were Issued for the Week Ending JULY 25，1899，
AND EACH BEARINGTHAT DATE．







ouping，P．C．Ewart：
coupling．L．McKee
ouplin．L．





loset．See water cioset．．．．．．．．．．．．．．．．．．．．．．．．
loset ventilating and flushing apparatus，w．
Brickell







Culingry vessel，self draining．H．J．Carden．．．．．
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anism for，R R Romain．






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