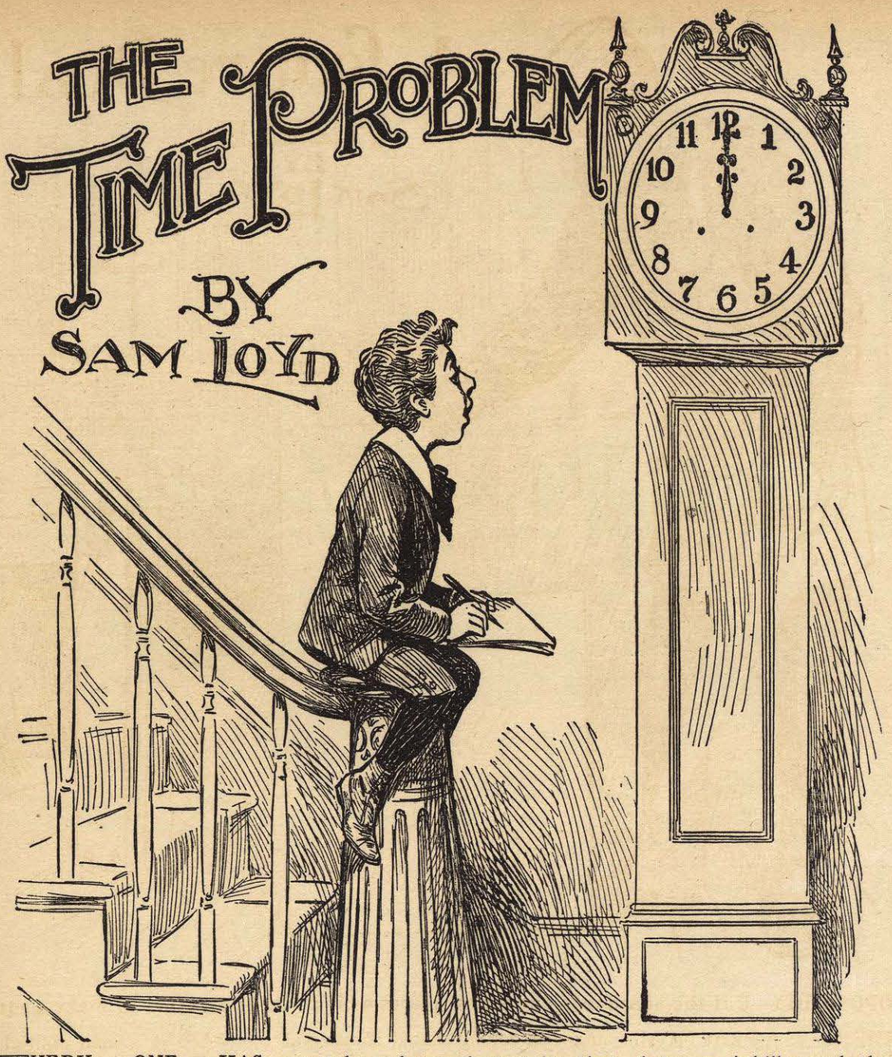
THE TIME PROBLEM

BY SAM LOYD



EVERY ONE HAS read about the race between Achilles and the tortoise, so often quoted as showing the impossibility of doing some possible things.

Achilles could walk twelve times as fast as the tortoise, so a match was arranged by Zeno, the philosopher, wherein the tortoise was to have twelve miles start. Zeno maintained that Achilles could never overtake the tortoise, because while Achilles walked twelve miles the tortoise would have advanced one mile, and when Achilles went that mile the tortoise would have gone on the twelfth of a mile, etc. etc.

The story is erroniously quoted by many upon the supposition that while it is evident that Achilles will overtake and pass the tortoise, that the exact point would be represented by an indeterminate fraction which cannot be computed, but goes on diminishing forever like the decimal value of a seventh. A problem of that nature would be represented by the traveler who journeys from Bagdad to Jerico, agreeing to go half the distance on the first day. The next day half of the remaining distance. The third day half the remainder, etc., etc., always going just half as far as he did the previous day—the result being that he gets very close, but never gets there.

The race of Achilles and the tortoise, however, differs in that he does get there and passes the tortoise, but the difficulty is to determine the exact point.

Tommy noticed that the race between Achilles and the tortoise represents the relative speed between the hour hand and the minute hand of a clock, so he secures a post of vantage and determines to solve by actual observation a time problem often quoted as unsolvable.

Exactly at 12 o'clock noon the hour and minute hand are together, and the problem is to discover the exact time which the next meeting of the hands represents. As a matter of fact it is a most interesting puzzle which mathematicians recognize as forming the groundwork upon which numerous time problems of an important and fascinating character have been built, for which reason a clear understanding of the principle involved is recommended.

A Square Deal

PUZZLE BY Sam Loyd

PROPOSITION—Cut the board into the fewest pieces which will fit together to make a square.

HERE IS A PRACTICAL problem from the workshop which shows the advantage of ingenuity and mechanical skill. The carpenter had a fine piece of board which, as shown in the sketch, contains eighty-one squares of the size of the smallest. That is, if the smallest square represented 1 inch, the next would be 16, and the larger 64, making in all 81. He wants to make a perfectly square shutter for his window, 9x9, and, as there is no material to spare, he aims to divide it into the fewest possible number of pieces which will fit together and form a perfect square.

A glance at the board will give you a picturesque idea of the values of gold, silver and copper as formerly advocated in Nebraska, in the ratios of 16 to 1 and 64, with a mixed or amalgamated copper valuation of 91. From a mathematical standpoint you may learn much in an experimental way regarding the relationships of squares as shown between 1, 16, 64 and 91, which is one of the fascinating features pertaining to the mysteries of square numbers.

Why are cats like unskillful surgeons? Because they mew till late and destroy patience (patients).

Why is a youth trying to raise a moustache like a cow's tail? Because he grows down.

Why is this continent like milk? Because it's ours (it sours).

How may book-keeping be taught in a lesson of three words? Never lend them.

What trade is like the sun? A tanner's.

When is a man obliged to keep his word? When no one will take it.

Why is an attractive woman like a successful gambler? Because she has such winning ways.

Why are stout men usually sad? Because they are men of sighs (size).

Why are two young ladies kissing each other an emblem of Christianity? Because they are doing unto each other as they would that men should do unto them.

What is the color of the winds and waves in a severe storm? The winds blew (blue), the waves rose.

Why is a baker a most improvident person? Because he is continually selling that which he kneads himslf.

Why is a ssupid fellow like G sharp? Because he is A flat.

PROPOSITION—If the moon was made of green cheese, into how many pieces could you divide it with six straight cuts of a knife?

SPEAKING ABOUT the possibility of treating disease through the influence of will power,'' says a noted specialist in a recent contribution to a medical journal. ''I wish to say that in Switzerland the power of imagination is so strong among the wild montain swine herdsmen that they will eat their sour brown bread with great relish through believing that they get slices of cream cheese from the moon! They actually go through the motions of cutting the air, and like little children quarrel over imaginary portions.'

''Nevertheless,'' he added, ''it was plain to be seen that they were in no way benefited, so far as the putting on of flesh was concerned, by their delusions.''

Not being interested in the Cristian Science side of the question, I was merely struck by the suggestion of an odd puzzle proposition arising among those peasants as to the possible number of pieces of cheese. Therefore, indulging the fooish fancy of those men as shown in the sketch, let us suppose that the expert carver of the party is speculating as to the greatest possible number of pieces into which he can divide the moon with six straight cuts of a knife. The wild luncheon party are unfortunately reduced to short rations in having the last quarter of the old moon to feast upon, so they are trying to make the most of it. Are you clever enough to help them?

With a pencil and ruler mark off the pictured moon with six straight lines and see how many pieces you can produce, and if you guess it correctly you will note a difference between this and the famous problem of the Boarding House Pie, as well as the cheese problem which introduced other geometrical principles.

An Oriental Love Story.

He said I was beautiful, he did, I assure you; and I know he was right, for my skin was as soft as satin and white like ivory, my figure slender and elegant.

Our first meeting was in a shop, and he made no attempt to disguise his admiration. He praised me up to the skies and called me ''very dear.'' From that day and for many months we were inseparable. I occupied all his thoughts.

Again and again he gazed with indescribable affection at my wonderful complexion, my graceful figure, and pressed me to his lips.

His embrace was tenderness itself, and whenever some trifling accident marred my beauty—if only for a day—his anxious solicitude knew no bounds. At night I rested on velvet pillows, and by day I accompanied him wherever he went.

He always enjoyed my society, even when nothing else afforded him pleasure.

He would turn to me, and not in vain, for comfort and relief when all other friends proved faithless. Oh! why was it not fated to be ever thus?

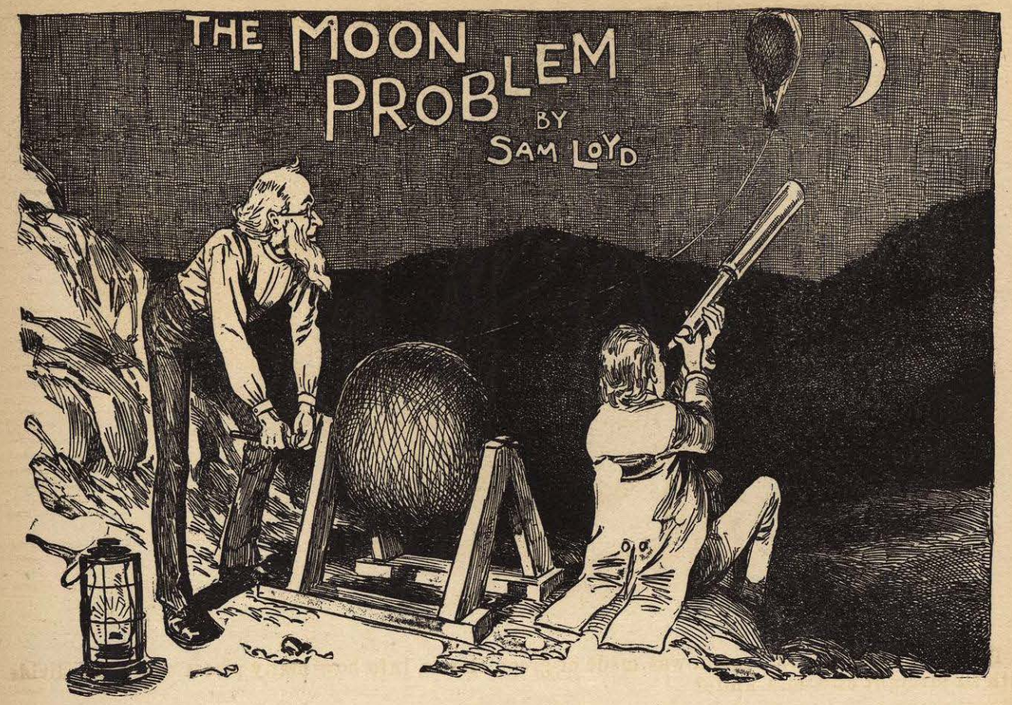
Alas! one day in a public thoroughfare I had a heavy fall, and, though it was through his fault, I was never the same to him as before. This cruel misadventure fairly broke me down. True, he endeavored afterwards to make amends for his harsh treatment.

He treated me with the greatest consideration and loaded me with silver; but the light of former days had gone out.

He tried to leave me as before, but in vain; his feelings had undergone a complete change, and now I am nothing but a miserable wreck of my former self.

Here I lie, all alone in my sorrow, a forsaken, broken—?

This story, which will be ''continued in our next,'' is to be completed by the use of one word. How many of our puzzlists can guess the word which will prove to be a key to the whole mystery?



PROPOSITION—How much wire is there in a ball 24 inches in diameter if the wire is 1-100 of an inch thick?

THERE IS A CERtain irresistible Fascination about investigating the affairs of the moon which few can resist, so when the famous Moon Hoax was sprung upon the public during the early part of the last century it was shown that the people were prepared to believe almost anything. It was based upon the alleged powers of a marvelous telescope which, it was claimed, would enable us to see the smallest articles upon the moon's surface. The public seized upon the reports with such credulity that the projectors of the hoax gave vivid descriptions and pictures of the inhabitants of the moon and their wonderful surroundings, so skillfully presented that despite of their extravagant claims were believed for a long time.

The surmises regarding the state of affairs on the moon has been a popular fad with theorists and writers from time immemorial.

Aristo, in his ''Orlando Furioso,'' sent Astolfo on his venturesome trip four centuries ago, and the wonderful stories of what he saw in the ''Valley of Lost Things'' among the hills of the moon deceived many. Cyrano de Bergerac's voyage to the moon is one of the most amusing contributions to modern literature, but Jules Verne's account of an aerial trip is the most thrilling of the many lunar legends. The quickest journey of record, however, is that of Edgar Allen Poe's hero, Hans Pfeel, of Rotterdam, who by means of a balloon completed the trip in nineteen hours. It was the detailed matter-o-fact account of this journey which so worked upon the brain of a learned professor named Spearwood that he fitted out an expedition, and actually undertook to make the trip, firmly convinced that at a certain distance he would pass out of the influence of the earth's attraction and pass into that of the moon.

My sketch is drawn from a description published at the time of his ascent, but as the puzzle has nothing to do with the adventure after he had cut loose from his earthly connections, I will say that a pretty problem is found to be involved in the data as given, which does not possess the difficulty which mathematicians would ascribe to it according to accepted methods. He had a ball of wire twenty-four inches in diameter, the wire being only one-hundredth of an inch thick. It looks like a difficult problem to tell the length of a ball of one-hudnredth inch wire, twenty-four inches in diameter, but as a matter of fact it is so simple that it yields readily to common sense, and I should like to see how close our puzzlists can come to guessng the length of wire, without going very deeply into the subject, and shall take occasion in giving the answer to present a simple demonsrtation practically devoid of mathematics, which any clever child might understand.

Just a Plain Sell.

''How do you pronounce T O?''

''Too.''

''And T O O?''

''Too.''

''And T W O?''

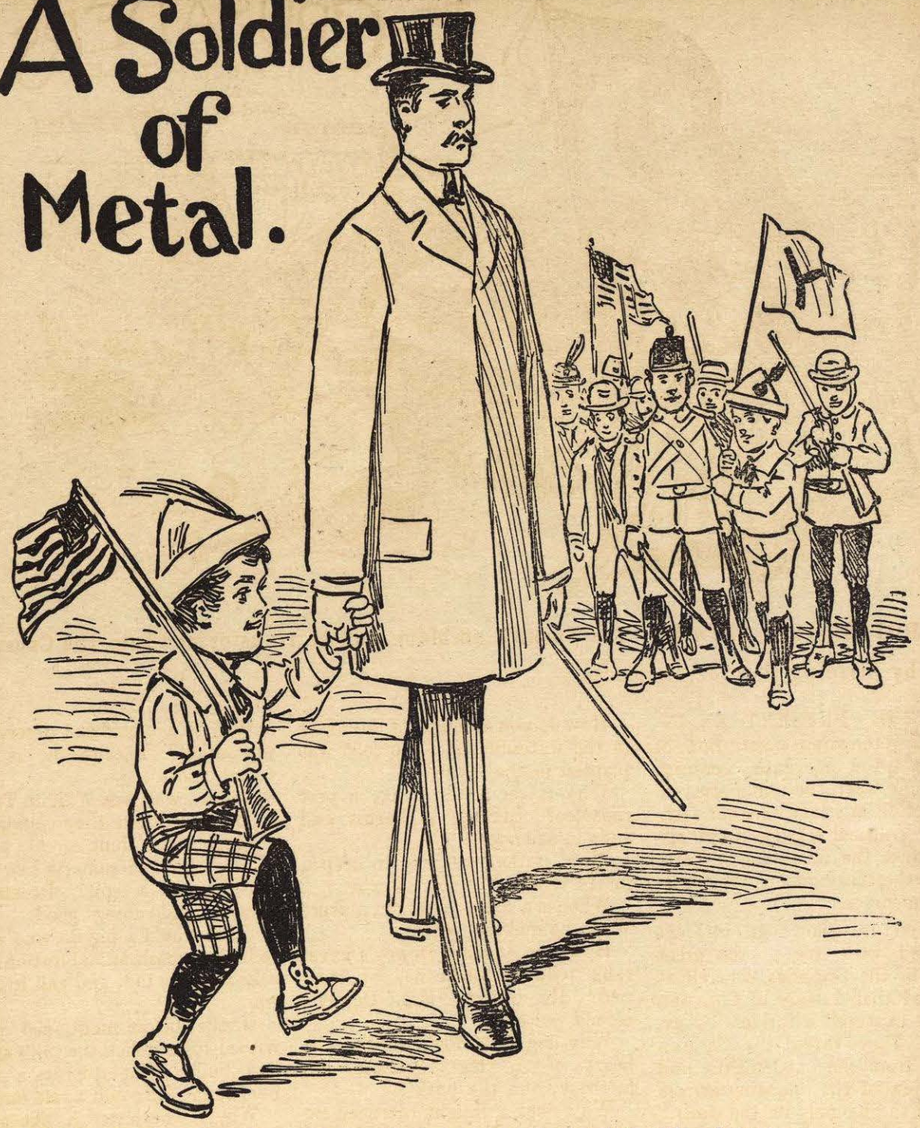
''Too, of course.''

''Well, how do you pronounec the second day of the week?''

''Tuesday.''

''Really, now, I always thought the second day was Monday.''

A Soldier of Metal.



PROPOSITION—Solve three conundrums connected with this picture.

AS RIDDLES AND conundrums are healthy exercise for the gray matter in the brain, we will ask our young puzzlists to guess this pack of seasonable conundrums which were fired off during a celebration of Independence day. It appears that Harry who was taking a walk with his father, asked why that boy had the letter Y on his flag, and the boy who heard this remark asked another boy why that high-stepping kid was a soldier of metal.

Then the father, who knew all of the boys, asked them why the Fourth of July was like an oyster stew; so we now ask you to answer all three questions.

A CHARADE.

My first will deny the most trifling demand,
My next is what sadly disgraces the land;
My whole, be his station exalted or mean,
Does not to distinction in science attain.

Cypher Ans. 14, 15, 22, 9, 3, 5.

A REBUS.

When the wintry tempests roar,
Hoarsely round the cottor's door,
My cheerful whole its comfort lends,
And for his labor makes amends;
Curtail, and you perhaps may see
That good or ill proceeds from me;
Fountain of virtue or of strife,
I cheer or sadden mortal life!
The extreme letters sweep away,
And I'll receive whate'er you say.

Cypher Ans. 8, 5, 1, 18, 20, 8.

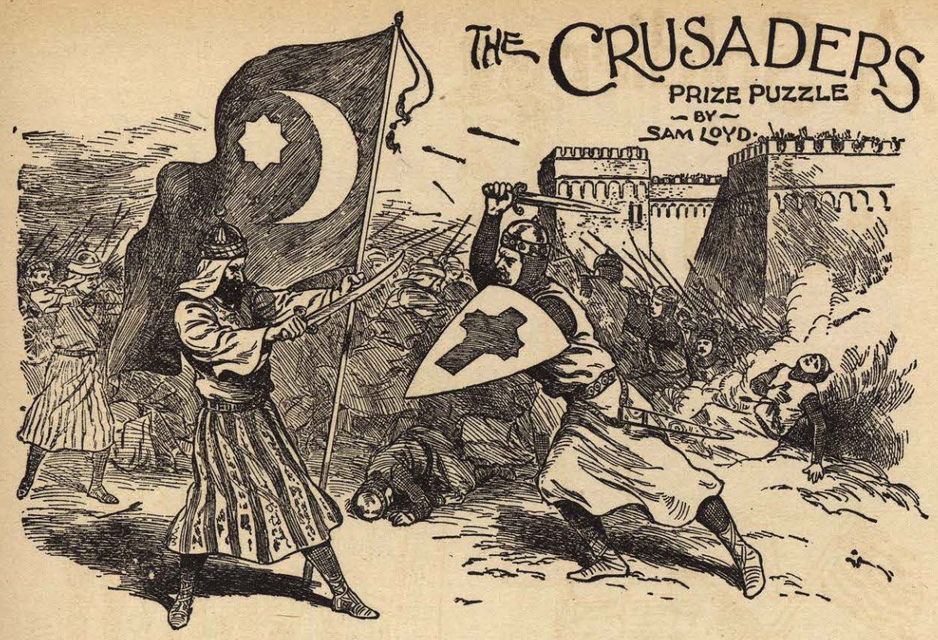
What is the difference between a postage stamp and a lady? One is a mail fee, and the other a fe-male.

THE CRUSADERS

PRIZE PUZZLE

—BY—

SAM LOYD.



PROPOSITION—Show how the Turkish emblem may be transformed into the Crusader's Cross by dividing it into two pieces.

WE PRESENT AN INteresting illustration of the eleventh century, when the noble army of Christians were not withheld by political reasons from rising against the unspeakable Turk, to stop the massacres of the Christian Armenians.

The picture shows an incident connected with one of the great battles of the Crusades, wherein it is related that a body of Christian Knights captured a fortress by assault. "They threw the Saracen soldiers from the battlements, and in full view of the opposing armies changed the banners on the walls."

The story as told would seem to imply that there is a simple way of converting the Mahomedan flag into that of the crusaders, for which reason we place in the foreground a Saracen soldier defending the well-known Turkish ensign against the assault of a knight, upon whose shield may be seen the crusader's cross.

Draw a representation of the Turkish flag, as shown, and then cut out that part which contains the white design, and then in the simplest way, and by cutting into the fewest possible pieces transform the Turkish design into the crusader's cross, as shown upon the shield.

How do you account for the water in the watermelon? The seed was planted in the spring.

Why is the letter S like a pert repartee? Because it begins and ends in sauciness.

What is the best way to keep a man's love? Not to return it.

When is a soldier a wagon maker? When he makes a wheel.

How was Admiral Dewey's naval rank reduced when he got married? He became Mrs. Dewey's second mate.

Why is a little dog's tail like the heart of a tree? Because it's farthest from the bark.

Why does a freight car need no locomotive? The freight makes the car-go.

What is that which is put on the table and cut, but never eaten?

A pack of cards.

Why may not the proprietor of a forest fell his own timber? Because no one is allowed to cut when it's his own deal.

What is the difference between twice twenty-two, and twice two and twenty? One is forty-four, and the other twenty-four.

Tell a man to write down, without hesitation, in figures, twelve thousand twelve hundred and twelve dollars? We hope he will do it correctly. Thus: $13212.

Why is a blockhead deserving of promotion? Because he is equal to any post.

Tell us, why was William Tell like a post? Because they couldn't get a bough out of him.

Why is a missionary like a pig roasting on a spit? Because he goes around doing good.

What would a pig do who wished to build himself an habitation? Tie a knot in his tail, and call it a pig's tie.

If the before-mentioned porker wished to demolish the pig's stye he had built, what quotation would he make? "I could a tale unfold!"

Why is the letter K like a pig's tail? Because it's at the end of pork.

Why are hogs more intelligent than humans? Because they nose (knows) everything.

How do you spell "blind pig" in two letters? P G—pig without an I.

Why is a hog in a parlor like a house on fire? Because they both want puttin' out.

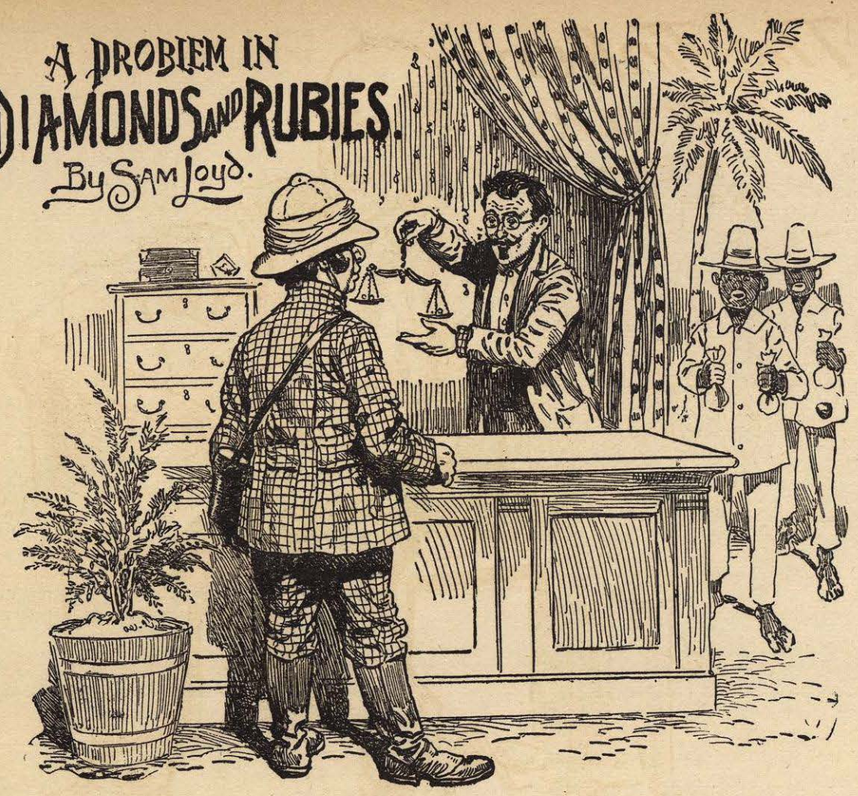
Why is a magnificent house like a book of anecdotes? It has generally some good stories in it.

What prevents a running river running right away? Why, it's tied up.

What river is ever without a beginning and ending? S-ever-n.

A PROBLEM IN DIAMONDS AND RUBIES.

By Sam Loyd.



PROPOSITION---Guess the size of the two stones of different sizes which he exchanged for a pair of ear rings of a uniform size.

IT IS WORTH KNOWing that the value of diamonds increases in worth according to the squares of their weight, while rubies increase according to the cubes of their weights, viz., if a fine diamond of one karat is worth $100, a two-karat stone of the same quality would be worth $400, while a three-karat gem of equal purity would be worth $900. If a fine Oriental ruby of one karat is worth $200, a two-karat stone would be worth $1,600. It is well to remember that we are discussing gems of equal purity and brilliancy, for the size of a stone is not so important as the quality. A one-karat stone is often more valuable than others of two and three times the size, so that only an expert in the matter of color and purity can give even an approximate value, despite the marvelous accuracy of the scales employed by the trades. A noted merchant, who is familiar with the diamond mines of Brazil, Cape Colony and other quarters of the globe, showed me a pair of earrings which he had exchanged for two stones of different sizes.

Upon the basis of a single karat being worth $100, as explained, who can guess the size of the two stones of different sizes which he exchanged for a pair of ear rings of a uniform size. Of course there are mnay answers to the puzzle so you are asked to find the smallest possible size of two stones which represent the value of two of different sizes without employing fractions of a karat.

Why is a younger brother like a fair complexion? Because he is injured by the son and heir.

Why is a tradesman like a divinity student? Because he studies the prophets.

What of all things in the world is the longest—and the shortest; the swiftest and the slowest; the most divisible and the most extended; the most neglected and the most regretted; without which nothing can be done; which devours all however little, and ennobles all that is great? Time.

Why is magnetism like the police when most needed? Because it is an invisible force.

When is a square field not a square field? When it is a rye field.

Why is a fish hook like the letter F? It makes an eel feel.

What is invissible but never out of sight? The letter I.

When is a boat like a knife? When it is a cutter.

What part of London is in France? The Letter N.

Why is a rosebud like a promissory note? It matures by falling due.

What two reasons might be given to prove that a bride is erring? She is mistaken and miss-led.

What is the best key to a good dinner? A turkey.

When is a pig's tail like a carving-knife? When it is flourished over a ham.

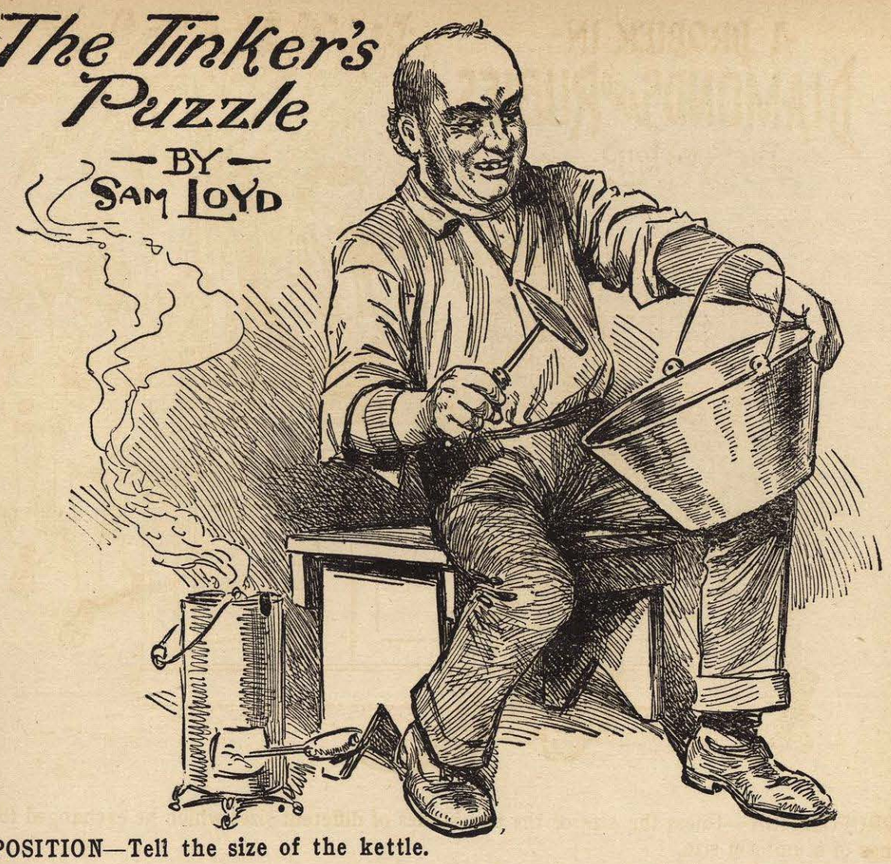
Why does it fatten a chi'd to drop it? Because it comes down plump.

How did a blind man pour out his tea? He took a cup and saw sir.

The Tinker's Puzzle

—BY—

SAM LOYD



PROPOSITION—Tell the size of the kettle.

CATERING TO THE mathematical bent of the many who revel in geometrical problems and abtruse calculations I shall take occasion to call attention to that jingling bit of Mother Goose which appears to contain a somewhat pretty problem.

The old song says:

"I agreed with a tinker whose name
was Doo-little
To make for my aunt a flat-bottomed kettle.
Twelve inches exactly the depth of the same,
And twenty-five gallons of beer to contain.
The inches across at the top would show
Just twice the width, as measured below.
So tell me that width, across at the top,
For auntie now wants a lid from the shop."

There is nothing required to be added to the above data, so we will just see how many of our methematicians can give us the diameter of the required lid to fit on the kettle, which is twelve inches deep, and will hold just twenty-five gallons.

Why is a railroad track a particularly sentimental object? Because it is bound by close ties.

What is society composed of? A mixture of mister-ies and miss-eries.

What is taken from you before you get it? Your portrait.

When is a man's friendship most severely tried? When he stands a loan.

What melancholy fact is there about a calendar? There is no time when its days are not numbered.

What is the best food for dyspeptic people? Oysters; because they die-just (digest) before they are eaten.

Why is a distanced horse like a man in a shady place? Because he is out of the heat.

Do you know what is the oldest piece of furniture in the world? The multiplication table.

Why is a kiss like a rumor? Because it goes from mouth to mouth.

When are soldiers best able to draw blisters? When they are mustered in the service.

Why is the woodsman's ax an inconsistent weapon? Because it cuts a tree down and then cuts it up.

Why is an inn-keeper like a multitude of people? Because he is a host himself.

Why is the blush of modesty like a little girl? Because it becomes a woman.

Why is a bad epigram like a useless pencil? Because it has no point.

If you see a counterfeit coin on the street why should you always pick it up? Because you may be arrested for passing it.

What key opens the door to the penitentiary? Whis-key.

Why is a pig with a curly continuation like the ghost of Hamlet's father? Because he could a tail unfold.

Why is a plowed field like feathered game? Because it's partridges.

How would you make a tall man short? Borrow money of him.