

POLYDOOR LIPPENS

(1810-1899)



PART 1: THE MAN

1.1. His life

And this is Polydoor Lippens (16 March 1810-9 May 1899), a Belgian inventor, at the age of 35. He was born in the city of Eeklo as a son of Jan Lippens, a baker.

The name Polydoor comes from Greek: 'poly' many, rich – and 'dores' gifted; and this was certainly applicable to this man. After his secondary education in Eeklo he went to Paris for further studies where he got to know prominent scholars. In 1838 he was sent by the Belgian government to London in order to study the needle telegraph designed by Charles Wheatstone. Afterwards he settled in Brussels.

In 1842 he was a mechanic at the 'Musée de l'Industrie'.

He made some scientific instruments and did research in the field of electroplating. He was also involved in making daguerreotypes (see later). He was registered as a mechanic in Galerie du Roi, 27 from 1849 until 1851. He was a very inventive figure, and filed several patent applications.

Apart from his technical activities, he was also a physics teacher at the Royal Court for several years, where he taught the two children of King Leopold I, including the later King Leopold II (1835-1909).

He started working for the Belgian Railways in the early 1850's till 1886, where he was involved in the development of the telegraph network.

It will come as no surprise that he also closely followed the invention of the telephone. He was the first to install some lines in Eeklo and developed, in the late seventies-early eighties, what he called 'the Megalophone', an amplifier for telephone systems.

In some of the (rare) literature he is also called a 'manufacturer'. Did he make all his dial-telegraphs himself? I found no proof of it, but he certainly had a workshop connected to his home when he was living and working in Brussels.

His dial telegraphs were extensively used here by the Belgian Railways, and were also exported for a couple of years.

What follows is a copy of a document that I found in a bundle from the Belgian Railways (thanks to the Archive Department of the company). This shows that Lippens was already active in 1851 for the railway telegraph service.

Entretien des appareils

N^o 623

Circulaire.
(10 Janvier 1852)

5

Par arrêté du 31 Décembre 1851, M^{te} le Ministre des Travaux Publics a approuvé une convention passée entre l'Administration et le S^r Lippens, Mécanicien, pour l'entretien des appareils télégraphiques, pendant un terme de trois ans.

Cette convention est mise à exécution à dater du 1^{er} Janvier.

M^{ss} les Chefs de station sont invités à faciliter l'accomplissement de la mission dont le S^r Lippens est chargé par tous les moyens compatibles avec les Réglemens.

Les télégraphistes, les agents, des stations qui manœuvrent les appareils télégraphiques et les agents chargés de l'entretien des piles, des fils conducteurs etc, doivent se conformer à ses instructions, quant à la manœuvre et à l'entretien journalier des appareils.

Nul ne peut toucher à l'intérieur d'un appareil télégraphique ou d'une sonnerie, qu'en la présence de l'Ingénieur, de l'Instructeur ou du mécanicien, attachés au service télégraphique, en vertu de l'art. 2 de l'instruction ministérielle du 10 Mars 1851 (R. A. N^o 11).

Lorsqu'un autre agent est chargé exceptionnellement de modifier ou d'enlever un appareil, il doit présenter au Chef de station un ordre écrit ou une dépêche télégraphique de l'Ingénieur, ou de l'un des deux agents spéciaux chargés de le secourir.

Bruxelles, le 10 Janvier 1852.

L'Inspecteur

Joseph de Direct^r de l'Exploitatⁿ,
Ad: Eyckholz.

Not only was Polydoor Lippens fascinated with communication, he also experimented in the 1840's with capturing images as he was the proud owner of Eeklo's first 'Daguerreo' (J.L.M. Daguerre) camera (the daguerreotype process, or daguerreotype, was the first publicly available photographic process, widely used during the 1840's and 1850's). Lippens also had a projection device ('magic lantern') to show slides to family and friends. It is still kept by the Eeklo Tourist Office. In the same collection there are three more portraits in daguerreotype of his parents and himself. Soon familiar with the developments in photography, he took photos of his surroundings in Brussels and Eeklo, both indoors and outdoors.



← Daguerreo self-portrait from 1850

He retired, exhausted, in 1866. But when the telephone appeared on the horizon he got a boost of energy and interest and devoted some of his time to this new wonder. In his own words "I became, for my pleasure, again an inventor and manufacturer".

He remained single all his life.

He died on 9 May 1899.

The legacy of Polydoor, his archive and some of the original devices that he made in order to put his theoretical ideas into practice are kept by the Eeklo Tourist Office. It includes his correspondence and photos, the first telegram in Eeklo, newspaper clippings, the magic lantern projector, etc. I have recently donated to them the indicator apparatus that you will see in PART 2. His scientific legacy, the apparatus (including several telegraphs), his electric train (the toy), his first bell with vibrating system are, amongst others, kept by the Royal Museums of Art and History in Brussels.

1.2. Patents

Lippens acquired a total of thirteen patents (nine 'inventor patents' and three 'improvements patents'. His first patents related mainly to telegraphy, later mainly to telephony.

One of the other patents, in 1850, was for the 'classic' vibrating electric bell. This was contested and challenged by a number of other inventors, but it was finally confirmed in Paris in 1858 and definitively awarded to our Polydoor.

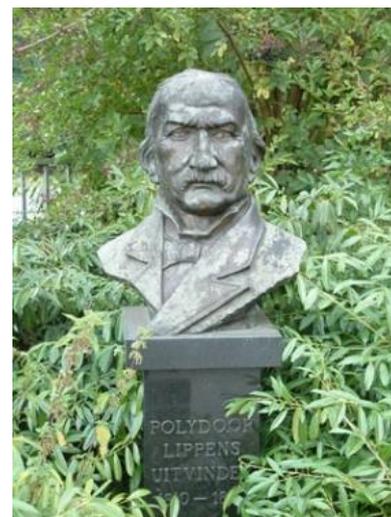
I've only found the mention of a single patent in France with file number 57328 of 5 February 1863. This was filed together with the French telegraph design and manufacturing company 'Digney Frères & Co' (see chapter 9). The title was 'Various improvements made to the equipment used in electrical telegraphy'. Later on, four additions were submitted in 1863 and 1864.

In the world of telegraphy, it was first and foremost about dial-telegraphy.

At the age of 72 Lippens received a patent for 'Des modifications apportées à l'appareil Morse' ('Improvements made to Morse apparatus').

1.2. Some honours

- In 1841 he was rewarded by the jury of the National Exhibition in Brussels as inventor and manufacturer of a small motor engine.
- At the 1847 'Industry Exhibition' he was honoured for his 'Instruments for the use of science'.
- In 1862 he received an honourable mention at the International Exhibition in London for his 'Instruments for physics and results of their use'.
- In 1868 Polydoor Lippens was appointed Knight of the Order of Leopold.
- In 1884 he was a founding member of the 'Société Belge d'Electriciens'.
- A lane in Eeklo was named after him: 'Polydoor Lippenslaan'.
- The city of Eeklo honoured Polydoor Lippens, 100 years after his death, with a bust, made by Albert D'Havé (1912-1995), in the park next to the station. Under his name is simply written, short and clear, in marble letters: 'Inventor'. The present statue is a cast of the original bronze statue which was destroyed by vandals. (Later on three Bulgarians were convicted for the destruction of the bust; they were sentenced to one year in prison.)



The label of his workshop.

Markings:

A LA FORCE ÉLECTRO-MAGNÉTIQUE. Rue Linnée 3, hors la porte de Cologne [*TO THE ELECTROMAGNETIC POWER*]; then followed by his address, which is situated in *Sint-Joost-ten-Node*]

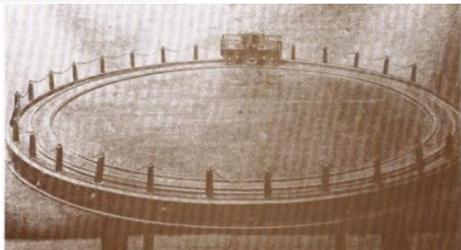
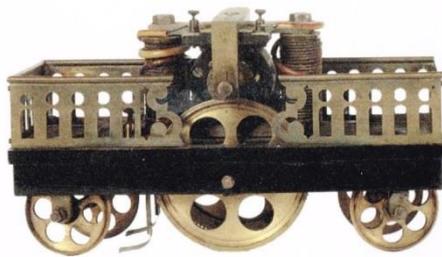
P. LIPPENS – MÉCANICIEN - FABRICANT D'INSTRUMENTS à l'usage des Sciences
 - Fait des Portraits au Daguerreotype – Bruxelles [*P.LIPPENS – ENGINEER - MANUFACTURER OF INSTRUMENTS for use in Science – Made Daguerrotype Portraits*']

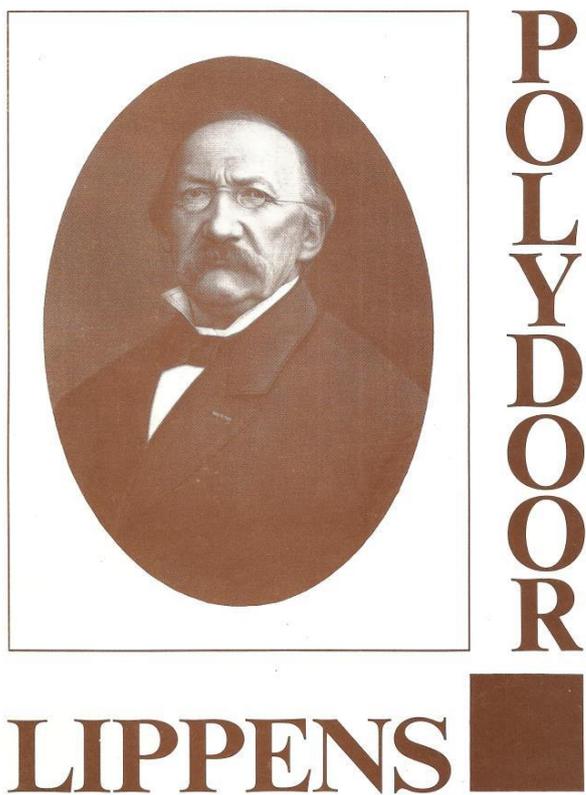
1.3. His 'famous' train

In Eeklo, Polydoor Lippens is hardly known as an inventor in the field of telegraphy, but as the inventor of the electric bell (see further down below) and the electric train!...

Well, have a look at these pictures of Lippens' train, as it was exhibited at the National Exhibition in Brussels in 1841. Well yes, it's only a small toy locomotive on a circular track! But okay, someone must have been the inventor of it too.







home.

Front cover of the brochure of 2015 [1]



Part of his legacy: photo made in his



PART 2: HIS APPARATUS

2.1. General

Typical (and inspired by Michel Gloesener, see 6), was the use of a second electromagnet to take over the function of the rebound spring as was used in the then existing electromagnets. According to these gentlemen, this required less maintenance and adjustment. After all, the spring force must be related to the strength of the electromagnet. This strength depends on the line current, which in turn depends on the state of the battery, the length of the line, the losses on the line...

- As a result, the Lippens telegraphs were virtually maintenance-free.

And by also making the anchor of the electromagnets out of magnetized steel, they obtained a polarized relay which is known to be very sensitive.

- As a result, they could work faster than the competitive telegraphs.
- And cover longer distances.

Lippens also designed a telegraph that did not print dots and dashes but the characters. The only one that I have seen was in the RTT museum. I don't know if this device was ever mass-produced, maybe it wasn't.

As I assume that very few Lippens telegraph are in private hands I will not go into the operational details here. I refer those who are really interested in it to [5] in the bibliography at the end of this chapter.

In Belgium, his instruments were used by the railways where his last one was taken out of service in 1873. Abroad he was only successful during a couple of years.

Lippens also designed simple galvanometers, combined galvanometers with a bell, lightning detectors, polarised relays,... (see below).

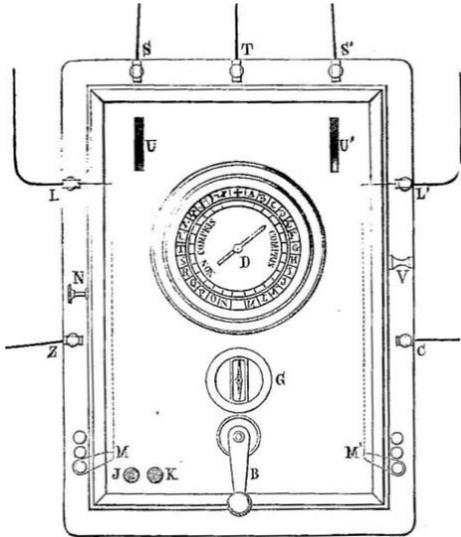
2.2. His two popular ABC (dial) telegraphs

Both models below are from the early 1850's.

2.2.1. In the model below, the voltage source is a 'magneto' that sends an alternating current to the line. The magneto produces 8 sine waves (8 + and 8 - half waves) for each rotation of the crank handle. Each of the 16 half-waves (alternations) causes the receiver hand to jump on one character. That's why the local receiver had to be connected in series with that of the remote station. One had to turn the crank handle until the pointer on one's own receiver landed on the desired character, wait a short time for the recipient to write down this character, and then turn it further in order to send the next character.

I have seen a similar model in the Porthcurno Museum in England.





2.2.2. And in this model he used a battery to send a bipolar current on the line. Between each + and - impulse there is a zero-current moment which improves the reliability (no danger that the receiver would still jump to the next character when stationary). The speed was 8 to 10 words per minute (a standard word = 5 letters plus a space).



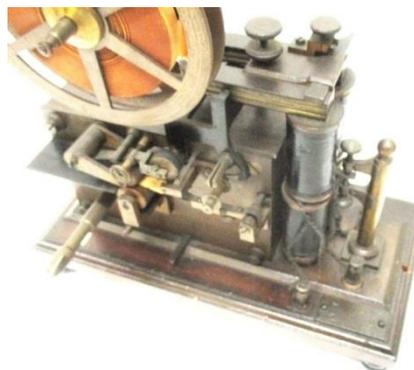
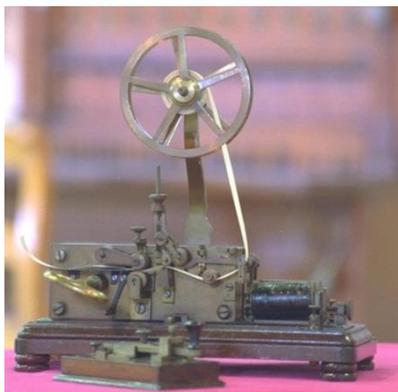
Here is another example of this second model.



2.3. Other telegraphs (ex-RTT collection)

I am not sure whether they were designed and made by Lippens or Gloesener (or...)?

3.1. Morse



The one on the right has the typical double electromagnet from Gloesener. Here they are mounted vertically and on top of them sits a horseshoe style permanent magnet...

2.3.2. Character printing

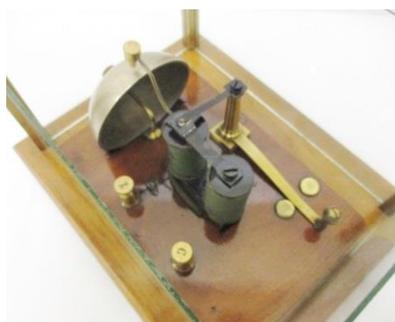


2.4. His 'vibrating' electric bell

As stated in Part 1, his patent of 1850 was contested and challenged by a number of other inventors, but it was finally confirmed in Paris in 1858 and definitively awarded to our Polydoor. One must say that it was based upon the trembler/interrupter by Neef (used in induction coils). And on 5 February 1863 he filed, together with the French telegraph design and manufacturing company 'Digney Frères & Co', another (improvement) patent with file number 57328. This cooperation is proved by the label on my bell as it says:

' LIPP^s DIGNEY Fr^{es} & C^{ie} ' (see below).

2.4.1. Here below you see five examples of his earliest models (ex RTT collection)



2.4.2. Special ones

The one here on the left with the double electromagnet is not signed and may be as well one designed and made by Goesener (see the previous chapter). The one on the right combines a bell and a simple galvanometer (current indicator).



2.4.3. The 1863 'Digney' model (my collection)



2.5. His lightning protector



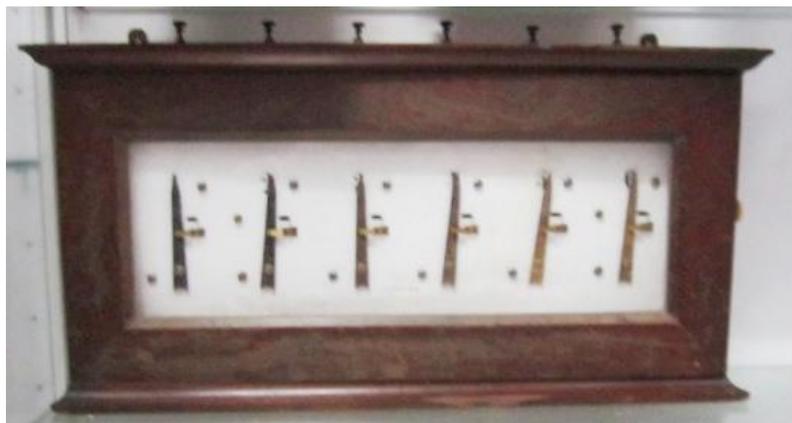
2.6. His matrix switch



2.7. His 'indicator'

And here is the 'line indicator' that I have donated to the Cultural & Historical Association (V.V.V.) of Eeklo.

This box has six input ports and one output. It allows the operator to pick up one incoming line (out of up to six) and switches it through to the central site receiving apparatus. When a remote station calls in, its corresponding needle indicator moves to the right and stays there. At the end of the communication the operator pushes the reset knob; the needle goes back to the vertical position and a further incoming call may be accepted.



model shown here in its collection

2.8. His 'improved' telephone

As mentioned above in 1.1. when he was already retired, he tried to improve the basic telephone. The former RTT museum had the



BIBLIOGRAPHY

1. General

- [1] POLYDOOR LIPPENS 1810-1889 - V.V.V. EEKLO - 1998 - 60 p.
- [2] NOTICE NECROLOGIQUE SUR Mr. P. LIPPENS - J. BANNEUX - Décembre 1890 - 3p.
- [3] DE NALATENSCHAP VAN POLYDOOR LIPPENS - PROVINCIE OOST VLAANDEREN - 2015 - 20 p
- [4] GALERIJ VAN EEKLOSE GROTEN - POLYDOOR LIPPENS - P. BEIRNAERT - 1960 - 18 p.

2. Technical (telegraphy)

The following books each give only a brief description of (the) Lippens telegraph(s).

- [5] EXPOSE DES APPLICATIONS DE L'ÉLECTRICITÉ – Conte Th. DU MONCEL - Tome 3: TÉLÉGRAPHIE ÉLECTRIQUE - 1885 - 547 p. + Planches
- [6] THE ELECTRIC TELEGRAPH POPULARISED - Dr. D. LARDNER - 1855 - 260 p.
- [7] RECHERCHES SUR LA TÉLÉGRAPHIE ÉLECTRIQUE - M. GLOESNER - 1853 - 124p. + Planches
- [8] NOUVEAU TRAITÉ DE TÉLÉGRAPHIE ÉLECTRIQUE Tome second - E. BLAVIER - 1867 - 479 p.
- [9] HOE WERKT DE TELEGRAAF – A. BOGAERD
- [10] ANNALES DES TRAVAUX PUBLICS DE BELGIQUE-Tome XI - 1852 - gives a description of his first telegraph

WEBOGRAPHY

(a) https://nl.wikipedia.org/wiki/Polydoor_Lippens

(b) <https://www.archiefbank.be/node/489>

(c) <https://books.google.be/books?id=MR8OAAAQAAJ&pg=PA3&dq=Telegraphie+des+chemins+de+fer,+des+mines+lippens&hl=nl&sa=X&ved=0ahUKEwiRlfvp2r3mAhXeQ0EAHTtfD30Q6AEIKzAA#v=onepage&q=Telegraphie%20des%20chemins%20de%20fer%2C%20des%20mines%20lippens&f=false>

This is the book 'TÉLÉGRAPHIE DES CHEMINS DE FER, DES MINES ET DES ÉTABLISSEMENTS INDUSTRIEL – APPAREILS, SONNERIES ET ACCESSOIRES DE P. LIPPENS' - A. Labbroux et compagnie, imprimeur, - 1856

THANK YOU !

Mr. **Nigel HOULT**, a retired electronic engineer with an interest in vintage radio, for the correction of my Flemish English.

Mr. **Johan VAN HYFTE**, president of the VVV-Eeklo (Association for the Promotion of Tourism)
