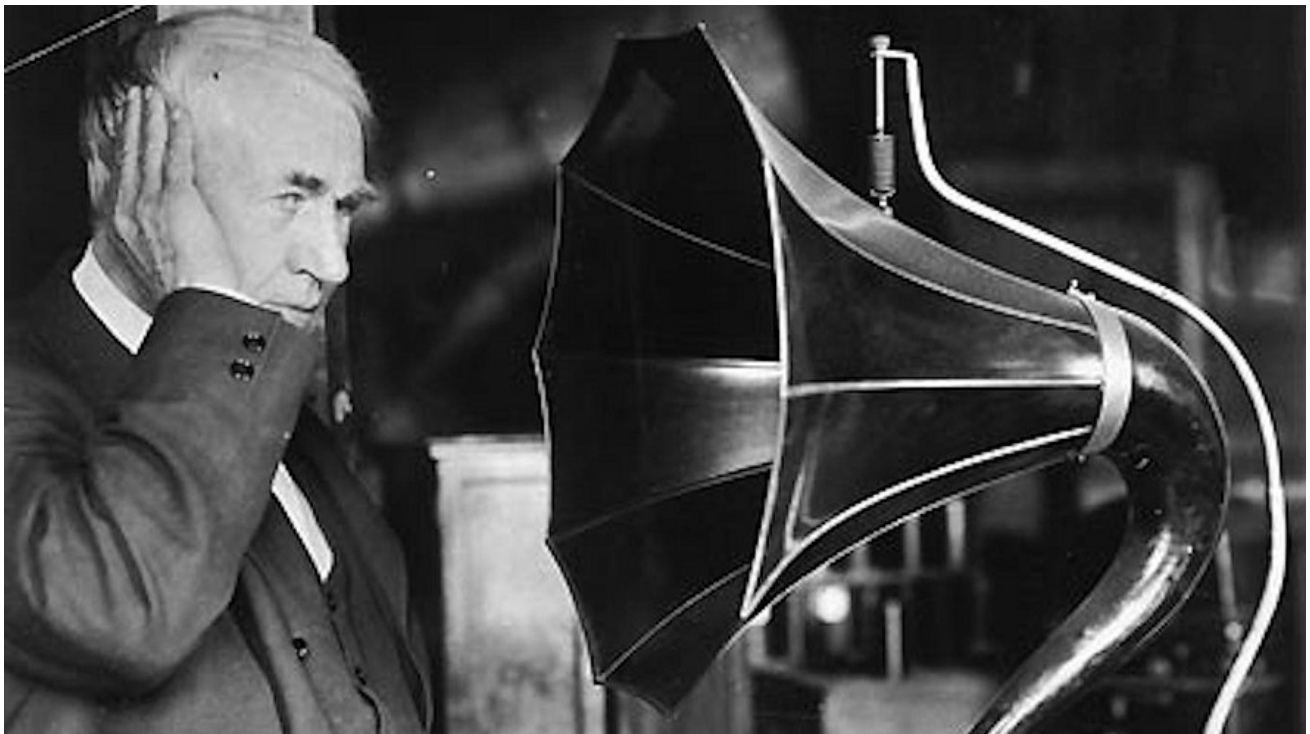


# Time Machine (1921): Thomas Edison and American invention

By C.H. Claudy, Scientific American, adapted by Newsela staff on 04.22.16

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Thomas Alva Edison, America's seventy-four-year-young inventor. Photo: Public Domain Image

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Thomas Edison just celebrated his 74th birthday, which gives us occasion to look back on his remarkable life and career. Edison is unquestionably the best known of all living inventors, and of the many brilliant scientists whose work has changed our way of life, he shines most brilliantly.

Edison would be the first to say that other men have invented things as great, as useful and as unusual. No one, however, has delved into more uncharted seas than he, or invented so great a variety of devices.

It was my good fortune to meet and talk with Edison recently. We met in the library of his laboratory in Orange, New Jersey, where Edison works (and sometimes sleeps). When I first saw him, the head of the great Edison industries was bending, smiling, over a small paper packet, and as we shook hands, he drew me over to look at it.

"Curious thing, the diamond," he said. "Two hundred times harder than any known substance and no artificial substitute in sight. It's a good thing there are enough of them, or I should have to go out of business."

He was referring, of course, to the fact that diamonds are used for a key piece of the Edison phonograph, the machine he invented to record and play sound.

## **Phonograph Is Good But Electric Power Is Better**

I plunged in with the question, "Do you think of the phonograph as your greatest contribution to the world?" Along with the phonograph, Edison is credited with inventing the electric lightbulb, motion picture cameras and projectors, and many other gadgets.

"Depends on how you mean 'greatest,'" responded Edison. "As a matter of pleasure, I suppose the phonograph has given a greater amount than anything I ever did. But industrially, of course, my work in electric light and power was of greater importance."

"How about the motion picture?" I asked.

"Oh, well, I am not actively interested in that anymore. I never am interested in a thing when it gets to the point where it is a complete success. I want to leave it then and go on to something else."

"Except in the case of the phonograph," said one of Edison's assistants, who was listening to our conversation.

"Of course, except in the case of the phonograph," Edison admitted, and explained that one reason he had continue to work on the device was that he loved music.

## **No Difference Between Live Singer And Records**

"The records are not perfect yet, but we get a little closer to perfection every time, and we never stop working on them," he said of the recordings that phonographs play. While not perfect, he noted that records had become so advanced that people could no longer hear the difference between a live singer and recording of that singer playing on a phonograph.

Edison's methods of recording, copying and playing records are carefully guarded, so I was not able to get a behind-the-scenes look at the technology. I did, however, get to see the factory where Edison phonographs, records and storage batteries are produced.

A very large part of the factory is devoted to making storage batteries. The public may not know much about these batteries, which are used on commercial trucks, for lighting railways trains, and for other purposes, but they are so popular that the factory struggles to make enough to keep up with demand.

The Edison battery, made of steel and practically indestructible, does not contain acid and never wears out. It is lighter than other batteries, and in the long run, cheaper as well.

Its greatest feature, perhaps, is its reversible chemical cycle. Batteries work through a series of chemical reactions and most batteries use chemical reactions that only go one way. They produce a chemical called lead sulfate, which cannot be reused, which means that lead batteries gradually wear out until at least one set of plates has to be replaced.

## **A Reversible Chemical Reaction**

The Edison battery, on the other hand, uses a chemical reaction that is reversible. The chemicals in the battery react to produce new chemicals, and these can then be turned back into the original chemicals. Theoretically, the battery can be reused forever.

When I asked Edison what he thought about his battery, he said that it was important, in part, because it gave humans a power source other than gasoline, which has a limited supply. Batteries can store energy from other power sources, like coal. "Coal is unlimited, practically. We have enough for hundreds of years without considering waterfalls as a power source," Edison said, adding, "With coal and water power to make electricity and an efficient means of storing that energy by a battery, we can be independent of gasoline for many purposes for which it is now used."

"The enormous increase in the use of the electric wagon, truck and pleasure car, equipped with these batteries, shows the trend of the future," he added.

During World War I, many people thought Edison would invent something so powerful that it would defeat the Germans overnight. Indeed, Edison spent two years in Washington working day and night on projects for the military, and his contributions were significant.

Edison charted the time and place that American ships were attacked by submarines, and from this research, he figured out when and where a ship was safest from attack. Like many great ideas, his method seems obvious in retrospect, and it undoubtedly saved many lives.

## **Inventing A Method For Avoiding Torpedo Attacks**

Edison also came up with a way for ships to dodge torpedo attacks. "You can hear a torpedo when it is fired and as it progresses," he said. To Edison, this meant that ships that listened carefully could pick up warnings that they were under attack before it was too late.

These warnings might allow ships to change directions and avoid incoming torpedoes, and soon American ships were provided with submarine listening devices. Edison also came up with a simple way for ships to suddenly change course. His idea was for ships to drop huge sea anchors from the front of the boat, forcing the back of the boat to swing around. Had the Titanic been equipped with these sea anchors, Edison noted, it would have been able to avoid the iceberg. He tested his anchors, and they worked, but by the time they were ready for service, it was too late for them to make a difference in the war.

Edison seems to live for his work. He doesn't need much sleep, if any, and he can go without most of the comforts that most of us rely on. At the age of 74, he is still remarkably vigorous, alive and interested in what he is doing.

I spoke to his coworkers and assistants to get a sense of what they thought of Edison. His 7,000 employees affectionately call him "the old man," I learned. He has never been too busy to be human, and never too wrapped up in inventing a new machine to forget the needs of the humans with whom he works.

At the moment, Edison is gathering data for an investigation of the ether, a substance that, if it exists at all, might explain how light travels. "I'm doing this for recreation," he told me. At 74, he is getting ready to formulate some new theory -- for fun!

## Quiz

- 1 Select the paragraph in the section "No Difference Between Live Singer and Records" that BEST implies the superiority of the Edison battery.
- 2 Which of the following sentences from the article BEST supports the claim that Edison seemed to live for his work?
- (A) When I asked Edison what he thought about his battery, he said that it was important, in part, because it gave humans a power source other than gasoline, which has a limited supply.
  - (B) Edison spent two years in Washington working day and night on projects for the military, and his contributions were significant.
  - (C) Edison charted the time and place that American ships were attacked by submarines.
  - (D) I spoke to his coworkers and assistants to get a sense of what they thought of Edison. His 7,000 employees affectionately call him "the old man," I learned.

- 3 Read the following paragraph from the article:

*I spoke to his coworkers and assistants to get a sense of what they thought of Edison. His 7,000 employees affectionately call him "the old man," I learned. He has never been too busy to be human, and never too wrapped up in inventing a new machine to forget the needs of the humans with whom he works.*

How does the paragraph above reflect a CENTRAL idea of the article?

- (A) It reveals that Edison cared mostly for inventing new machines.
- (B) It hints that Edison's employees think he is getting too old to work.
- (C) It shows that Edison cared more for the people he worked with than for his work.
- (D) It implies that Edison did not get along with most of his employees.

- 4 Which of the following sentences would be MOST important to include in an objective summary of the article?
- (A) Edison had a remarkable career making him the best known of all inventors.
  - (B) Edison is credited with inventing many gadgets, including the phonograph, electric lightbulb, and steel battery.
  - (C) Most of Edison's factory was devoted to making storage batteries used on commercial trucks and railway trains.
  - (D) Edison was very interested in what he was doing and lived for his work.