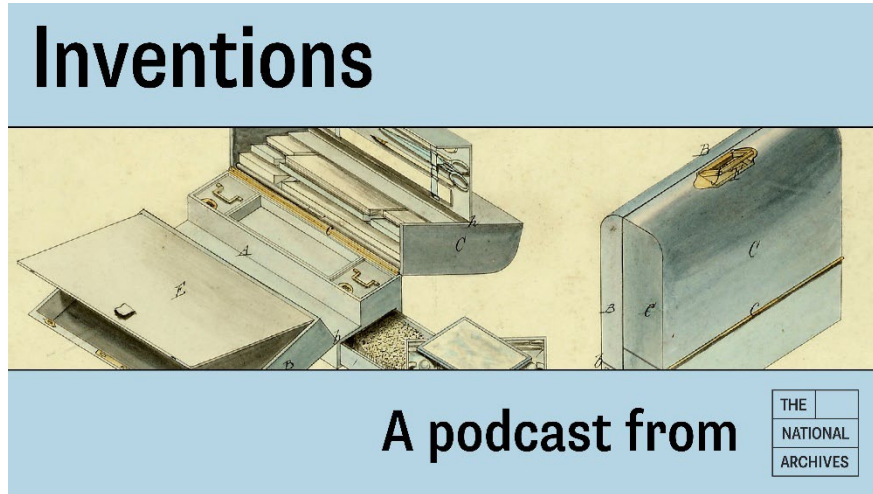


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## Inventions

A flying machine, a fish-shaped hot air balloon, and a self-ventilating hat. From million dollar ideas to an amateur tinkering in their garden shed, The National Archives is filled with the history of inventions.

In this episode of On the Record at The National Archives, Olivia Gecseg and Katherine Howells look through some fascinating patents and registered designs. They discuss inventors and their methods and explore the fascinating historical contexts behind these technical creations.

Documents from The National Archives used in this episode: [C 54/12890](#), [BT 43/191/7185](#).

For more information about the records covered in this episode, look at our research guide to [Intellectual property: registered designs 1839-1991](#). For help navigating our catalogue, you can watch our [top-level tips on using Discovery](#).

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Transcript

**Katherine Howells:** An aerial steam carriage as a flying machine, a fish shaped hot air balloon, a self-ventilating hat. These are just some of the inventions that people have patented and registered designs for over the years. From a million-dollar idea to an amateur tinkering in their garden shed, we want to get into the history of inventions.

I'm Katherine Howells, Principal Record Specialist in Visual Collections.

**Olivia Gecseg:** And I'm Olivia Gecseg, Visual Collections Records Specialist.

**Katherine:** This is On the Record at The National Archives, uncovering the past through stories of everyday people.

**Olivia:** In this episode of On the Record, the two of us are looking through some of the patents of inventions and registered designs from history, talking about inventors and how they work, and putting technical creativity in a wider context. We're doing that with some of the collections we hold here at The National Archives in Kew.

**Katherine:** Olivia, the two of us look at these records every day, but can we go back to basics? And can you tell us a little bit about what an invention is? What do we mean when we talk about an invention?

**Olivia:** An invention, by definition, is an idea, a process, or an object that someone sets into being that has never been thought of before. It's an entirely new thing, a new way of doing something, a new machine, a new gadget or a way of doing things in new ways. Examples of inventions through history might be trains or telephones or the light bulb.

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And at a point in history, these inventions did not exist in the world, so they're new and someone had to invent them. But in reality, inventions are often not entirely new things; they're developments or improvements on something that's already existed. For example, we could say that the electric light bulb at some point in history didn't exist as an object, as a device. But lighting in homes in the form of gas or oil lamps or even candles — if you go further back — has existed. And so the electric light bulb is just a development of that technological change. So it's just one step in the history of lighting in homes.

**Katherine:** Okay, great. We think about the Victorian period as a time when there were lots of inventions. But can you talk a bit about the processes by which people did invent? What were the options when it came to protecting somebody's new invention?

**Olivia:** In the Victorian period, there were two options for protecting your invention. The first was the possibility of patenting your invention. Prior to 1839, this was the only way of protecting an invention. The patent system had been around since medieval times. Patents were awarded or granted for all sorts of different things. You could have a patent for a grant of land, a title or a right to do something. And that's where the idea of patenting an invention came into being. So it was the right to produce, manufacture, or use an invention that you claimed some kind of ownership over. It was the exclusive rights to use that, and to profit from it.

In 1839 a new system was brought in so that was design registration and this was a new form of protecting design, it applied to all sorts of different types of designs but the emphasis was on the appearance of the designed object, of the manufactured object. But it also could apply to not just ornamental designs, like wallpapers and textiles and fancy candlesticks, but also to something useful that had a practical application to it. Coffee pots, dressing cases, that sort of thing. These could all be registered as designs. And this provided a way to bypass the patent system at that

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time. It was much cheaper. It was much easier to use. And it opened up the possibilities of protecting design and invention to a wider range of inventors.

**Katherine:** These two systems — the patent system, the registered design system — they were operating at the same time. Did everyone use these systems and why might they have chosen each one?

**Olivia:** The patent system was just immensely complicated. It was notoriously difficult to navigate and inventors had to pass through 15 different offices all in the City of London to obtain their patents, paying fees at every office.

Fees were on average around £120 for an invention. These could rise to up to £300 if you wanted to take out additional protection in Scotland or in Ireland. And it took a long time as well. So an inventor had to physically go to London. They had to spend time away from their business — up to two months. So this could be costly as well. It was immensely inaccessible to the average inventor.

Patents were intended for much bigger inventions, much bigger scale inventions that had a bit more importance or weight to them, a bit more significance — things like steam powered locomotives, that would have been something that someone would have patented, rather than a new design for a corkscrew or a hat.

We've got this registered design for a ventilating top hat. That lent a new development to the existing design of a top hat. It created a ventilation system in the hat, which allowed hot air to escape out of the top of the hat — hot air that would build up from the person wearing it on top of their head all day. So that was the sort of key difference between the two systems. So patents, because they were so expensive and time consuming to obtain at the time, would have been used by people who had a more serious or significant invention to protect.

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Patent law gave inventors a much more significant form of protection than registered designs. If you were to patent your invention, you were obtaining 14 years protection for the invention as opposed to registered designs. Utility designs, the designs with some sort of practical application, would only give you five years protection.

If you really wanted to watertight the protection of your invention, then you would obtain a patent rather than register it as a design.

**Katherine:** Right, OK. Can you tell us a bit about what those records look like?

**Olivia:** They're quite different in format. Patents of invention, as I said, was a system around since medieval times, and it was operated by the medieval offices of chancery. So these were offices that originated in medieval times. A lot of the processes that they were using and using to administer the system, even in the 19th century, were carried forward from that period. They were enrolling their records. The way you obtained a patent in the 19th century was: you applied to an office, you petitioned an office, and you had to wait for a period of about one or two months. And then if you were successful, a patent was issued to you. And it would have been issued to the inventor in the form of quite a grandiose document.

It was quite a decorative form of document, it had a big border on it and a seal. And it was like a certificate of your invention. It was proof that you'd obtained your patents. But the records that we have at The National Archives for the letters patent are a little bit more mundane in format. We recorded the details of what was being patented in two forms. So there was the letters patent. This was just a written record. This was a formulaic text. And these are kept on rolls. And the rolls are made of parchment. They're quite fascinating documents to handle, they're quite difficult documents to handle, it takes a long time to unroll them, to reroll them. It comes across, as soon

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as you see these documents, you see it was quite an archaic process, and then there was another part to the patent as well, there was the specification. The specification was really important for inventors to describe exactly what they were patenting, exactly what they wanted to protect, and this was really important to come back to because it showed the detail, every single detail of their invention and these came with drawings, and these were enrolled on separate rolls.

And the drawings are enrolled with them too. So these are parchment drawings. You unroll the role and unroll the drawings. And they're quite difficult to get into. But this is how they would have been administered and kept at that time. Registered designs, on the other hand, come in these quite large volumes. Again, sometimes quite difficult to handle. They're very heavy. So the heaviest of these volumes weighs 25 kilograms. They're quite enormous and each design registration was pasted in, it was given its own page. And like a patent, it came with a drawing, and it also came with a written description of what was being registered.

And the focus was on what was new or novel, because that was again the difference with registered designs. Registered designs were all about what was being improved upon, and what was being improved upon a design that already existed, rather than something that was completely new.

**Katherine:** So we hold these records at The National Archives.

**Olivia:** Yes, we've got a drawing. It's an amazing drawing, really, of the aerial steam carriage, which was an invention patented by William Samuel Henson in 1842. And this drawing is just really spectacular. It looks like something out of Wacky Races. It's very clearly an aeroplane. It looks very similar to the sorts of aeroplanes that were invented at the beginning of the 20th century, at the very beginnings of successful powered flights.

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There's big stretches of grey canvas for the wings, which are rectangular in shape. There's a big tail fin at the back. And there's a sort of dark greyish body with these quite hazardous-looking wheels almost in the shape of a wheelbarrow. And there's these pink propellers as well.

Quite flimsy-looking in some ways. But the whole thing is just spectacular. It just comes together as a really impressive depiction of an invention for flight.

The fact that it was patented in 1842 is of course incredibly surprising in the trajectory of that history of flight, because successful flight didn't happen for at least another 60 years. So it's quite astonishing to see this.

**Katherine:** Can we take it that this maybe wasn't successful in terms of its ability to fly?

**Olivia:** That's right. Yeah. William Samuel Henson was an inventor and he was incredibly interested in flight. He worked with a fellow inventor, John Stringfellow.

The two of them were actually in the lacemaking industry. They worked together on this invention, they developed it over several years and eventually patented it. But at the time they patented the invention, they hadn't actually built it. So this invention never flew. The aerial steam carriage never flew. But in principle, it was a quite sound invention for flight. The thing to mention about it that's really important is that it was steam powered. The steam power came from a coal powered engine which was incredibly heavy and it would have weighed the aircraft down. It wouldn't have been able to fly because of that huge engine attached to it.

**Katherine:** It shows us a good example of how a patent system was used in that people were speculatively patenting inventions that they hadn't even built. They hadn't even built models of, so they didn't even know that it was going to work.

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**Olivia:** Yeah, that's absolutely right.

**Katherine:** They also wanted people to know about it, right? It was promoted as an invention. How was this invention received publicly?

**Olivia:** Absolutely. Yeah. And Henson and Stringfellow did quite a lot to promote their invention themselves. They were really intent on getting it out there into the public realm. So it wasn't just about the invention itself as some sort of mad idea dreamt up by two eccentric inventors.

They were also trying to start a business. So at the same time they petitioned Parliament for a bill to incorporate a company called the Aerial Transit Company. And this was actually intended as, or it would have been, the first commercial airline, because what they wanted to do was use this steam carriage as a postal service. In the specification, in the invention specification, it actually does start by saying that this was intended to convey passengers, but also letters by air. And so they petitioned Parliament for the bill. It was unsuccessful, and Parliament reportedly laughed it out of the House of Commons and they thought this idea was absolutely absurd.

But the two inventors had a prospectus which they issued to try and get investment for their invention. So they were crowdfunding, if you will. And they were offering people shares in the company. And through the prospectus they were trying to describe what the invention could achieve. So the idea was that this would be able to be used as an airmail service and it would have some sort of a business angle to it. It was an enterprise.

**Katherine:** Obviously this was coming in a period of great innovation in the use of steam and other kinds of technologies, but also would you say that this kind of invention, and other inventions like this, were another branch of empire building in terms of the way that they wanted to use these kinds of inventions to link up places all around the world?



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**Olivia:** Yeah, that's a really interesting point. Obviously, flight at this point is at quite an early stage in terms of invention. There were some flights through hot air balloons. It was a big hot air balloon craze in the 1780s, that this follows after, but also at the same time there are huge developments taking place in steam-powered transport.

And of course, we're talking about trains and we're talking about steamships, which were obviously more successful at that point. At this point in 1842, we do have steamships in operation. These were really crucial in the East India Company's endeavours in India and right across the empire in expanding their territories.

So steam power really reduced the scale of the world, if you will. It brought things closer together. Literally, it made communication much faster. It made travel much faster. And steamships were also used in sort of military endeavours too. So in the Opium Wars they played a really important role.

I think there are no direct links that we can necessarily draw between this invention and the notion of expansion of empire, but certainly that use of steam power is evident in empire building in other regards.

**Katherine:** Yeah, definitely. So it's the wider context is what's bringing some of these inventions into the system basically. We have the patent for this particular invention, but do we have any other records relating to this invention?

**Olivia:** Yeah, we do actually. And funnily enough, this other record comes up in another series of intellectual property records we hold here at The National Archives, which we've talked a little bit about already — registered designs.

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This particular record is not a utility design or it didn't have a practical application. This was one of the ornamental registered designs and it's a design for a textile specifically a printed handkerchief. And it's a really fascinating record. It's actually a satirical print handkerchief. It shows the aerial steam carriage in flight above China, and it has these comments that pass commentary on the public's view of the steam carriage. I can read out some of the text from it.

So we can see here up in the air, we've got the steam carriage in flight and there's a man standing on the wing being given directions from the pilots of the steam carriage. And he says, "Tell you what, old governor, it's all very nice you're hollering through that ear trumpeter with your 'aye this' and 'drop that' but blow me if I come out on this machine anymore." And someone else replies to him saying, "Banish all fear, friend, for the machine goes as it should and we have the wind in our poop." It's quite interesting to see how people imagined how this machine would fly and how it would be to actually be on it. And there's another part too, with a dialogue between two passengers sitting within the carriage of the steamship.

It's funny because when you look at the invention, the patent drawings, you imagine how fearful it would have been to be up in the air in what is basically a tin can in 1842. Somebody on the handkerchief is quoted as saying "So this is true for on this side the wind blows so strong that a thousand pair of bellows seem to be fanning me. If we go on at this rate, we should soon reach region of fire." And a passenger in the cabin replies, "I think we're already at that same fireplace for I am all of a sweat, either with that same region you speak of or the steam boiler at my back."

There you're getting that sense of someone imagining what it would have been like to be sitting next to a coal powered steam boiler up in the air, however many feet, flying towards China or Egypt. China is what's depicted on this handkerchief. And there's a suggestion there that the steam carriage is taking letters to China.

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**Katherine:** It's interesting that we can find out information about inventions through other kinds of records, through a variety of other records, including a handkerchief.

It seems like in the Victorian period, there were a lot of inventions. Was this really a peak in inventing? Was the Victorian era a time of great invention or was it actually not that different from before and after?

**Olivia:** 1840 is said to be when the Industrial Revolution comes to an end. So we've got in Britain at that time, a huge amount of machinery and processes that are capable of turning out lots of different things. There are publications like Mechanics Magazine where people are having weekly discussions on the latest inventions and commenting on their success. So a lot of people were engaged in discussion around it.

I wouldn't necessarily say that our invention records are the best way of measuring how many inventions were taking place. It is sometimes quite difficult to say. Statistically, you know how many inventions? How many inventions there were at a certain point in time? It's difficult to measure that because, of course, patents are not the only proof of an invention.

There was plenty of inventive activity taking place outside of the patent system. In fact, many people, even famous inventors, refused to use the patent system. Isambard Kingdom Brunel, he was one of these famous critics of the patent system. And he said that patenting was detrimental to invention and creative progress. And he refused to use it.

**Katherine:** Patents are an interesting way of having a window into what was going on into the world of inventing in this particular period, but they're not everything. People before were inventing and people were inventing outside of that system. But could you talk a bit about how these systems influence our idea of the inventor or the Victorian inventor?

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**Olivia:** They do give us a certain sense of what an inventor is because for patents we have only a small representation of what was really being invented at the time — it tended to be, people with means and people with these large-scale ideas who ended up patenting and that's a false representation because there were plenty of people out there who didn't have the means and didn't have the backing to be able to bring their invention to the patent system. Registered designs are a little bit more comprehensive in that respect. Because it was a more democratic system being cheaper and easier to use we see a broader range of the demographic of the inventor there.

So we see these smaller scale entrepreneurs, smaller business people registering designs. There are more sort of individuals represented there or small companies rather than in the patents of invention who were seen as these like creative geniuses who were patenting their designs

**Katherine:** We're now in a digital age and some of the inventions you might say that people work on now are quite different from Victorian times. There's the rise in AI and it seems like there's so much progress going on. So do you think that we are in an era of invention today?

**Olivia:** I think, absolutely. I think by the very nature of humankind, we are an inventive species. So we're constantly inventing. There's always invention taking place. People are always tinkering with things. We're always inventing and we always will.

**Katherine:** If this episode piqued your interest, you can learn more about the history of invention and discover your inner inventor at Spirit of Invention, a free exhibition at The National Archives. Open until Sunday, the 29th of October, 2023. See our website for further details.

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