san marino, the smallest independent REPUBLIC IN EUROPE.
Few visitors to Italy ever make the excursion from Rimini to San Marino, the smallest independent republic in Europe, although it is one of the most curious places in Italy, if not in Europe, for it has maintained itself as a republic ever since the earliest times of Christianity. San Marino, which has an area of 33 square miles, lies between the provinces of Forli and PesaroUrbino, and is thus entirely surrounded by Italian domains. It is situated on part of the eastern spurs of the Apennines. Monte Titano, the central and culminating summit, has three peaks, each surmounted by a castle, as shown in our engraving. The coat of arms of the republic is three feathers, which seem to have been suggested by these rocky summits with their fortresses. The city of San Marino has 1,600 inhabitants out of the 8,000 of the republic. It is one of the most picturesque places in the world, being perched on perpendicular cliffs; and when we look at them we can then understand that the extraordinary mountains and rocks introduced into the backgrounds of the paintings of Perugino, Raphael, and other Umbrian painters were not nightmares, but were really taken from nature. Borgo di San Marino, at the foot of the cliffs, is the conmercial center of the republic, and here we first find the money coined by it. A steep path leads up to the picturesque Citta, to which we have already referred. From the castle there is a magnificent view of the Adriatic, and even on a clear day the coast of Dalmatia may be seen. It is said that when the mail arrives at Borgo a bell is sounded, and those who live on the cliffs have to descend to get their mail, if they wish it ; for, owing to the primitive state of affairs, the postman never ascends the rock.
It may well be asked how it is that such an anomaly as the microscopic republic is allowed to exist in the heart of a monarchy. The history of San Marino is an interesting one. The first authentic document dates from 885 . The inhabitants purchased territory from neigh boring princes and the commonwealth assisted Pope Pius II. (Eneas Sylvius) against the Malatestas of Rimini, and as a reward received three little castles. On the annexation of Urbino to the States of the Church; in 1631, the independence of San Marino was acknowledged In 1797 Napoleon decided to preserve the small republic, and in 1854 Napoleon III. saved it from the designs of Pius IX. When Italy became unified, San Marino obtained excellent terms
It is governed by a great council of sixty members, twenty nobles, twenty burgesses, twenty rural landowners, named for life by the council itself. From this body is elected the Council of Twelve, which, with a legal adviser, decides all questions. Two captains-regent, elected every six months, represent the state, which

In order to avoid copyright difficulties, there is no printing press in San Marino. It is a curious fact that the commissary, or judge, and the physician must both be strangers, and they are paid out of the public purse. Such are a few of the curious facts connected with the smallest independent republic in Europe, or the world, for that matter.

## A NOVEL USE FOR DRAIN TILES

Florists and those who are interested in growing flowers can easily make a tiled bench which possesses


## DRAIN TILES FOR FLORISTS' BENCHES

remarkable advantages over the old soil benches, for if the first cost of the tiled bench is from 25 per cent to 30 per cent greater than the wooden bench. it is a great deal cheaper in the end, and the results are more satisfactory. While the drainage is perfect, still the soil will not dry so completely as with the bench with a wooden bottom. The benches rest on post placed four feet apart ; the cross pieces are two by four inches, and the stringers upon which the tiles rest are also two by four inches. The tiles used may be two or three inch, the two inch being slightly preferable but the three inch covers so much more space for the same amount of cost that they are much more econom ical. On these benches five inches of soil is placed, a the drainage is so rapid that this depth can be safely
used, and depth is considered desirable where the
to make a special flat, hollow tile for florists' use. If made with plenty of sand in the clay to make it porous, it would make a good bench for flowers and would perhaps be more convenient than drain tiles.

## Cost of Rare Metals.

The following shows the cost of rare metals per pound, avoirdupois, says The Mining and Scientitic Press:


Life is too short and full of care and sorrows for on to be the cause of adding one feather's weight of trou ble to another's load. Will Carleton, the poet, in the "First Settler's Story," we believe it was, makes the old man say, in speaking of his wife, that she used to stand around and boss the job, and by her kind word lifted whole tons. Kind words have the same effect the world over. They lift a fellow out of the slough


THE SMALLEST INDEPENDENT REPUBLIC IN EUROPE-THE THREE FORTRESSES ON THE THREE PEAKs.
has also its home secretary, its minister of foreign affairs, its chancellor of the exchequer, its army of 950 men, and a regular budget. By treaty with Italy, San Marino receives a certain proportion of the Italian customs revenue, but exacts no customs on her borders. She also agrees not to grow tobacco, but is allowed to import tobacco duty free.
drainage is such as to warrant it. The tiles are a trifle over a foot long, three lengths being used on a side bench, five lengths being used on a center bench. Occasionally a few of the tiles are broken in changing the soil, but this breakage is so unfrequent that the experse on this account is insignificant. The demand for tiles forthis purpose might induce manufacturers
of despond; they break the stiffened, set features of the worried into a pleasant, hopeful smile. And how much better it is to cultivate the habit of treating everyone as though a time would come when we should lay down the mortal form; and that to leave behind a character and reputation of fairness, truth, and honor is the most enduring of riches.

## Trade in Farming Implements.

At the close of the civil war a reaper, now selling fo $\$ 75$, cost $\$ 120$; a steel plow, now costing $\$ 12$, sold for $\$ 26$; a potato digger, now costing $\$ 7$, sold for $\$ 25$; grain scythes, now costing $\$ 9$ a dozen, cost $\$ 26$; shovels, now costing $\$ 9$ a dozen. cost $\$ 20$; binders, now costing $\$ 130$, cost $\$ 400$; and mowing machines, now costing $\$ 50$, cost $\$ 110$. As this process of reduction has been going on, the product of American factories in the line o agricultural implements has been generally extended and vastly improved, so that the United States are now not only at the head of all other countries, but so far at the head of other countries that there has prac tically ceased to be any serious competition, except in respect to the supplies sold by certain European coun tries to their colonies. Through the free markets of the world, without restrictions established by governments, the United States are the great source of supply.
The importance of the business carried on both at home and abroad by the United States manufacture of farıning implements is shown by the figures of the last Federal census of 1890 . There were at that time, approximately, 1.000 manufactories of agricultural im plements in the United States, the amount invested in this line of manufacture being nearly $\$ 150,000,000$, the average number of persons employed in it being 45 , 000 , the materials used averaging in value $\$ 30,000,000$ and the output $\$ 80,000,000$.
Since the summer of 1893, the American trade in agricultural implements has been subjected to a marked prostration. The export trade of the country in agricultural implements has continued large and has even increased

| 1893 (fiscal year). | 000 |
| :---: | :---: |
| 1899 (fiscal year) | 5,027,000 |
| 1895 (fiscal year). | 5,410,000 |
| 1896 (fiscal year) | 5,176,000 |
|  |  |

The Argentine Republic has been the chief cus tomer of the United States in this item of manufac ture, and the South American countries and West In dies have been customers to a smaller extent. But while the foreign market has continued, the home mar
ket for American agricultural machinery has been curtailed greatly, in consequence of the failure of some crops, the diminished prices for cereals, the accunulation, West and South, of mortgages and the ontraction of credits to farmers, who, as a rule, buy their agricultural machinery on credit, payment being predicated on the success of the crops and of paying prices for them. As a result of the agricultural depression in the West in $1893,1894,1895$, and 1896 , it is
hardly too much to say that the farming implements hardly too much to say that the farming implement used during the past five year
have been literally wearing out.
The large concerns have been carrying their customers on credit, and, with large debts outstanding, the farmers, generally speaking, have been awaiting the return of better times and better prices. The favorable conditions of a year ago were not without their effect on this branch of business, and those of this year are
being reflected in the enlarged market for farming machinery, reapers, thrashers, plows, rakes, binders cythes, and harrows.
At the head of the States of the country in the vol ume of its manufacture of agricultural implements is Hinois, with an invested capital of nearly $\$ 60,000,000$ Ohio follows, then New York, and then Wisconsin Ohio supplies most of the Southern market of demand and New York, the Middle, and Eastern States. Of
recent years California has developed its manufacture of farming implements largely.

## Brick Monuments.

Brick," an excellent trade journal devoted to th clay industries, recently published an interesting pho tograph of a monument which seems to open a new future for brick and at the same time will tend to re lieve the granite and marble monotony of our cemeteries. The monument consisted of a square pier 33 inches square at the base, 7 feet high, and resting on a brick with marble triumings and four braced At the top is a series of steps capped by a marble cover, finished with an urn. The base is built of brown rock faced brick outside and brown smooth-faced brick in-
side. A monument of this kind could be easily erected
anywhere in the country, and the designs for such nonuments would be almost limitless. Of course, a granite or marble monument of considerable size can only be carried to cemeteries and erected with considrable difficulty and expense ; so, if for no other reason, he brick monument is interesting on account of the portability of the materials. The enduring quality of brick when properly laid ought to commend the idea at once.

## The Current Supplement.

The current Supplement, No. 1190, contains a num ber of papers of remarkable interest. The first in importance is, without doubt, the "Ghost Dance," an article specially prepared for the Supplement by Cosmos Mindeleff. It is particularly timely at the present day, as there has been an outbreak by the Indians in the Northwest. The article is illustrated by five en gravings from reports of the Bureau of Ethnology "The Discovery of New Chemical Elements," by Clemens Winkler, is a most interesting and important cheens Winkler, is a most interesting and important che-
mical study, especially when taken in connection with mical study, especially when taken in connection with
another article which is published in this issue-C. F. another article which is published in this issue-C. F.
Brush's "A New Gas." This is a full paper, which Mr. Brush presented at the American Association for the Advancement of Scince, on "Etherion." "Excavations at Corinth" is an interesting paper by Prof. Rufus B. Richardson, director of the American School at Athens. "Electroplating on Wood" is an article giving full formulas. "The Inaugural Address" of Sir William Crookes before the British Association is concluded in this number.


## recently patented inventions. Bicycle applances.

BIC YCLE-HOLDER. - DAVID A. Brown, Wood bridge, N. J., and Frank M. Williams, Belleville, N. Y. By providing a bicycle-support comprising a loop forwardly curved at its upper portion and mounted
to swing on a vertical wall, an arm extended from the ower end of the loop, and a frame-engaging plate on the arm, these inventors are enabled to hold a oicycle securely against tbe wall of a building, baggage-car, or the
like. When placed in the holder, the front wheel of the like. When placed in the holder, the front wbeel of the
bicycle rests upon the loop. the frame-engaging plate pporting the bicscle free from the floor
bic ycle. - Philip J. Parker, New York city. This bicycle belongs to the chainless type and is so constructed that the driving power is directed from
the center of the pedal-shaft and not from the side. By he center of the pedal-shaft and not from the side. By
this means the inventor claims that the strains on the wo sides of a bicycle frame are equalized and that a much larger driving-gear can be used than has hitherto been possiile. By having the rear wheel at one side of a line drawn from the front wheel, three gear-wheels mas be used, the least number that can be employed,

Engineering Improvements ROTARY ENGINE.-JAMEs C. Walker, Waco, Tex. This invention embodies an improvement whereby of abutinent-silides and inlet-valve devices forming part
angine, patented by the same inventor may be more efficiently operated. The engine comprises a nest of cylinders. On the drive-shaft the disks which carry the cam-devices for operating the abutment-slide valvee are fixedly mounted. For the cylindersa cut-off valvemechanism 18 provided. Leverdevices are employed to $\ddagger$ roduce
a reciprocating action of these valve-mechanisins. On a reciprocating action of these valve-mechanisins. On
a drive-shaft geared with the main drive-shaft, centrifu-gally-operated cut-off devices are mounted and held to engage and impart a reciprocating action to the valve-shifting-lever devices.

## Mechanical Devices

drilling-Tool.-Wililam h. Skinner, Darlington, La. Within the casing of this tool a bit-stock is mounted to rotate and is provided witb a socket-end. In tbe end of the bit opposite the socket-end, a feedtwo grooves below the point. Over the end of the feedscrew a cap is fitted in whict a set-screw is located and adapted to enter either of the grooves to cover or expose the centering point.
GIRDER-RAIL GROOVE-CLEANER. - Lours F.
MEYER, Richmond, Va. This device comprises a laterally. Mever, Richmond. Va. This device comprises a laterallymovable plow and a brush located in the rear thereof and held from lateral movement, the brush being arranged to run directly behind the plow when the latter is in nor-
mal position, as when cleaning a straight rail. This mavention, it is claimed, will dispense with the services of a force of rail-cleaners and perform the work more
thoroughly than is ordinarily accomplished by hand. GRINDING AND PULVERIZING MACHINEJohann Poettaens, Berlin, Germany. One of the distinguishing features of this machine is the novel shape
of the inner wall of the stationary "drum " or chamber of the inner wall of the stationary "drum "or chamber
inclosing the grinding or pulverizing mechanism. Tbe these are adapted to act by centrifugal force upon or in conjunction with the non-circular inner surface of the
tegrated alternately by attrition and pounding, is also
noteworthy. In addition to this, the beaters may openoteworthy. In addition to this, the beaters may ope-
rate under the action and control of spriugs designated to fulal the double object of increasing the effect of the bea
coil.
excavator. - Newbome C. Wright, Nashville, Tenn. This apparatus is especially adapted for use in excavating foundations. sewers, ditches. and the like, and ing mechanism is mounted and a longitudinally-extend ing guidewar, hoisting-line, a backing line, and a line for operating the block-frame are provided and connected with their respective drums on the hoisting-mechanism. The inventor has also provided means by which the scraper may be filled and dragged to the hoisting devices. After baving been filled the scraper will be elevated and swung to any point, ing line.
tire-setting machine. - Christian mathigEN, Frederickeburg, Tex. The purpose of this inven-
tion is to provide a machine wherebs a tire quickly set cold a moun a rime whereby a tire can be quickly set cold upou a rim. The machine has a
lever adapted to be temporarily fulcrumed at the hub of a wheel. On the lever a roller is journaled and adapted to engage the inside of tbe tire. A bearer is
also journaled on the lever and adapted to eogage the also journaled on the lever and adapted to eogage the
edge of the tire. On a slide, adjustably held on the lever, a second roller is journaled and adapted to engage the peripheral surface of the wheel rim. Means are provided for moving the slide on the lever
KNITTING-MACHINE.- IsAAC W. LAMB, Perry, designed to knit fabrics the selvage yarn of composed of two ribbed fabrics, tween the front and back loops of the selvage of the other fabric to form the two in one piece. The machine is provided with needle-plates on which sets of needles sponding sets of needless carry the yarn to the correbetween the two sets of needles on one of the needleplates to join the fabrics formed by the sets of
needles. Means are provided for imparting movement needles. Means are provided for imparting movement
to the sets of needles and to the sewing-needle. Me chanism is also provided for shifting the sewing-needle from one of the carriers, without causing the sewing needle to cast its old loop.
MACHINE FOR SORTING FRUIT OR VEGE-TABLES.-A. O. Dilluman, South Haven, Mich. This fruit-assorter bas an assorting roll provided with a gravity blade having movement to and from the periphery of the roll. An assorting table having a hinged section is
arranged for contact with the blade wben the blade extends beyond the periphery of the roll. The fruit is fed therein assume a vertical position. The mouths of the spaces being appermost, the fans or blades will drop down into the spaces; but when the mouth portion of the spaces on the assorting rolls faces downwardly the blades drop out. As the rolls continue to revolve, the fruit that has heen unable to pass between the rolls will be taken and carried to the nest roll between which the space is
wider.
CLOTH-CUTTING MACHINE.-Nicolas Komow,
New York city. In this cloth-cutting machine an elecNew York city. In this cloth-cutting macbine an elec ble cutter journaled in a hollow standard. The driveshaft extends down into the hollow standard and is pro
vided with a beveled; pinion on its end. A beveled ge
is mounted in the hollow standard and engages the be eled pinion of the motor shaft. The cutter is secured to and revolves with the gear-wheel. When using
this machine the operator has a clear view of the cloth this machine the operator has a clear view of the cloth sired line.
GEAR-CU'TTING MACHINE.-Nelson A. WherlER, Stockton, Cal. With this machine a great variety of adjustments can be made, so that gear-teetb of various
types can be cut therewith. With the work-holder a cutter-guide is connected, the axis of which is arranged at an angle to that of the work-holder. The cutter is mounted to reciprocate on the guide. The guide is adjustable on a bracket transerersely of the direction in which the cutter reciprocates, the bracket heing pivotally mounted to permit tts angle to be changed relatively COIN-COUNTER
COin-COUNTER. - Charles J. Wolf, Memphis, Tenn. This invention is an apparatus for receiving
money and for making change automatically, both operations being effected apon striking a key denoting the amount of the purchase. On the base of the machine is situated a casing which is flanked on each side by two small drums. The casing contains devices for receiving the coins and expelling the change thereof. The drums are constructed to receive the paper notes, and upon the action of certain elements, to permit the estraction of
the requisite change in paper money. The coin devices the requisite change in paper money. The coin devices
comprise a coin-stack for each denomination, each stack having keys aud ejectors to control and push out the several coins. The arrangement is such that, upon inserting the money tendered in payment for goods received into the machine, and upon striking a key denoting the amount of the bill or purchase, the amount of money representing the change will
money receptacles of the apparatus

## Mincellaneons Inventions.

HOLDER FOR NURSING-BOTTLES.-ALEXANDER C. Buck, Jamesburg, N. J. This holder has a base provided with a contracted front portion extended ap-
wardly to form a standard. A spring-lug is located at wardly to form a standard. A spring-lug is located at
each side of the base. Another spring-lug is located at the rear portion of the base. These lugs support the neck of the bottle extends.
HEN's NEST. - Mino S. Barnes, Garner, Iowa. The hen's nest provided by this inventor is so arranged and fingers close up behind her, thus preventing the en trance of a second hen. When the hen desires to leav the nest, she steps upon a platform, which action causes
the fingers to fall and raises the box ready for action second time.
SAFETY ATTACHMENT FOR FIREARM-LOCKS Orlando Rose, Crown Point, Ind. The purpose o his invention is to provide an attachment for guns o moved to explode the cartridge before it is fully cocked The movement of the hammer to a full cock bring a trip-lever ander the locking or safety-lever to hold it out of the path of the hammer, the hammer oper ating the trip-lever to free the safety-lever.
RACE-TRACK FOR DOGs RACE-TRACK FOR DOGS. - Michael Walei New York citr. With this improved track the speed of
dogs may be tested in such a manner that the animals are completely unencumbered by harness or the like.
Movable in the track is a support adapted to carry a Movable in the track is a support adapted to carry a
dummy hare or other object in view of the pursuing dogs.

The support is moved forward in front of the dogs by
FUR-TRIMMING FOR LADIES' HATS-JoEn $F$. Vorce, New York city. The fur feathers comprising this hat-trimming consist of ur quills and a core
therefor, and a base to which the inner ends of the feathers are secured
game-apparatus. - Henry T. Prcroft, Parnell, Auckland, New Zealand. In this apparatus, two
boards are mounted on a basea and adapted to be inboards are mounted on a base and adapted to be in-
clined oppositely. A cage is mounted at the upper end clined oppositely. A cage is mounted at the upper end
of each board. In using the apparatus, balls are first placed in the cages. At a signal, the players, two in number, simultaneously release the balls. Then with an arresting instrument the players each endeavor to stop the balls. When a ball is arrested, the player scores as many points as tbere are units marked in the place
where tbe ball has been stopped. Should the ball, howwhere the ball has been stopped. Should the ball, how-
ever, be not arrested, it rolls into one of several comever, be not arrested, it rolls into one of several com-
partments. The number of units marked in the compartment in which the ball has come to rest denote the number of points scored by the opponent of the player who has been unsuccessful in arresting the ball.
attachment For shoes.-Robert M. hatward, New York city. The inventor of this attachment arranges a strip of yielding material within the shoe or boot at the side occupied by the big toe The strip is designed to keep the toe in its
to prevent the formation of "bunions."
broiling and toasting device.-Ella m. alderson, Asbury, W. Va. Thie broiler and toaster carrier-rod paesing tbrough the end walls and halsing handles on the ends which frictionally engage these
walls to prevent accidental rotation, and a series of walls to prevent accidental rotation, and a series of spaced hanger-fingers on the hanger-rod, adapted to re-
ceive and hold material to be broiled or toasted, by hanging the material on the pointed ends of the
Barrel.-Merrill H. Tilaham, Norfolk, Va. The head of this barrel is composed of a number of sections overlapped at their ends, curved at their oater sides to fit the barrel and provided with an open space between
their inner edges adapted to pernit the ineertion of their inner edges adapted to pernit
truck and to be closed by a cross-siat.

## Designes.

match-box. - James J. B. McElrath, Centre, Ala. The match box forming the subject of this design
has a shield-like body, surmounted by a compass, the lower ends of the legs merging into the shield. A square crueses the compsses and connects with the central upper portion of the shield. Between the square and the com pass the letter -
Fabing feaure of this Keil, New York city. The leading feature of this design consists in a striped body
and panels into which the stripes merge, and in floral decorations for the border thereof.
Fabric.-Wminam KeIL, New York city. This design provides a fabric baving a body and a border. The body has alternate checkered and foliated stripes. The
border is separated from the body by an ornamental bar border is separated from the body by an ornamental bar and is decorated with foliate cruciform figures, alternat-
ing with spire foliate figures. The border is further deing with spire foliate figures. The border is further de

## pieces.

Note.--Copies of any of these patents will be furnished by Munn \& Co. for 10 cents each. Please send
the name of the patentee, title of the invention, and date of this paper.

