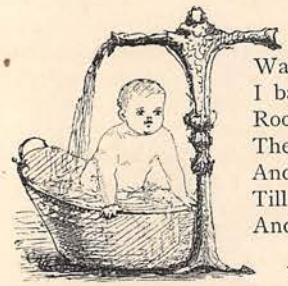
## MASTER THEODORE.

BY OLD NURSEY.



LITTLEBAT TITMOUSE THEODORE VAN HORN
Was the prettiest baby that ever was born.
I bathed him and fed him and taught him "Bo-peep,"
Rocked him and trotted him, sang him to sleep.
Then I bade him good-by, and crossed the wide sea,
And it rolled twenty years 'twixt that baby and me;
Till at last I resolved I would cross the blue main
And hug my own precious wee baby again.

Well, that old ship creaked, and that old ship tossed,—
I was sure as I lived that we all should be lost,—
But at last we saw sea-gulls, and soon we saw land;
And then we were in; and — if there did n't stand
My own blessed baby! He came there to meet me!
Yes, when we all landed, he hastened to greet me!
And wonder of wonders! that baby had grown
To be bigger than me, and he stood all alone!
"Why, Nursey!" he said (he could talk, think of that!),
As he bowed like a marquis and lifted his hat.
"Ah, how *did* you know your old Nursey? Oh, my!
You 've changed very much, and no wonder," says I;
When I spied of a sudden his mother, behind,—
Sweet lady! She 'd helped him Old Nursey to find.
And he told me, right there, he 'd a sweet little wife
And that I should live with them the rest of my life.

So I 'm here, and right happy. You just ought to see
The dear little fellow that sits on my knee.
He has beautiful dimples and eyes like his Ma,
And a nose and a chin just the same as his Pa.
Ah, me! He 's a beauty! There never *was* born
A prettier babe than this latest Van Horn.

## THE NEW LIGHT.

BY CHARLES BARNARD.

"IT 'S too bad that the fairies and giants died so long ago. It does seem as if all the wonderful things happened before there was a chance to see them. If a gnome or a nixie would appear in the woods near the fairy ring, and send word that it would do something, we could go to the telephone in the library, and tell all the boys and girls in the neighborhood to meet at the railway depot and take the train for the woods, so as to be in time to see. That would be something like! They have put an electric light on a tall mast near the Town Hall. They say you can see it from Perkins's Hill where the fairy ring was found, and that 's more than nine miles from the Town Hall. Perhaps if there were any gnomes or fairies there, they could see it. What do you suppose they would think about it? It is very bright, and it makes the streets look like fairy-land."

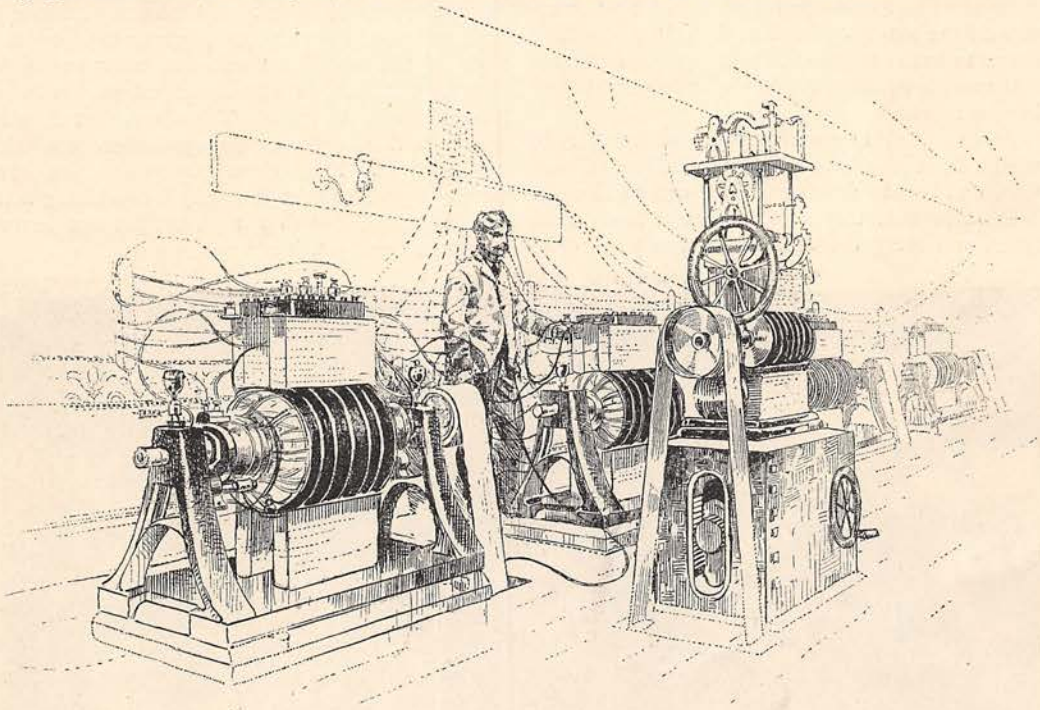
You see, the boy who made this long speech was a great talker. He certainly mixed things up in a strange fashion,—fairies and telephones, gnomes and electric lights. He was sure nothing

wonderful happens now, and yet he spoke of three things that leave poor Mr. Aladdin quite out of sight. What was the good of his old brass lamp? If you rubbed it well, you could fly away wherever you wished; but there 's nothing to show that even the wonderful flying carpet was half as fast as a train of cars. As for talking through a wire ten miles long, there is nothing like that in any fairy story ever written.

There are men and women still living who remember the time when there were no railways. It was at the Centennial Exhibition that the telephone was first shown, and some of you can recall the day the men brought the wires over the top of the house and put up that little box in the library. Now comes this mysterious electric light. It is queer and strange, bright as a small chip split off the sun, and they say the small white flame is so hot that it will burn up hard metals, like platinum, or tough stones, like diamonds. The gnomes never did anything like that, and, if they could do it, they never said so, or never took the trouble to try. Giants and nixies and gnomes don't amount to much, after all, nowadays.

It was Faraday who first saw the electric light. He was one day at work with his battery, trying experiments. He was continually trying things to see how they would behave. We call this "experimenting," and it is in this way that nearly all the strange new things were discovered. Faraday knew the battery would give him sparks and flashes of light. By trying the wires of the battery in a particular way, he found he could make the sparks stand still, while a great and wonderful light flashed up, burning and dazzling, before him. Franklin, you remember, went out one day, just as a thunder-shower was coming, and sent up his kite. The lightning ran down the kite-string and gave him a tiny spark from a key tied to the string. That was a famous experiment, for it proved that lightning and electricity were the same thing.

From Faraday's experiment we learn that a thunder-storm is a grand show, similar to the electric lights that shine in the streets. The lights in the clouds are not steady;—the lightning is not a good lamp to read by. Yet these three are the same—the sparks from the battery, the lightning from the clouds, and the new lamps in the streets.



DYNAMO-ELECTRIC MACHINES, WORKED BY STEAM, AND PRODUCING MAGNETO-ELECTRICITY. [SEE PAGE 570.]

Place a needle near the ends of a magnet, and it will be pulled toward it. If the needle touches the magnet, it will stick to the ends. Something draws the needle to the magnet and makes it cling. The attraction of the magnet for the needle we call "magnetism." We can see nothing of it; it has no light and no motion of its own. We can not hear it, and yet we know there is force of some

kind. This force that drags the needle to the magnet we call magnetism. In trying our experiment we have been, as it were, asking a question, as if we said, "Mr. Needle, what would you do if you met Mr. Magnet?" Mr. Needle is not very talkative, but the pointed way he has of clinging to Mr. Magnet speaks more loudly than words. Could he speak, he might say: "There is a force I must obey, and it draws me to the magnet. In nature there is a law of attraction, and in nature nothing ever breaks a law."

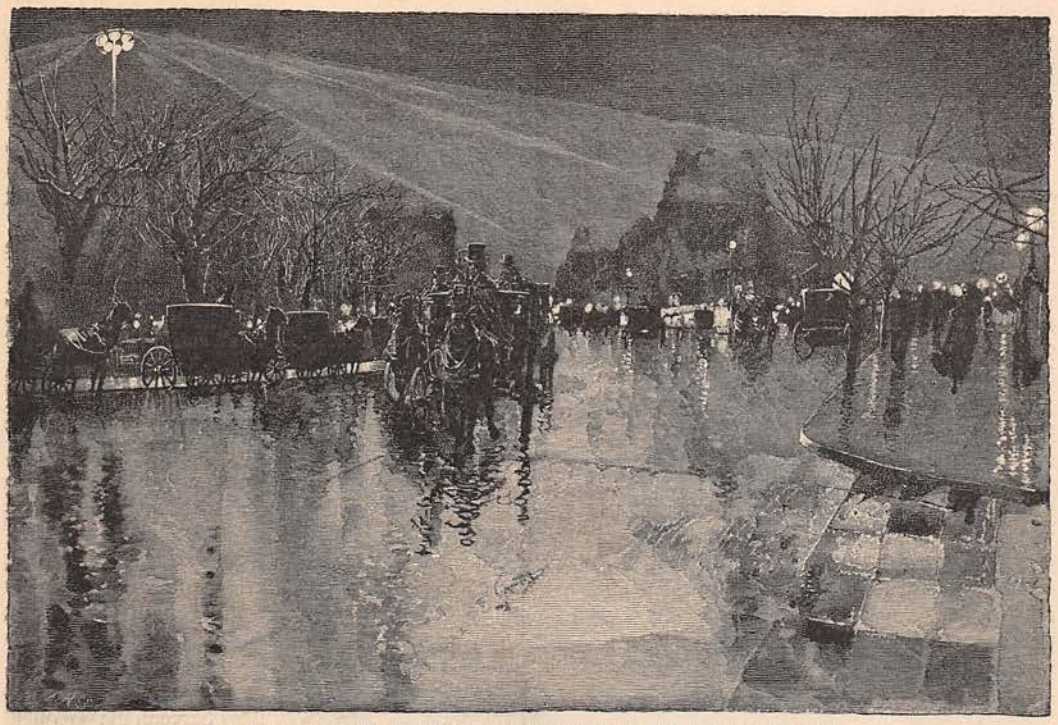
Put a two-cent piece in the mouth, on the tongue, and lay a nickel five-cent piece under the tongue, so that the edges of the two coins will just touch. In a moment you will have a curious bitter taste on the tongue. Neither coin by itself will have this taste. When the two pieces touch each other in the mouth, something happens besides their touching. You feel a strange, biting sensation on the tongue. Look at the coins. Nothing seems to have happened to them, yet you feel sure that something did take place when you held them in your mouth.

Another way to perform this experiment is to wind a short piece of fine copper wire around each coin, and then to drop them in a cup of vinegar. Take care that the bundles do not touch each other, and bring the ends of the two wires close together. Now, holding the cup in the hand, touch the ends of the two wires to the tongue. Again you feel the strange, biting, bitter taste. One wire does not have this effect, but, when both wires touch the tongue, something happens, for you feel it plainly. What does this experiment tell us? That here is force of some kind. This kind of force is called electricity. The coins on the tongue or in the vinegar make what is termed a "battery," that is, a fountain, of this force, and the taste on the tongue is caused by electricity.

If, in place of the coins, you use a sheet of copper and a sheet of zinc, each with its copper wire, and if in place of the vinegar a stronger acid, like sulphuric acid, is used, there will be more force, and the electricity will give us light and sounds. If the ends of the wires are brought together, there will be a tiny spark and a low sound, like the snapping of a bit of wood. There is nothing new to be seen or felt in the wires. They are cold and silent, yet, when they touch, they seem for an instant to be full of crackling fire. If the battery is a strong one, and you place a piece of paper between the ends of the wires, you will find after the flash that a small hole, with blackened edges, has been made through the paper. This shows that there is heat as well as light, for the spark burned a hole in the paper. From these experiments you can prove for yourself that electricity is something that can be tasted, and that it gives light and sound and heat; and yet, it can not be seen.

A RAINY NIGHT.—STREET LIGHTED BY ELECTRICITY.

At one time it was imagined that electricity was a kind of fluid, like water, and that it could, in some way, flow through the wires of a battery.



THE ELECTRIC LIGHT IN MADISON SQUARE, NEW YORK, ON A CLOUDY EVENING.

It is better to think that electricity is merely energy displaying itself; but no one can tell what it really is. We can see its light; we can feel it in the hands and arms — as when you touch a Leyden-jar; we can taste it, as you know; and it will burn and give out terrible sounds. We see the lightning strike a barn, and the barn burns down, and we hear the pealing sound when the flash has darted from the black clouds. These things are only the ways in which it shows itself to us, and we say these are displays of energy. The acid in the battery bites and eats up the copper and zinc. This process releases force or energy, and this force gives light and heat and sound. Electricity is the name we give to this strange force that comes from the copper coins in your mouth; that streams from the battery; that flashes from the clouds; and burns with such beautiful fires in the Northern Lights. It is this force that is now used to light the new electric lamps in the streets.

Faraday knew that the battery would give sparks, and he discovered a way of making them stand still and burn like a lamp. After this, for a long time, nothing more was done with the light.

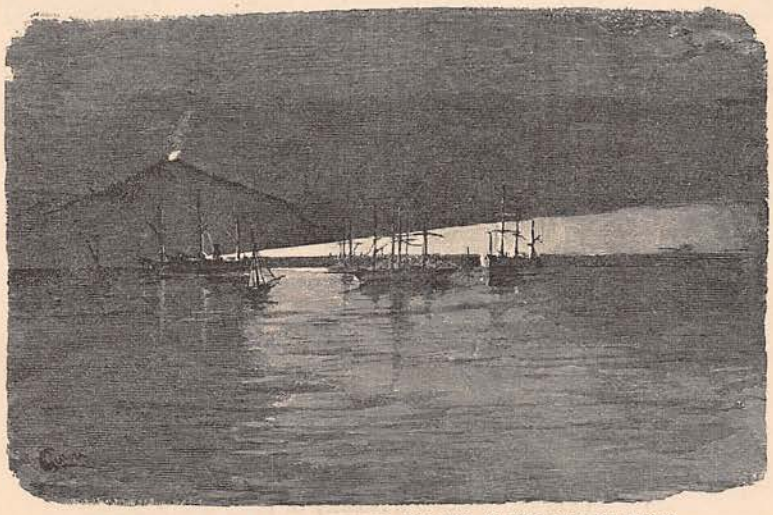
A strange thing was next discovered. If the wire from a battery were wound around a piece of iron, the iron would become a magnet. If the wire were cut in two, so that it did not reach the battery, the iron would cease to be a magnet, and become mere ordinary iron, for which needles did not seem to care. If the wire were again joined to the battery, the needles found it out quickly enough. Now, here is a curious matter. A piece of iron may be a magnet at one time, and not at another. While the electricity runs through the wire, around and around the iron, the iron is a magnet. When the electricity stops, the iron loses its magnetic power. So it appears that the kind of energy which we call electricity may create magnetism in a rod of iron. We might say, Magnetic force and Electric force are brothers. It seems so; and a magnet made by passing electricity through copper wire wound around iron, we call an electro-magnet, and the attractive power it has over a needle, we call electro-magnetism.

If Electricity is brother to Magnetism, perhaps the magnet can give us electricity? This appears to be so; for if a coil of wire is placed near a magnet, and then made to revolve rapidly, electricity is found in the wire just as if it had come from a battery. Electricity obtained in this new way was therefore called magneto-electricity. Then, working on this discovery, inventors made machines for producing electricity. These machines gave more electricity than could be obtained from a battery, and it was much cheaper to make a steam-

engine turn the new machines, than to put costly metals like zinc and copper into batteries.

These electrical machines are now very common, and it is from them we get the electric force for the new lights. They are called dynamo-electrical machines, because the science of making engines work is called dynamics, and the motion or energy of the engine is used to drive the machines. They are sometimes called "dynamos"—for short—or, as we might say, "work machines."

These "dynamos" are of various kinds, but all are much alike. There is one large magnet, or a number of small ones placed together, and near the ends are set bundles of insulated wires—that is, bundles of wires, each wire being coated with gutta-percha, which shuts in, or insulates, the electricity, and prevents its escaping from the surface of the wire. These bundles of wires are called "armatures," and they are placed on axles, as if they were wheels. The steam-engine is connected with the armature of a machine, and when the engine is at work the armature turns around many hundred times in a minute, close to the end of the magnet. The armature feels the magnetism of the great magnet, and every bit of the winding wire seems to thrill and quiver with electricity.



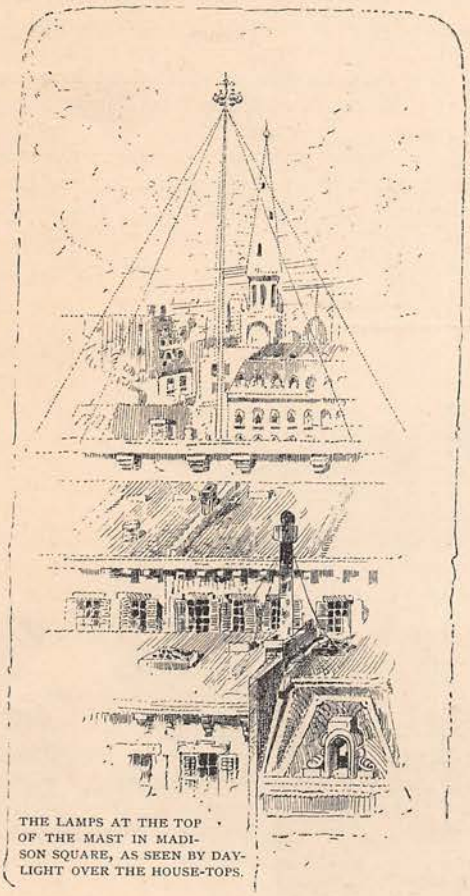
THE ELECTRIC LIGHT ON AN ITALIAN WAR-SHIP IN THE BAY OF NAPLES.

Brilliant sparks leap from the ends of the flying wire, and crackling blue flames seem to dance on the copper brushes that touch the armature, as it whirls swiftly around. On page 567 is a picture of one of these strange machines. You can not distinguish the parts of the armature as it spins around and around near the magnets. There must be something going on inside, for the whole machine is hot, as if it were in a terrible excitement over its work. Big copper wires, covered with cloth, are fastened to the machine, and are carried along the street on telegraph poles. Outside, in the dark, gleam and shine the fiery lamps, looking like baby moons glowing on the lamp-posts, or like clusters of brilliant stars burning on tall masts above the trees in the park.

If we examine one of these electric lamps in the streets, we shall find it consists of two rods, one pointing upward from the bottom of the lamp, the other hanging downward. The rods seem to touch, and the brilliant flame is exactly where they seem to meet. The man in the picture on the next page is just putting these rods into place in the lamp. Once a day he comes around with a bag of the rods. He takes out the old rods that were burned the night before, and places a new set in each lamp. After he has gone about, as if he were putting new wicks into the lamps, and each is ready for its night's work, all the lamps are lighted in broad day, to see that every one is in proper trim. They are allowed to burn until the men have walked about in the streets and looked at each lamp. If all are burning well, they are put out till it begins to grow dark. If one fails to burn properly, a man goes to that lamp to see what is the matter. The rods are made of a curious black substance, like charcoal, that is called carbon. When the lamp is out, the two rods touch each other. In order to light the lamp, they are pulled apart; and if you look at the flame through a smoked glass, you will see that the rods do not quite touch. There is a small space between their points, and this space is filled with fire. Look at the other parts of the rods, or the copper wires that extend along the streets. They have no light, no heat, no sound. The wires are cold, dark, and silent. If we were to push the two rods in the lamp close together, the light and heat would disappear, and the curious hissing sound would stop. Why is this? Let us go to the woods near some brook, and it may be that we can understand this matter.

Here is the brook, flowing quietly along, smooth, deep, and without a ripple. We walk beside the stream, and come to a place where there are high rocks, and steep, stony banks. Here the channel is very narrow, and the water is no longer smooth

and silent. It boils and foams between the rocks. There are eddies and whirlpools, and at last we

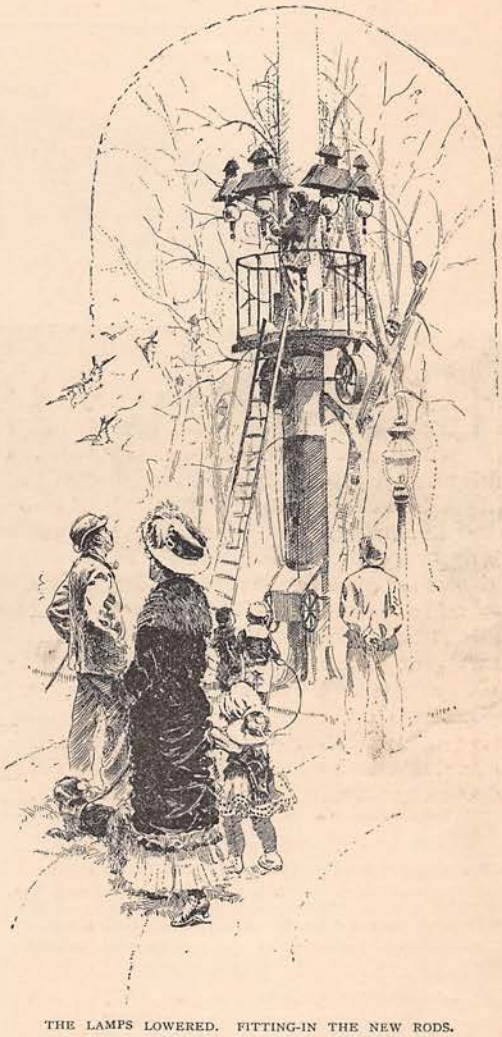


THE LAMPS AT THE TOP OF THE MAST IN MADISON SQUARE, AS SEEN BY DAYLIGHT OVER THE HOUSE-TOPS.

come to the narrowest part of all. Here, the once dark and silent water roars and foams in white, stormy rapids. There are sounds and furious leaping and rushing water and clouds of spray. What is the matter? Why is the smooth, dark water so white with rage, so impetuous, so full of sounds and turmoil? The rocks are the cause. The way is narrow and steep. The waters are hemmed in, and there is a grand display of flashing white foam and roaring water-falls, as the waters struggle together to get past the narrow place.

It is the same with the electricity flowing through the large copper wires. It passes down one wire into the other, through the lamp, in silence and darkness, so long as the rods touch and the path is clear. When the rods in the lamp are pulled apart, there is a space to be got over, an obstruction, like rocks in the bed of the brook. The electricity, like the water, struggles to get over the hindrance in its path, and it grows white-hot with anger, and flames and hisses as it leaps across the narrow space between the rods.

One of the pictures gives a good idea of the way some of the lamps are placed on tall masts, high above the trees and houses, and of the curious cone-like effect produced by the rays shining across the rain-drops at night, making each one glisten like a diamond falling out of the sky. Another view was taken from the windows of the tall building in Union Square where ST. NICHOLAS may be found at home; it shows how the masts and lamps look in the day-time. Besides these, we



THE LAMPS LOWERED. FITTING-IN THE NEW RODS.

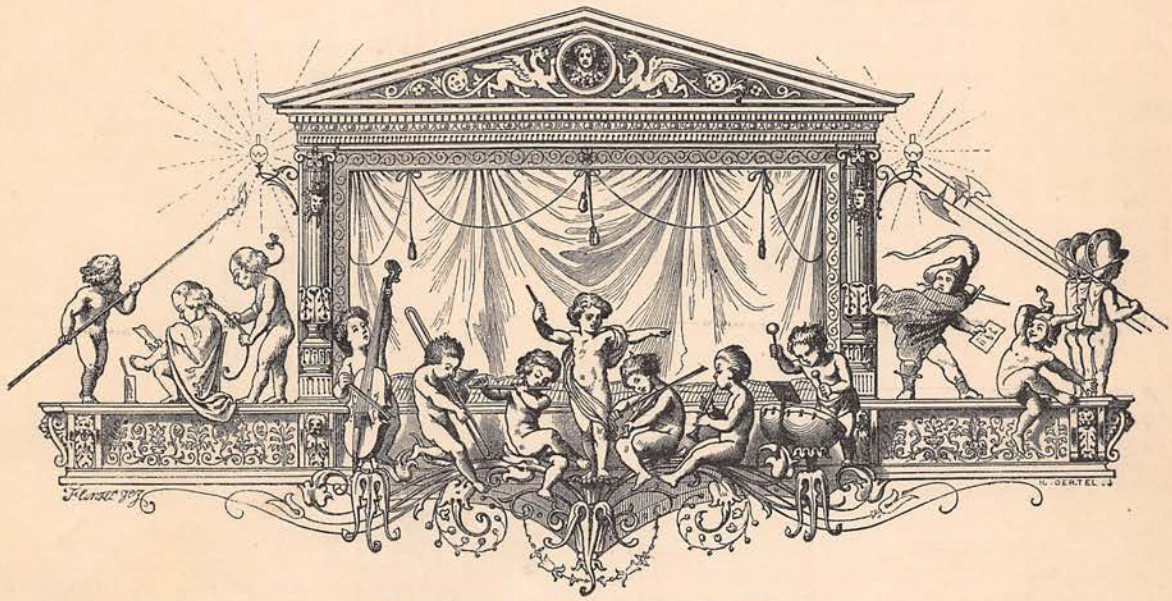
have a picture of an electric light on board an Italian war-ship in the bay of Naples. These lights are also used on steam-boats on the West-

ern rivers. The pilot moves the light about until it shines on the trees or houses upon the bank, and in this manner picks out his way along the stream.

There is another kind of electric lamp, used in houses; it has a smaller and softer light, steady, white, and very beautiful.

In these lamps, also, we have something like the narrow place in the brook. They are made with slender loops of carbon, inclosed in glass globes. The electricity, flowing silently through a dark wire, enters the lamp, and finds only a narrow thread on which it can travel to reach the home-going wire, and, in its struggle to get past, it heats the tiny thread of carbon to whiteness. Like a live coal, this slender thread gives us a mild, soft light, as long as the current flows. It seems calm and still, but it is enduring the same fury of the electricity that is shown in the larger lamps.

This is the main idea on which these lamps are made: A stream of electricity is set flowing from a dynamo-electric machine through a wire until it meets a narrow place or a break in the wire. Then it seeks to get past the obstruction, and there is a grand putting forth of energy, and in this way the electric force, although itself invisible, is made known to our eyes by a beautiful light.



# COMEDIES FOR CHILDREN.

BY E. S. BROOKS, AUTHOR OF "THE LAND OF NOD," ETC.

## II. THE NEW RED RIDING-HOOD.

CHARACTERS: JENNY, a girl of eight years. JOHNNY STOUT, a boy of sixteen or eighteen years. JIMMY BINGS, a Tramp.

The argument shows that wolves are just as designing, little girls just as heedless and helpful, and the chances of rescue just as possible to-day as at the time of the original Red Riding-hood.

SCENE: A neatly furnished parlor. JENNY discovered dusting furniture, arranging flowers, and making things look nice generally.

JENNY, *surveying her work critically:*

There! — my mamma 's gone away,
To be gone, she said, all day,
And so I am keeping house. Oh, what fun!
I shall have no time to play,
But must work and work away,
And be busy as a mouse, till I 've done.

But my mamma said to me—
Now, what was it? Let me see:
"Jenny, darling, don't go out all the day;
But keep close at home till tea,
When I 'll come and set you free;
So just mind what you 're about, dear, I pray.

"And keep Bridget right in call;
And mind this, dear, most of all:
Don't let in any stranger while I 'm gone.
Lock the windows and the hall,
And be careful not to fall,
And don't get into danger here alone."