The First Movie Camera: Crash Course Film History #2

Crash Course: Film History
https://youtube.com/watch?v=pKSmcmueTbA
https://nerdfighteria.info/v/pKSmcmueTbA

Hello, I'm Craig, and this is CrashCourse film history. You probably know Thomas Alva Edison as the inventor of the lightbulb or the phonograph, but that's not entirely true - gasp.

Yes, he's an icon of American innovation and personally came up with dozens of new devices, but he was also one of those guys with too many ideas to accomplish all by himself, just like me. So he hired a batch of talented assistants and put them to work in the world's first industrial research lab in Menlo Park, New Jersey. And with their help, Edison made some major contributions to lots of technologies, including the technology of film.

Hey! That's what we're talking about!

One of those engineers was a young man named William, also known as W.K.L Dixon. Or Wickel Dixon, as I like to call him. His assignment was to create something that would animate photographs, something Edison hoped would do for eye what the phonograph does for the ear. Within a few years, Dixon invented a couple devices: the world's first motion picture camera and a peepshow-style device that let people watch movies.

I love movies. Just like that, film production was born and audiences hungry for movies weren't far behind.

[theme music]

Before Edison and his lab had even built their viewing machine, he applied for two preliminary claims with the US Patent Office - one for his plans for the device and one for its name. Thomas Edison, ever the patent-er. The idea was to create a coin-operated entertainment machine that produced images to go along with music or speech that played from a phonograph. Edison wanted to call it the Kinetoscope. I would have called it the coin-operated entertainment machine oh graph but whatever.

For William Dixon and his team working in Edison's lab, the pressure was on and there were a few technical challenges right away. First, they needed to invent the camera to capture the images that would play in the kinetoscope, duh! While Edison was on a trip to France, he ran into our old friend Étienne-Jules Marey. Remember him? That guy with the chronophotographic gun? (Awesome!) Who shot motion studies of all those animals?

Edison raced back to New Jersey and gave Dixon the scoop on the chronophotographic gun (awesome) and they decided to develop their own camera based on that design. But there was another problem. Rolls of paper film just weren't durable enough to capture a long series of images and be played back over and over again.

After some experimentation, Dixon found that celluloid film strips that were coated in light-sensitive emulsion did the trick. It's the technology that's still being used today. When in doubt, coat in light-sensitive emulsion, as the saying goes. So Edison hit up his old entrepreneur buddy George Eastman of Eastman Kodak, remember him too? And Eastman began making lots of celluloid film and 50 foot rolls, which gave Dixon all the material he needed.

The last technical hurdle was figuring out a way to stop the film very briefly and at regular intervals. Their devices needed to capture and project a series of distinct images, instead of an indecipherable blur, which is what you'd get if you ran a roll of film straight through a camera or a kinetoscope. So both the camera and the viewing device had to be able to grab and hold a frame of film long enough for it to be exposed to light and then move it along and grab the next one.

To do this, Dixon took one of those long rolls of celluloid film and cut holes along the edges - we eventually called these sprocket holes. Then he fashioned an intermittent stop-and-go device inspired by the inner workings of a pocket watch. This device was kind of like a wheel with tiny teeth that grabbed the perforated film strip by the holes and pulled it forward. The teeth stopped for a split second before grabbing the next set of holes and moving the film forward again.

This way the viewer would see a sequential series of still images that created that delicious illusion of motion as long as the stop-and-go device was moving fast enough. In 1891, at the National Federation of Women's Clubs in New York City, Edison unveiled his prototype for the kinetoscope. It was basically a cabinet with a peephole on top so you could look inside and watch pictures move - movies! I love movies.

And it was the first device that allowed for film exhibition, which is how a film is shown to an audience. But as innovative as Edison was, there were limits to his vision...unlike me. He thought of motion-pictures as an add-on to phonographs, which people listened to in their homes or in commercial phonograph parlors. He didn't foresee the power of projecting film to a huge audience of people and he was exactly right, that didn't happen, ever.

In fact, some scholars think he discouraged Dixon from pursuing film projection, which eventually fractured their relationship. But for now Edison and Dixon were chummy and worked together to create this pair of sister inventions, each with their own limitations. The kinetograph was the first motion picture camera, which worked because they figured out how to synchronize the shutter of the camera to a single frame of film, using the sprocket holes and the intermittent stop-and-go device. But it could only record images inside a studio because it was too big to haul around and needed electrical power to work. No vlogs yet, but soon...not that soon.

The kinetoscope on the other hand was a peepshow device used to view the film developed from the kinetograph. You could only show movies to one person at a time, it held 40 to 50 foot rolls, so the movies themselves could only be about 16 seconds long. It was basically the Twitter of movies. And even though Edison and Dixon originally hoped to synchronize the sound from a phonograph to the images in a Kinetoscope, they never quite figured out how to do it. In fact, true synchronous sound, or matching up sounds to images, would elude technicians for decades.

Now, some of the keys to Edison's success were his aggressive pursuit of patents and his interest in mass production, which was transforming industry at the time. Even Henry Ford's large-scale relatively cost-effective assembly lines were made possible thanks to Edison's innovations in electric power. After all, something had to keep those conveyor belts moving.

In 1894, a Canadian entrepreneur named Andrew Holland opened the first Kinetoscope parlor in New York City, charging 25 cents per person. Edison got dollar signs in his eyes and before long, Kinetoscope parlors were opening up all over the United States. People were lining up to get a brief glimpse of a moving picture as music played from a phonograph and refreshments were served. Just like film exhibitors today, Kinetoscope parlor operators made most of their money from concessions since they had to lease or buy the kinetoscopes and the films themselves.

Meanwhile, Edison was intent on collecting every single penny he was owed. Of course he wa. As more Kinetoscope parlors opened their doors, more and more people were hungry for movies. (Crash Course does not condone or recommend eating movies.) Edison put Dixon in charge of film production or everything involved in the making of film, from writing and casting actors to building sets and capturing the images. Dixon was pretty busy. And together, they built the first film production studio in the world in West Orange,

New Jersey. They didn't really have to start from scratch, the space already existed because that's where they made the first films with the kinetograph.

But they poured more time and just over $600 into it to make it a full-fledged studio. They covered the interior walls with tar paper strips to makes the performers to make the performers stand out against the stark black background. That combined with complaints that it was cramped, stuffy, and hot earned the studio its name - employees called it the Black Mariah after a local expression for police vans or paddy wagons which gives you some idea how they felt about working for a guy like Edison.

And because the kinetograph needed a lot of light to record an image they built a retractable sunroof and a set on circular railroad tracks so that it could be spun around to follow the sun's light. Did they add a hot tub as well? Be nice, have like a sun roof and a hot tub, that'd be nice. Every night William Dixon served as producer, director, and camera operator for hundreds of kinetograph films from 1893-1895. Most of them featured vaudeville performers in slapstick physical comedy, favoring movement over story. See, the Vaudeville Circuit was the mass entertainment of the 1880s to the 1930s - before radio was widespread and before movies came along.

Performers would travel together, set up shop at the local theater, and put on a variety show - everything from music comedy and acrobatics to sketches, trained animals, and excerpts from stage plays. People like Harry Houdini, the Marx Brothers, Bob Hope, and Buster Keaton all spent time on the vaudeville stage. The most famous vaudeville performers would only play the most exclusive theaters in big cities, making it impossible for the far-flung masses to see them, so they'd have nothing to do. What would they do? They'd probably sit around and punch eagles.

But with Kinetoscope parlors, one star-studded performance by say Sandow the Strongman could be reproduced dozens of times as a seconds long film. That way, audiences all over the country could get a glimpse of his bulging pecs and that sweet 'stache. Can I do a performance? Can I do a Sandow the Strongman performance?

(Nick: No.)

No? Okay, no. Using Vaudeville talent had lots of advantages for kinetograph filmmakers. Dixon had only 16 seconds to work with and couldn't record synchronous sound, so the performances had to brief and interesting to watch. Name recognition helped, as did performers whose acts were reliable and well-rehearsed, just like mine right Nick? Plus there were lots of them and a steady supply of talent helped meet the growing demand for content unleashed by the Kinetoscope.

At least, for a while. Because, as powerful and revolutionary as the kinetograph and Kinetoscope were, their limitations threatened Edison's grip on motion picture production and exhibition. I mentioned some of these earlier but they're about to become very important. So pay attention. First, the kinetograph was static, the camera couldn't move, it was too big and required electricity to run so you could only shoot movies from one perspective. Second, the kinetograph required lots of light, so it could capture images well when the sun shining in New Jersey,

Third, the Kinetoscope people viewing system meant that only one person at a time could watch a movie. Which is fine if you're like me and you don't like being around other people, but it's not for everyone. That meant a lot of waiting your turn to watch, limiting the number of customers a kinetoscope parlor could admit each day. Finally, there wasn't any editing yet, so each kinetograph movie was just one single uninterrupted shot. This wasn't necessarily a limitation - throughout the history of cinema there have been extraordinary films made from single long takes, but until filmmakers could edit different shots together the kinds of stories that could be told had to begin and end inside one brief shot.

Despite this laundry list of drawbacks, film had arrived, thanks to Thomas Edison and especially William Dion. Whatever else filmmakers were gonna do, whatever else movies were going to become, this was their start.

Today we talked about two key inventions, the kinetograph and the kinetoscope that were used to capture and exhibit the very first moving pictures. We discussed how the principles of industrial mass production helped spread their inventions, altering the landscape of mass entertainment forever. We introduced the first film studios and talked about how the first movies showcased the action of swanky vaudeville performers rather than stories. And next time, we'll learn about the first projected movies and how entire audiences of people began experiencing motion pictures together.

Crash Course Film History is produced in association with PBS Digital Studios. You can head over to their channel to check out a playlist of their latest amazing shows, like It's Okay to Be Smart, PBS Idea Channel, and Deep Look. This episode of Crash Course was filmed in the Doctor Cheryl C. Kinney Crash Course Studio with the help of these swanky vaudeville performers. And our amazing graphics team is thought cafe.

[Ending music]