## RECENTLY PATENTED INVENTIONS.

## Electrical Device

ELECTRIC RAIL.-L. Steinberger, Ne York, N. Y. Among the several improvement for heating the Sternberger provides a system of snow and ice; renders the heating mechan ism readily accessible without incurring dan-
ger on the part of operators; provides thorger on the part of operators; provides thor-
ough insulation between the rail and its support ; renders different parts of support detach able, so that the same may be taken asunde without much interruption in traffic; concen trates the heat as nearly as possible to con
tact-surface of the rail; confines and retains heat near contact-surface and prevents its ab sorption by the body portion of the rail-sup in the rail, to prevent radiation of heat except in the rail, to prevent radiation of heat
toward the contact-surface of the rail.
insulator-pin.-L. Steinberger, New York, N. Y. The more particular objects of
this inventor are to so improve the insulation as to lessen the tendency under wet-weathe conditions of a high-voltage current to arc over the surface of an insulator or its support or
partly ovèr the surface of an insulator and partly through the air from the conductor to the ground or to the support for the insulator if this support be grounded. He also seeks to preserve the insulating device and its accomand to enable it to be used for supporting in ILLUMIN fupporting a conductor directy. New York, N. Y. The invention has reference
to an illuminating device intended especially to an illuminating device intended especially lights, but useful with other lights, if desired It resides in certain novel features of con-
struction and arrangement of parts, involving a struction and arrangement of parts, involving rotating light by means of which

## of Interest to Farmers.

HORSE-HOE.-E. A. Harver, Hillsboro Bridge, N. H. In this patent the purpose of
the invention is the provision of a construction of horse-hoe whereby the wings can be opened and closed more expeditiously and conjustment of the wings can be readily mad while the hoe is in operation
hay-Press.-C. Cotham, Monticello, Ark The invention relates to presses of the toggle provide a press of this character having new and improved means whereby the plunger may be operated, but also to simplify and improve
the press-box, feed-door construction, and frame.
Cultivator.-E. b. Winters, Coffeyville, Kan. The purpose of the invention is to provide a simple implement having disk cutor pulling and to provide such means for ad justment of the cutters that the implement may be quickly and conventently adapted for the cultivation of plants on a reach of level
ground or in a hollow and whereby further adjustment may be made to adapt it to wide or narrow rows. It relates to hand or garden
cultivators.
PORTABLE FENCE-POSTC.-W. R. Harris, Pelican, La- Mr. Harris has produced a port-
able fence-post and base therefor possessing advantageous features of construction and or
ganization, and the entire structure is readily portable besides being strong, durable, and capable of withstanding strains. Members of the post can be separated from each other fo any purpose, and the materfals employed in
constructing either post or base may be such constructing either post or base may be such
as may be found to be best suited therefor in different localities.

## Of General Interest. Mr. Howland's invention relates to oiling ap paratus, and more particularly to cans pro vided with a force-feed. The arrangement of the valve for ready cleaning, the means used cessible places, the retention of oil within the the piston raises the valve and forces out the oil, and the effective venting of the can, ar among the advantages of this efficient device. COKE-PULLER.-H. F. Pearson, Redstone Col. This apparatus is especially adapted for use in pulling coke from the ovens and loaduse in pulling coke from the ovens and load- ing it upon wharves or cars. The objects of the invention are to improve the construction of the device, to render it universally adjust able, so that the material may be reached a all points and from all directions, to make it easily operable by a single attendant, and to make it efficient and certain in operation. <br> METHOD OF REVIVIFYING SPENT Clays.-A. B. Latting, Memphis, Tenn. In this patent the improvement has reference to a method for revivifying spent clays-such, for instance, as fuller's earth and other mineral substances used for purposes of absorbing grease, cleansing garments, and the like. By the means employed by this inventor cess is rendered virtually continuous. <br> BLANKET-PROTECTING DEVICE.-T. T N. Y. The invention has reference to improvemeiting and tearing his blanket or clothing while

$\left|\begin{array}{l}\text { in a stall and also serves as a means for pre- } \\ \text { venting a vicious horse from turning his head }\end{array}\right|$ laterally to injure with his teeth a person who ay be leading him.
HARNESS-SADDLE.-G. MCMULLin, Elk apids, Mich. The invention is an improve the construction and attachment of a check line fastening or loop. Another, the construc tion and attachment of leather terrets. Th addle is particularly adapted for use as coach-pad or gig-saddle. This saddle can be ade for track-harness, light driving-harness, ade for double harness, dispensing with th sliding bearing-strap.
SAND-DRIER.-W. KING, Cedar Rapids, Towa. The principal objects of the invention
are to provide means for the effective separa tion of sand from coarser materials mingled therewith, for drying both the fine and coarse aterials, and for separating the former from the latter. Further objects are to provide
means for permitting steam or any volatile matters to escape from the material operate pon, for slowly feedio the matin he apparatus and applying heat in an economcal and efficient manner.
BOILER-TUBE FASTENER.-A. J. ERvin and J. R. Walker, South Cumberland, Md. any change in the tube-sheets as ordinaril rranged, and the same tubes may also be used, only, furnish the separate nipple. Flues are nds cold, is eliminated. Each tube acts as a tay, drawing the opposite sheets toward one nother and preventing loosening of tubes When these tubes are used as flues, means provide for avoiding undue expansion and con traction. Either end of the flue may be re
noved separately without interfering with th moved separa
other parts.
FOLDING BOX.-C. B. Rutledge, Tulla-
oma, Tenn. This invention relates to folding homa, Tenn. This invention relates to folding
boxes, popularly called "knocked-down" bexes. oxes, popularly called "knocked-down" boxes
it is intended to be especially useful as a re eptacle for articles of any kind and is capable being folded up into a can be quickly opened out into the form of a
box. The box should be especially useful for
grocers. grocers, drug
ous purposes
OIL-CAN.-T. B. Wilkinson, Rivera, Cal. novel construction whereby the fluid con ents of the can may be forcibly ejected through the spout by a pumping action. To
discharge oil the operator grasps the handle of discharge oil the operator grasps the hande of
the can and the pull-bar will press the latter up against the handle, and will eject the oil by od and spout.
SELF-MEASURING CORK.-E. S. Ray avention relates to measuring stoppers or corks for bottles or like vessels, and the object had in view is a device of that character af-
fording in itself the ready measuring of medifording in itself the ready measuring of medi
cine in tea, dessert, or table spoonful. It is particularly useful to persons traveling o ars, as the jolting or vibrations thereof re measure medicine with a spoon.
HAND-OPERATED PUMP.-W. H. JORDAN Hars, Kan. The object of this invention is to and-operated pump which adapt it for very convenient and effective service as an instru ment for the abstraction of pus or extrava-
sated blood from a wound, boil or ulcer on the sated blood from a wound, boill or ulcer on the LAUNDRY DAMPENING APPARATUS.is. M. Forbes, Portage, Wis. This apparatu intended for use in applying steam or vapo
to starched goods along the lines of fold in order that they may be folded without difficulty or any danger of breaking or unduly strain
ing the fabric or fibers thereof. The inven tion is more particularly an improvement up
on the portable hand-tool for which Letter on the portable hand-tool for which Letter Patent of the United
granted to Mr. Forbes.
FURNACE-FRONT.-J. BISHop, Bartow Fla. The invention relates to furnace-fronts of this part, to increase durability, and rende the fire-bed more accessible. A further object is to improve the construction of water-jack eted doors used in furnace construction Among the many advantages, the horizontal arch construction facilitates the care of the
fire; and a certain fire-door is water-jacketed fire; and a certain fire-door is water-jacketed,
preventing the door from becoming highly preventing the door from be
heated and warping out of shape.
MAIL-BOX. - is inted and rural delivery of mail-matter. The inve tion provides a novel construction of box made of metal and suitably constructed of the different plates secured together. A plate may be
provided in front to receive name and number The drop-lid can be thrown open and will $r$ main so while letters are being placed in the box. If desired it may be cast in aluminium
for attachment to office-doors, club-rooms, rooming-houses, et

SQUARE.-D. B. Lynch, Reno, Nev. The inprovement pertains to squares, and has for by the aid of which a number of operations
the handle and blade may be provided with
the usual scales upon both sides, and in the the usual scales upon both sides, and in the
handle is an opening for hanging the tool. Near the center of the handle an opening is formed to receive the level.

Machines and Mechanical Devices.
AUTOMATIC DAMPER AND VALVE REGULATOR.-C. E. Sanford, Oswego, N. This device admits of general use, but is
peculiar value in cases where the mechanism is desired to be simple and reliable, and more particularly where the apparatus is provided with electric circuits in which it is desirable to prevent the circuits from being closed by any means so as to remain closed, battery en
ergy being thus conserved.
TREADLE-HAMMER.-C
Blaagaardsstræde, Roskilde, Denmark. In this improvement the rear end of the hammer-arm
is secured to a plate spring, the lower end of is secured to a plate spring, the lower end of
which is connected through the medium of rods, and a system of similar springs pivotally mounted in the underframing to another spring is in turn coupled by a strap fitted with an adjusting-screw to a further spring movably connected at both ends to the underframing, so that the last-named springs can be brought nearer to or farther away from each other
by means of the adjusting-screw, whereby the by means of the adjusting-screw, whereby the
hammer can be raised to greater or less extent according to the blow to be delivered, by deessing the treadle.
ORE-CONCENTRATOR.-M. R. Lyle, Oak cially with the construction of a concenf espe or dry washer. The object of the inventor is to produce a device which is simple in construction and which subjects the ore-bearing gravel or earth to a succession of separation by gravitation. Means are provided for agi-
tating the device during the concentration pro-
REGISTERING DEVICE FOR PRINTING Machines.-W. H. Waldron, New Brun wick, N. J. The invention relates more par in which the paper is run two or more times hrough the machine for successive impressions The object is to provide a registering device permit a quick, convenient, and easy adjust ent of the printing-rolls relative to the im ering of the printing-rolls with a previous voting machind
eka peka, Kan. Among the several objects of the
inventor are, first, to prevent fraudulent vot ing by providing certain safeguards of a mechanical nature; second, to protect the voter from espionage while giving him unrestricted choice as to candidates and parties; third, to provide certain improvements in construction
and operation whereby the general purposes of
voting-machine are carried out more efficient voting-machine are carried out more efficient
y. The mechanisms provided are automatic. wheelbarrow-bearing. - J. Stanley is to provide . Y. The object of the invention rucks, and other wheeled vehicles, apply, and arranged to produce an equal distribution of the load on both ends of the axle to reinforce the forward ends of the frame beams, to insure an easy running of the wheel,
and to prevent the latter from falling out or and to prevent the latter f
being forced out of position.
Derrick.-E. A. Sohn, Bedford, Ind. The which the source of motive power, the drums, and all of the gearing are connected with the producing thereby a self-contained derrick and avoiding the usual practice of leading the boom and fall ines from the derrick to a power-house lo-
cated at some more or less distant point from the derrick.
BRAIDING-MACHINE CARRIER.-R. HAN USCH, New York, N. Y. The object of th adjustable racer-base to allow of readily and accurately fitting the base on a race-plate of wear and to permit of conveniently and cheaply renewing the base in case the same is comconvenient removal of the yarn-guide for $r$ pairs or other purposes.

Prime Movers and Their Accessories.
ROTARY ENGINE.-H. M. Lofton lanta, Ga. This invention relates to a type f rotary engine in which the rotary piston has radially sliding blades adapted to be pro-
jected beyond the periphery of the piston durjected beyond the periphery of the piston dur-
ing a portion of the revolution. A piston of his character is employed in connection with entor provides an interior surface of in casing on certain curves of his own devising which he finds to give improved results in securing smooth and easy operation of the engine free from pounding. The engine also has various other improvements including nce the pressure of the portion of their travel.

Rallways and Their Accessories.
SWITCH.-J. C. Scargle, Philadelphia, Fa
he design in this case is to automatically op
erate the switch by a passing car or train. means for efficiently operating the switch in a simple manner without greatly increasing the cost of the equipment, and also to improve cost of the equipmiteh, itself. It is applicable
the form of the swith
to steam, electric, and in fact, all other forms to steam, elect
of railways.
CAR-JOURNAL 1:0x-A. V. I'xillamb, San Luis Potosi, Mexico. The object of this in-
vention is to provide simple novel details of vention is to provide simple novel details of
construction for a car journal-box which will permit the use therein of the standard brass and facilitate the free removal of a worn-out or split brass without excessive loss of time merely raising the box sufficiently to re move the bearing-weight from the brass that
is to be displaced, and thus enable the insertion of a new one.
Raillroal-tie.-J. L. Catlett, Vincennes, Ind. Mr. Catlett's invention is an improvement in steel cross-ties. In his construction
the ties are laid along the road-bed, the rails the ties are laid along the road-bed, the rails
laid thereon and secured in place. No gaging laid thereon and secured in place. No gaging
is required, since the ties themselves gage the s required, since the ties themselves gage the
rails, and as the ties are of uniform size no blocking is required. When properly ballasted, the ties are immovable and traffic tends to fix them more securely. The track is more easily kept in shape and the rail will
from depressions due to imperfect ties. APPARATUS FOR LAYING AND TAKING UP RAILWAYS.-G. I. Ritchie, Crossett, Ark. Mr. Ritchie's invention relates to an apparatus or laying down and taking up railways which is adapted particularly for use in connection with temporary roads, such as those which are dustry rail or tramways are frequently laid through forests, and when the supply of timber along the road is exhausted the road is taken up and relaid, these operations frequently recurring and involving considerable expense. The object is to provide a practical means for doing this work quicker and at less expendireat facility arrangement he is enabled with great facility either to take up or lay down
railway, dispensing with all hand-labor excepting in bolting up or unbelting fish-plates to connect or disconnect track-sections.
Rail.-H. Herden, Wellsboro, S. E. Fitch, patent the invention relates to certain improvements in rails, especially those for use upon
railway-tracks, and includes a method of constructing a railway-track with such rails. The vide for more rets of the invention are to proails and for more position upon the track and to each other.
RAILWAY-RAIL JOINT.-J. T. Evans, New reference to improvements in joints for railway-rails-the inventor's object being to provide a joint of novel construction that may be readily placed in position and secured without the em-
ployment of bolts as ordinarily used with fishployment of
plate joints.

## Pertaining to Recreation

Game apparatus.-W. J. Hamilton, Franklin, Pa. The purpose here is to provide and one that will tax the patience of the player, in the playing of which it is required player, in the playing of which it is required
to transfer marbles or other rolling objects from a tunnel or subway to a plane surface above it, which surface is provided with openings communicating with the tunnel, the trans-
fer to be made by shaking the device until fer to be made by shaking the device until
all have passed through one at a time, it being all have passed through one at a time, it being the plane until all objects have been landed.

## Pertaining to Vehicles.

COMBINATION BED AND CARRIAGE FOR CHILDREN.-S. D. Carmichaec, Tama,
Iowa. This contrivance may be readily taken apart and folded together, either for storage or transportation of the structure, and again
assembled in position for use. It affords the maximum of comfort to the occupant and may be converted into either a cariole or a bassinet when desired, and possesses all of the advantages of the indoor uses for which the latter
are usually employed. It is comparatively are usually employed
breeching.-C. A. Ackenhausen, Leavenworth, Kan. The object here is to provide a
leather breeching for harness which will more effectively resist the destructive strains to effectively resist the destructive strains to
which the breeching is necessarily subjected and which will also enable the breeching to be constructed more easily and cheaply than herebody. The end is attained by forming the section of leather, the breeching of an integral hip straps are attached by rings or buckles. VEHICLE-WHEEL.-G. L. Glaser, New York, N. Y., and J. Olsen, Jersey City, N. J. wheel which contains in its inner circumference, not in contact with the roadway, an
elastic or pneumatic cushion which takes up and diminishes any shock or jar upon the axle as the result of the wheel rolling over uneven roadway and which contains a mechanical contrivance constructed so that the driving-hub
may be instantly displaced from its center when at rest and will as quickly recover its normal center, or, in other words, the hub may assume eccentric centers to which it may be pressed
by shock or jar and will instantly and automatically resume normal center.

Designs.
Design For a chair.-W. F. Wittich, Cody, Wyo. In this instance the designer has produced a new, original, and ornamental argraceful manner. The whole frame is made up of antlers. The seat and back upholstered, and the latter shaped like an inverted shield,
in the upper part of which a circular clock in the upper part of which a circular clock
is inserted. design for a rosary.-h. f. Nehr, New York, N. Y. The ends of the main length
of this beautiful article, are brought together of this beautiful article, are brought together
and fastened in a heart, pendent from which and fastened in a heart, pendent from which
is a short continuation of the above mentioned length holding at its extreme lower end a neat length holding at its
and chaste crucifix.

Note.-Copies of any of these patents will be furnished by Munn \& Co. for ten cents each the invention, and date of this paper.

Business and Personal Cuants.



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 nquiries not answered in reasonabie time should bol
repeated; correspondents will bear in mind that
 $\underset{\substack{\text { lis } \\ \text { his } \\ \text { uyers } \\ \text { ti } \\ \hline}}{ }$
 adaresses pecial Written Information on matters of personal
rather than general ion terest cannot be expected
without remmer
 Books referred to promptly supplied on receipt of
price. Minerals sent for examination should be distinctly
marked or labeled.
(9849) W. C. N. asks: 1. What is quarry water (or sap)? What effect has it on
stone and how it it gotten rid of? A. We
would say that quarry water or sap is the

## 

water or moisture which is absorbed in stone ow the level of the ground water in the territory surrounding the quarry. Many kinds of
stone are sufficiently stone are sufficiently porous to absorb a con-
siderable quantity of water in this way. Quarry water may be got rid of by allowing the
stone to season or dry out by exposure to the
 Construction, "Needles, ised to support or jack up a wall temporarily,
when the underpinning is taken out. "Chases" are cavities or recesses left in walls to receive pipes or wires. The term "staggered" is used to describe methods of spacing different arti-
cles, such as the rivets in a riveted joint of a les, such as the rivets in a riveted joint of a
boiler. When each rivet in one row comes opposite. the space between the rivets in the ad joining row, the rivets are said to be "stag.
gered." Fig. 2 shows three rows of which are not staggered. Fitg. 1 shows three
rows of rivets which are staggered. (9850) L. L. says: Some years ago he Scientific american gave a very simple river without any other instrument than measuring tape. A. Select a tree or other con-
spicuous object on the farther bank of the

river, as $A$. Select another tree or stake on
the near bank of the river, as $B$. Measure off any convenient distance-say one or two hun
dred feet-from $B$ to the point $C$ which shall be in the line $A B$. Select a third tree or stake, as $D$, and complete on the ground the parallel-
ogram BCED. Then find the point $F$ on the ground which is in line with $E C$ and also in line with $D A$, and measure the distance from
$E$ to $F$. Then $A B$ will equal $B D$ multiplied by $E$ to $F$. Then $A B$
$B C$ divided by $E F$.
(9851) D. L. asks: 1. Kindly explain through your magazine how, by experimenting
with a pendulum, it has been calculated that Whe gravity force of the earth is 289 times as
the
great as the centrifugal force at the equator g. The force of gravity at any place is deter-
A mined from the time required by a pendulum of known length at that place to make one oscillation. The centrifugal force of the earth at the
equator is determined from the length of the day, or the velocity of rotation of the earth at the equator. This gives the value of centri-
fugal force as 0.1112 of the mass of a body at fuga force as o.1112 of the mass of a body at
the equator, which makes the body lighter by this amount. The force of gravity at the equa-
tor is 32.0902 . Hence if there were no centrifugal force, the weight of a body would be the sum of these two, or 32.2014, which is the real mass of the matter of the body. Hence centri-
fugal force lighens a body which equals $1 / 289$ very nearly. You can find all these matters demonstrated in the library
of the university of your city. The librarians of the university of your city. The librarians
will assist you to find what you need, or the professor of mecchanics or astronomy will advise
you. Watson's "Theoretical cou. Watson's "Theorretical Astronomy" will
contain it. 2. From an infinite or very great
distance, in an astron
will attract a body with an ultimate velocity
of 7 miles a second at the moment it would of 7 miles a second at the moment it would
strike the earth. How can I find the corres-
ponding velocity with reference to the sun and ponding velocity with reference to the sun and
the moon? problem of fall from infinity in Watson as
above, or in Young's "General Astronomy," Section 429. We can send you the book for $\$ 3.25$.
tin Youn's ""eneral Astony . If we imagine a tunnel through the earth and through its center (or 8,000 miles long),
then letting a body fall into it, what would be then letting a body fall into it, what would be
the maximum velocity, and at what point in the tunnel would that velocity be attained A. A body falling through the earth as you cescrse of he have its highest velocity at the
center of the earth. The finding of the velocity is a problem of analytical mechanics, to which we refer you. 4. If a bullet sent out from a
rifle and in a perpendicular direction wlll reach rifle and in a perpendicular direction wlll reach
a height of one mile, how far would it go at a height of one mile, how far would it go at
an angle of 30 degrees with the horizontal plane? A. If a bullet will rise a mile in a vertical direction, it will rise to the same distance when rising at an angle of 30 degrees t.
the borizon. 5 . What would be the weight cubic foot of water at a depth of 8 miles? The compressibility of sea water is 44 millionth
per atmosphere at 12 deg. C.; that of pure
water at the same temperature is 47 millionths,
while at the freezing point it is 50.3 millionths The temperature would vary considerably as
we descend in water. Upon this datum you as we descend in water. Upon this datum you can
calculate the density at a depth of 8 miles. We must say that your questions remind us of an examination paper in college, and we never
iked to take examinations.
(9852) F. L. J. asks: 1. In your is(9852) F. L. J. asks: 1. In your is-
sue of August 5, 1905, Query 9722, there is sue of August 5, 1905, Query 9722 , there is
described an experiment with a cent and a spool. I have tried this carefully several times,
but without suceess Kindly give me more comblet without success Kindly give me more com-
plete directions. A. Your failure with the spool and cent experiment is perhaps due to your having the cent too far from the end of the spool when you begin to blow. The pins should be driven into the spool so that the cent is less than a sixteenth of an inch from the spool. When you blow, the cent will then se pushed up against the spool and held there
till you stop blowing, the spool being held vertically down. A disk cut from a calling card and as large as the end of the spool or larger will be drawn up from a greater distance below the spool. 2. How can I make a small trans-
former for former for transforming 110-volt alternating current to direct current of about the same voltage? A. A transformer of the ordinary sort will not change an alternating to a direct purpose, if you wish to obtain any considerable current. For small currents you may use an electrolytic rectifier. 3. Why are permanent magnets made of steel, while the cores of elec-tro-magnets are made of soft ir magnetized in
electro-magnet is always to be mage the same way, and it is not necessary to demagnetize it suddenly, the core is not made of iron the field the field cores of steel. When an electro-mag-
net is to be demagnetized suddenly, as when the armature is to vibrate like that of a telethe armature is to vibrate like that of a tele-
graph sounder, the core should be of soft iron in order to demagnetize it suddenly, and make the click quick and sharp. 4. Why are elec
tro-magnets always wound with a great deal of fine wire? A. Electro-magnets are not always wotnd with many turns. They are wound with the calculated number of turns to produce the
degree of saturation neeessary for their work. 5. Would they not give as good results if vound with a few turns of heavy wire, pro each case? A. Electro-magnets are not
wound with any coarser wire than can be
avoided, in order to keep the current as low avoided, in order to keep the current as low
as possible for the work to be done. The heating is in proportion to the square of the cur-
rent, hence with twice the current there will be four times the heating. For this reason a larger number of turns of finer wire are bette 6. Can the speed of an induction motro owered with a resistance in series with it? A The speed of an induction motor may be altered in a number of ways. One of these is by a
controller similar to that of a trolley car in controller similar to that of a trolley car in
the motor circuit. These methods of control the motor circuit. These methods of contro
are quite fully explained in Oudin's "Polyphase pparatus and Systems," which we can send
(9853) J. C. H. writes: I saw an ar-
icle No. 9806 , page 306 , dated 0 October 14 , ticle No. 9806, page 306, dated October 14,
1905 , in which R. L. I. asks a question about potential energy, and your editor says he did not know the definite answer. The following solution is the mest plausible when the coiled spring is placed in the tube and acid put on, a certain portion is dissolved, say the millionth part of a cubic centimeter. This sives a millionth part of a cubic centimeter which the remainder of the spring can uncoil and exert its energy. In this way the dissolved portion is always giving room for the heat in the coiled spring is greater than he heat in the coiled spring is greater tha
in an uncoiled one. This difference is small and would amount to such an infinitely swall amount, that it could be left out of question. A. If the explanation of the case bove satisfies our correspondents, we are quite satisfied that they should adopt it. It is a
case for quoting Mr. Lincoln's famous certif ase for quoting Mr. Lincoln's famous certif-
cate of recommendation of something which are recommendation of something which
was presented to him: "If this is the sort
of a thing a man would like, this is just the
thing he would like." We should not expect thing he would like." We should not expect
the spring to behave that way. We should expect it to grow weaker as it became thinner during its solution till at last it would have no elas ticity left with which to uncoil. Its reaction against the band which held it would diminish till nothing of the steel was left.
(9854) W. B. S. says: In the edition of your paper of July 15, 1905, question No.
9693, F. L. asks whether a bullet dropped $9693, \mathrm{~F}$. L. asks whether a bullet dropped
from the muzzle of a rifie would reach the ground quicker than one fired from the rifie fectly same elevation with the rine hela per thereto, but to my mind it does not explain all the factors entering into the problem. For in stance, the bullet fired from the rifie is acted
upon by two forces, i . e., the propelling force of the powder which forces the bullet in a direction diagonal to the pull of gravity, and
the pull of gravity; whereas the bullet dropped from the muzzle of the rifie is acted upon by the one force only, i. e., the pull of gravity It thus seems to me self-evident that when the bullet is fired from the rifie there is a force behind it which in a degree counteracts the pull of gravity, that is, this horizontal force
would tend to keep the bullet in the air longer would tend to keep the bullet in the air longer
than would be the case without this force. Moreover the bullet traveling in a horizontal direction would consume the extra time necesthe bullet dro horizontal distance, whereas have only the perpendicular direction to the earth. Why would it not then require less time for the bullet to travel the perpendicular
than the oblique distance? Would the speed than the oblique distance? Would the speed
of the bullet fired from the rifie or the resistance of the atmosphere enter into the problem as factors? A. The problem of the motion of a rifie ball shot horizontally and another drop-
ped vertically is a very old one, and there is no disagreement among scientific men regarding it. All the books say the same about it, that both balls keep in the same horizontal plane as they move. The force of the powder drives the bullet horizontally and has no infuence upon its downward motion. It falls by gravity alone, just as the one dropped vertically does.
As you say, there are two motions in the bullet As you say, there are two motions in the bullet
which is shot and one in the one which is dropped This statement makes the whole mat ter plain. The writer has performed the ex periment probably thousands of times, and never with any deviation in the result. Both balls strike the ground at the same time.
Neither the difference in the speed of the two Neither the difference in the speed of the two
bullets nor the resistance of the air is concerned in the motion of the bullets. Gravity draws each down the same distance in the same time.
(9855) O. F. N. writes: Question No. 9806 , asked by R. L. I., about the energy of a portance even if the spring is dissolved in some acid. That is my opinion. I have formed theories am inclined to beliese that you would not am inclined to believe that you would not
publish the same, as these theories seem to be against your own judgment that nobody knows the energy are not looking spring dissolved in acid, but for facts. Has anyone measured the recovery of the energy during solution, to tell
us what becomes of it? One speculation is no better than another if given by a person in has not experimenetal evidence to guestion of our own judgment, but one of experimental evidence. Anyone having experimental evidence on the matter can have a hearing.
(9856) G. B. asks: In projecting a lantern slide upon a screen with a single double convex lens the lines on the picture,
when viewed close to the screen, within a foot or two, give the colors of the rainbow. If, however, the observer goes back ten or twenty feet more from the screen all this color effect im-
mediately disappears. Will you please explain why this color effect is not equally visible at this distance. I understand, of course, if a
chromatic lens is used there will be no such chromatic lens is used there will be no such
color effect. What $I$ do not understand is why, rhen you see it so plainly at a foot away, you cannot see it equally plainly at 10 feet, equally visible at either distance. A. The lines of a picture are visible to the eye when a line subtends an angle at the eye of about a minute without This is the limiting angle of vision one foot from the screen on which is a picture with lines projected by an ordinary convex ens, the lines fill more than this angle. So
also do the interference fringes on the edges of the lines. At 20 feet distance from the screen a space twenty times as broad is re-
quired to fill the same angle as was filled by a line at one foot distance from the screen. All which is in the wider space is combined same size as was occupied by the line at 1 white light again, and only the black is in to If one uses an opera glass at 20 feet the as at the 20 feet divided by the magnifying power of the glass. If a glass magnified five seen at a distance of 4 feet. The restoration seen at a distance of 4 feet. The restoration
of the colors by the opera glass constitutes
rather a pretty optical experiment.

