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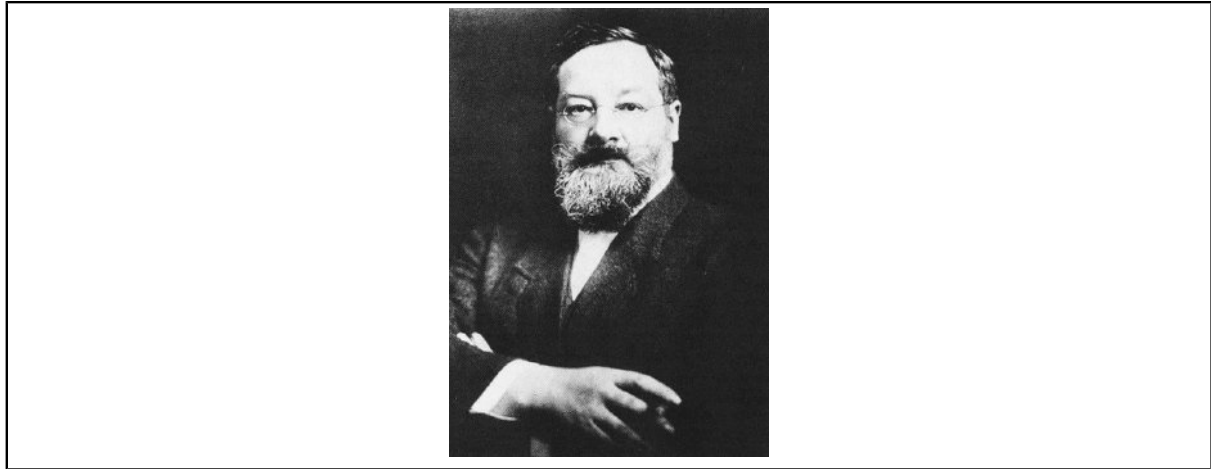
# Titchener's Photo Album: An Important Source on Early Psychological Instrument Makers

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Cover of Titchener's photo album on psychological instruments

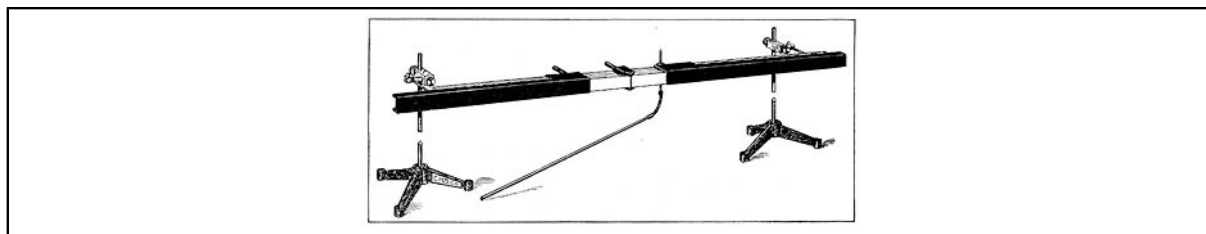
Edward Bradford Titchener (1867-1927) was a major figure in the early days of American experimental psychology. He was born in England and received his undergraduate education at Brasenose College, Oxford. He also spent a year at Oxford in the experimental physiology laboratory of John Scott Burdon-Sanderson.



Edward Bradford Titchener (1867-1927)

For his doctorate, Titchener went to Leipzig to study with Wilhelm Wundt . After receiving his doctorate in 1892 Titchener accepted a position at Cornell University in the United States. He remained there as chair of the Department of Psychology and director of the psychological laboratory for the remainder of his life.

Titchener was called in his lifetime the "Dean of American Psychologists," and after his death "A cardinal point in American systematic psychology." He was the unquestioned leader of the experimental psychology of consciousness, using the introspective method. Perhaps his greatest contribution to psychology, however, was in his emphasis on psychology as an experimental, laboratory science, one of the three fundamental sciences, along with physics and biology. To Titchener, laboratory experimentation meant a careful use of method and instruments. Titchener told his students that "Results are a function of method." By method he meant both procedure and instrumentation. He designed several instruments himself and adapted many others that became standard in psychological laboratories well into the 1940s.



Titchener's model of the Galton Bar for determining errors in spatial judgments

Titchener also believed that instruments were essential for classroom demonstrations. His own lecture room was always set up with devices to demonstrate the topics of the lectures. The photo below shows Titchener's lecture hall in Goldwin Smith Hall at Cornell, set up for a demonstration of color mixing and contrast phenomena.



E. B. Titchener's demonstrational classroom,  
Goldwin Smith Hall, Cornell University, ca. 1905

Left is an air compressor for acoustic devices. Middle shows an apparatus for visual contrast. Right on the table are color mixture apparatuses.

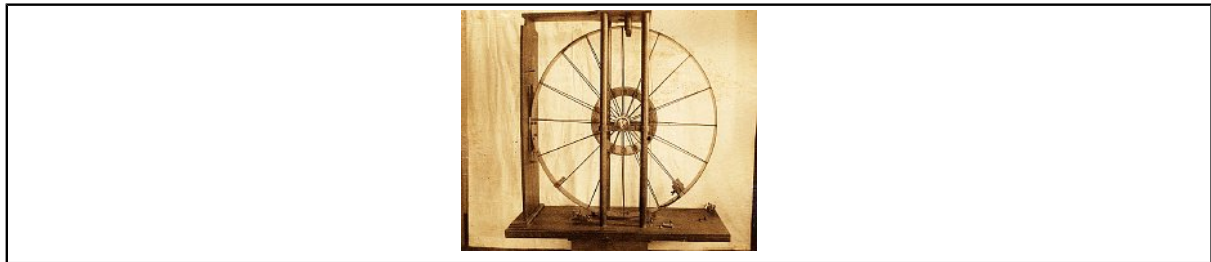
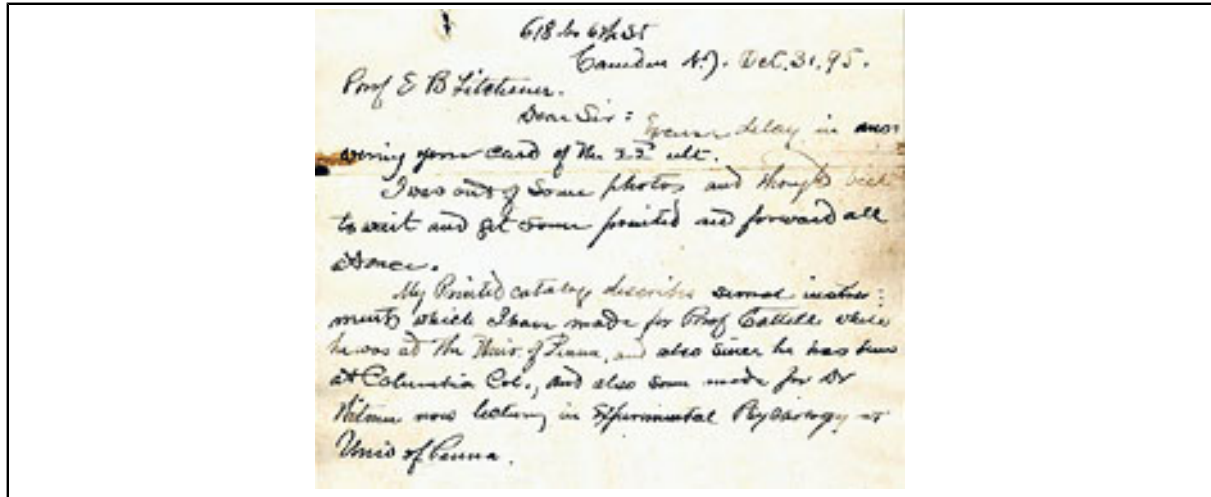
It was while he was in Leipzig that Titchener began to collect trade catalogues relevant to the new, experimental psychology. He bound these catalogues into over 40 volumes by the time of his death in 1927. Titchener's library was sold to Rice University in Texas soon after his death. Unfortunately, during a de-accession sweep of the Rice University Library in the 1970s, the catalogue collection was discarded. Only three volumes survived, having been discovered in a trash bin by a member of the psychology faculty, Trenton Wann. It was through Professor Wann's kindness that the author of this note came into possession of the three surviving volumes. Most of these catalogues have been scanned for my catalog collection in the Virtual Laboratory and are available for viewing online.



Cover of Titchener's photo album on psychological instruments

One of the three surviving bound volumes was an album of photographs along with some hand written catalogue items. Titchener put this album together sometime between 1894 and 1899. It is made up of photographs sent to him by early makers of psychological instruments. Even in the 1890s, most established instrument makers had printed catalogues with descriptions, prices and often with line engravings. There were exceptions, however, and this album demonstrates some of the reasons for those exceptions.

Many early makers of psychological instruments were employed by psychology departments or institutes to make instruments for the laboratory. When these attracted attention outside the institute the maker would often be approached to make copies of the instruments for sale. This sometimes created a cottage industry that the instrument maker (often poorly paid by universities) provided with a source of extra income.



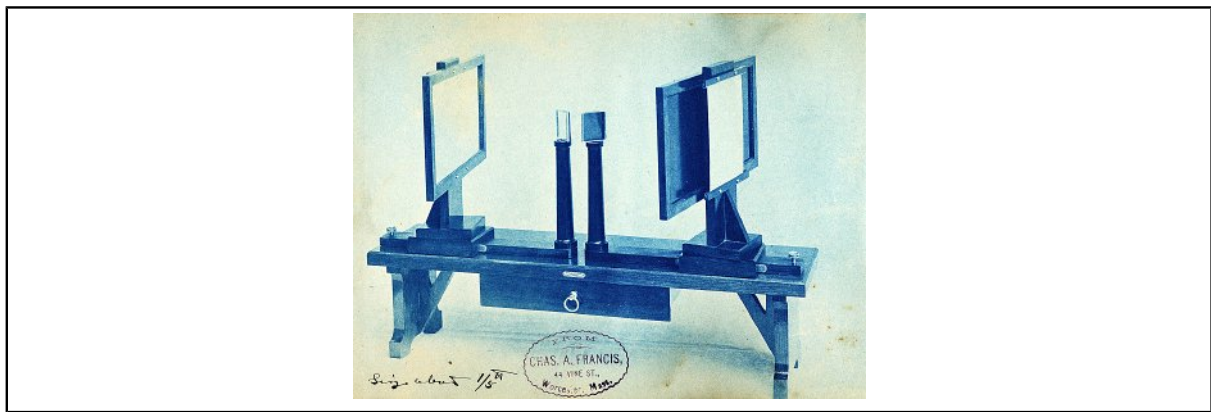
A letter from J.D. Brown of Camden, New Jersey to E. B. Titchener, October 31, 1895 (detail, left) and a photograph of a One Meter Wheel Tachistoscope made for J. McK. Cattell and from his design.

Sometimes their "catalogues" were letters, handwritten or reproduced by early duplication techniques. These and other instrument makers just getting established could not afford the cost of engravings and merely printed price lists with descriptions but without illustrations. If the prospective customer were interested, photographs would be supplied, sometimes with more detailed descriptions and sometimes with diagrams.

Titchener's album contains photographs and hand written descriptions from the earliest days of instruments made especially for psychological research. Such instruments were often borrowed from experimental physiology, but increasingly, they came from psychological research itself. The album gives very rare photographs rather than line engravings, some of which are unique representations of instruments no longer in existence. The remainder of this Essay presents the instrument makers whose photographs and descriptions were included in this album:

**C. A. Francis, Worcester Massachusetts, USA**

Francis supplied instruments to the psychological laboratory at Clark University and was quite likely Edmund C. Sanford's departmental mechanician. G. Stanley Hall, though president of the University, was also involved in the laboratory. I know of no catalogue or price list from this maker.



Francis's blueprint photography of his model of Wheatstone's mirror stereoscope made for the psychological laboratory at Clark University, Worcester, Massachusetts, USA.

Photographs of the following instruments by Francis were included in Titchener's album:

Endless paper kymographion, for 10-inch paper, compound model

Endless paper kymographion, for 10-inch paper, compound model

Pendulum chronoscope, Fitz model (top) and Endless paper kymographion, 8 inch roll (bottom)

Stereoscope (see also above)

Temperature stimulators

Weighted, adjustable tuning fork on resonator base

Tuning fork on resonator base

Multiple sound pendulum (Sanford) (front view)

Multiple sound pendulum (Sanford) (back view)

**Elmer Willyoung, Philadelphia, Pennsylvania, USA**

Willyoung had been an employee of James W. Queen, an instrument maker and importer located in Philadelphia. Willyoung set up a company of his own in the early 1890s. He was well known for his electrical measuring devices. He began making instruments for

psychology and physiology in 1895. His first catalogue is the Price List of Psychological and Physiological Instruments and Apparatus. Another of his early catalogues, the Illustrated Price List of Psychological Apparatus, was based on the designs of Yale psychologist E. W. Scripture and supplied instruments described in Scripture's *Thinking, Feeling and Doing* (1895).

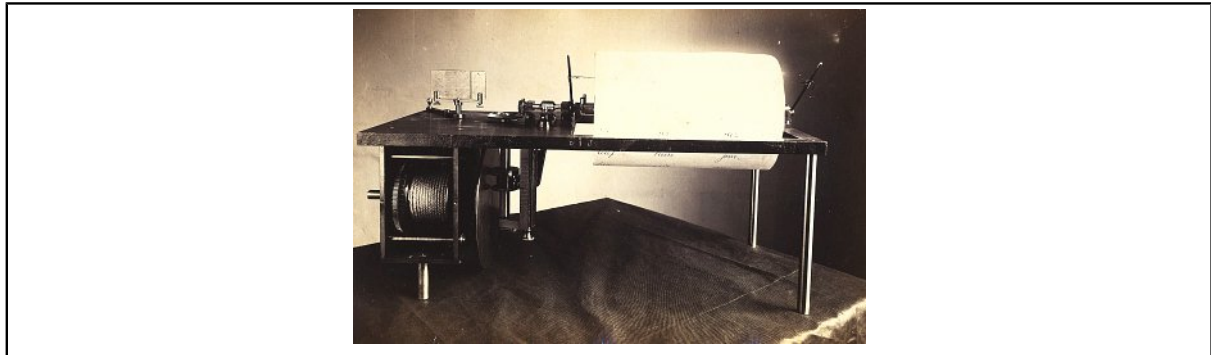


Titchener's spinning table for experiments on dizziness

Beginning in 1896, Willyoung distributed his catalogues through James G. Biddle in Philadelphia (see Biddle's *Abridged Catalogue of Electrical Measuring Instruments and other Scientific Apparatus* and his *Supplementary Catalogue of Psychological and Physiological Apparatus*). According to Biddle's catalogue *New Apparatus at Special Prices*, Willyoung's firm was sold to Morris E. Leeds in 1899. Leeds, "wishing to start fresh," sold off the remaining stock through Biddle. Willyoung's catalogues contained simple outline drawings as well as sophisticated line engravings. The image sent to Titchener was a photograph, however, a shot of the spinning table designed by Titchener for the study of dizziness and disorientation (see also above).

### **Carl Diederichs, Göttingen, Germany**

Diederichs was an established maker of instruments who supplied psychological instruments to the laboratory of Georg Elias Mueller at the University of Goettingen. Diederichs and his partner Bertels had been employees of the firm Meyerstein and bought the company in 1875. In time the firm became known as Carl Diederichs. Diederichs may have had a printed catalogue in 1895 but reported in a letter to Titchener that he had none left to send out. Instead he sent a hand written copy of the price list along with photographs and hand written extended descriptions of some of his instruments. In 1898 Diederichs was bought out by two employees, August Spindler and Adolf Hoyer, later changing the company name to Spindler and Hoyer (for two catalogs of that firm, see their 1908 price list *Apparate für psychologische Untersuchungen* and their 1921 catalogue *Apparate für psychologische Untersuchungen*)



G. E. Müller and F. Schumann's Memory Drum. Diederich's photograph is of the first commercially available memory drum

Photographs of the following instruments were included in Titchener's album:

Chronograph according to Schumann (extended description, see also price list, Nr. 5);

Schumann's tuning fork time marker of the chronograph (description, price list, Nr. 8);

Simple reaction key for the electric stimulation of fingers (left) and fivefold key for dialing attempts (right) (description, price list, Nr. 14 (left) and Nr. 15 (right));

Keys for Schumann's time sense apparatus (left) and rotation device for Schumann's time sense apparatus (right) (description, price list, Nr. 3 (left) and Nr. 2 (right));

Helmholtz's light interruptor (description, price list, Nr. 10);

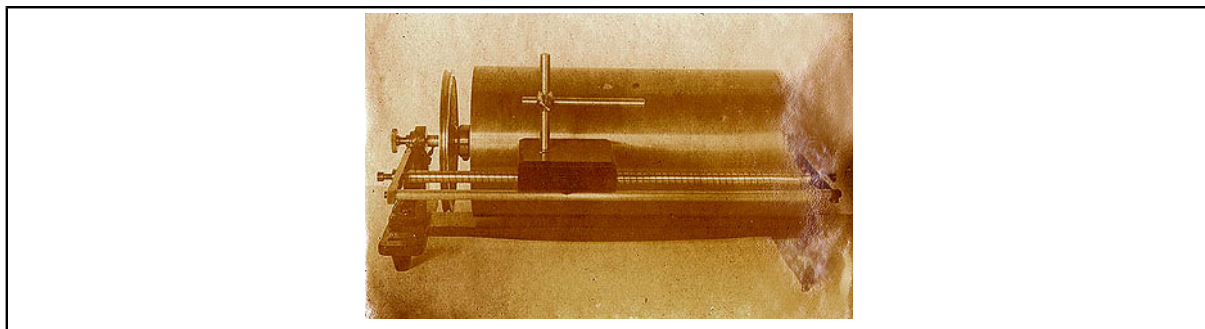
Müller's and Schumann's rotary apparatus for experiments in memory (see also above) (description, price list, Nr. 1);

Schumann's new time sense apparatus (description, price list, Nr. 4);

Helmholtz's electric rotary apparatus (description, price list, Nr. 9).

### **Michigan Apparatus Company. Ann Arbor, Michigan, USA**

Very little is known about this company which was established to make instruments for Walter Bowers Pillsbury's psychological laboratory and Warren Lombard's physiology laboratory at the University of Michigan. The company existed before 1899 but was out of business by 1905. One supplement to their catalogue is known to exist but no full catalogue.



### Kymograph Drum mechanism

On one page in Titchener's album, the following instruments by that company are shown: a worm gear rotation converter (top right), an electro-magnetic recording stylus for kymographs (top left), a kymograph drum mechanism (bottom left, see also above), and two views of an electro-magnetic recording stylus for kymograph (bottom right).

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**J. D. Brown**, Camden, New Jersey, USA

J. D. Brown was employed by the firm of Clay and Torbensen in Camden, New Jersey in the early 1890s. He made instruments for J. McKeen Cattell and George S. Fullerton at the University of Pennsylvania as early as 1892 as a worker for Clay and Torbensen. He appears to have set up a company of his own devoted to the instruments designed and used by J. McKeen Cattell. He also made instruments for Lightner Witmer at the University of Pennsylvania. Brown sent his price list and photographs to Titchener in October, 1895.



Brown's Sound Treated Hipp Chronoscope. The wooden covering of the clockwork replaced the fragile glass dome and reduced the noise of the Hipp chronoscope

A separate catalogue by Brown gives additional information on the instruments depicted. Links to the catalogue description number and page is given below for each item. Brown's catalogue contains some hand written updates. It was given the author by Karl M. Dallenbach, one of Titchener's doctoral students and a designer of instruments. This is certainly the catalogue Brown sent to Titchener since some of the photos are described in hand written entries in the updated catalogue.

Second's pendulum (right) and Temperature cylinders (left) (See catalogue, Nr. 15 (second's pendulum) and Nr. 26 (temperature cylinders))

Witmer's knee-jerk apparatus (top) and Witmer's color mixer (bottom) (Nr. 27 (knee jerk apparatus) and Nr. 21 (color mixer))

Cattell's pendulum chronometer (top) and Cattell's visual distance perception apparatus (bottom) (Nr. 22 (chronometer) and Nr. 9 (distance perception apparatus))

Cattell's meter wheel tachistoscope (top), Temperature Stimulators (bottom left), and Cattell's Algometer or Pain stimulator (bottom right) (Nr. 2 (tachistoscope), Nr. 11 (temperature stimulators), and Nr. 10 (algometer))

Time and extent of motion apparatus (top) and Spatial justments ruler (bottom) (Nr. 3 (time and motion apparatus) and Nr. 8 (ruler))

Contact switches (top left and right) and Spatial judgment apparatus (bottom) (Nr. 23 and 24 (contact switches) and Nr. 4 (spatial judgment apparatus))

Pen carriage for Witmer's Chronograph (top) and Witmer's Chronograph (bottom) showing pen carriage, driver mechanism and weight (Nr. 25 (pen carriage) and Nr. 20 (chronograph))

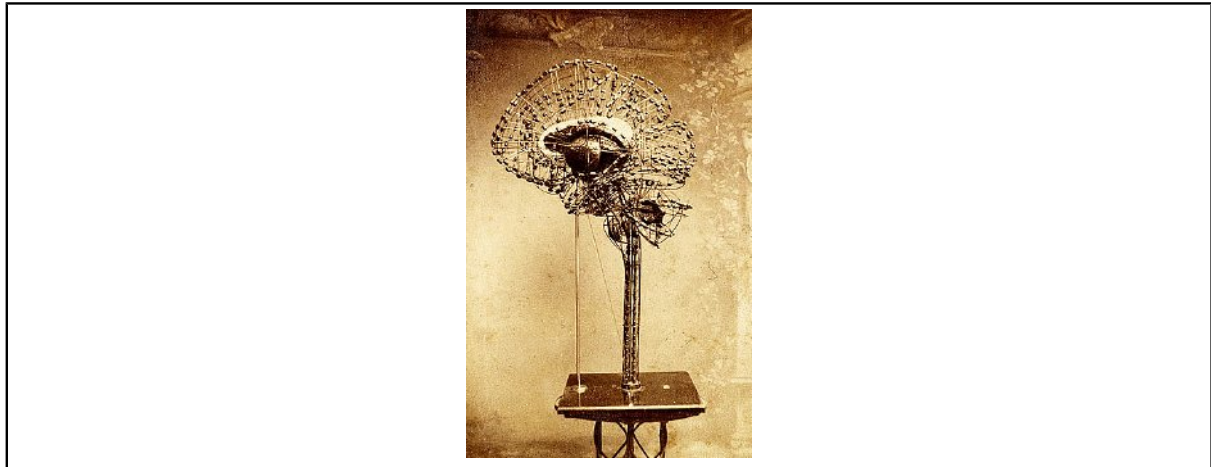
Witmer's Chronograph (left), set vertically and Cattell's falling pendulum tachistoscope (right) (Nr. 20 (chronograph) and Nr. 5 (tachistoscope))

Hipp Chronoscope with sound treatment (left, see also above) and 25kg Dynamometer (right) (Nr. 19 and Nr. 6 (dynamometer))

Heavy weights (left), Hooded lamp (center), and Light weights (right) (Nr.13 (heavy weights), Nr. 14 (lamp), and Nr. 12 (light weights))

#### **F. Buechi.** Berne, Switzerland

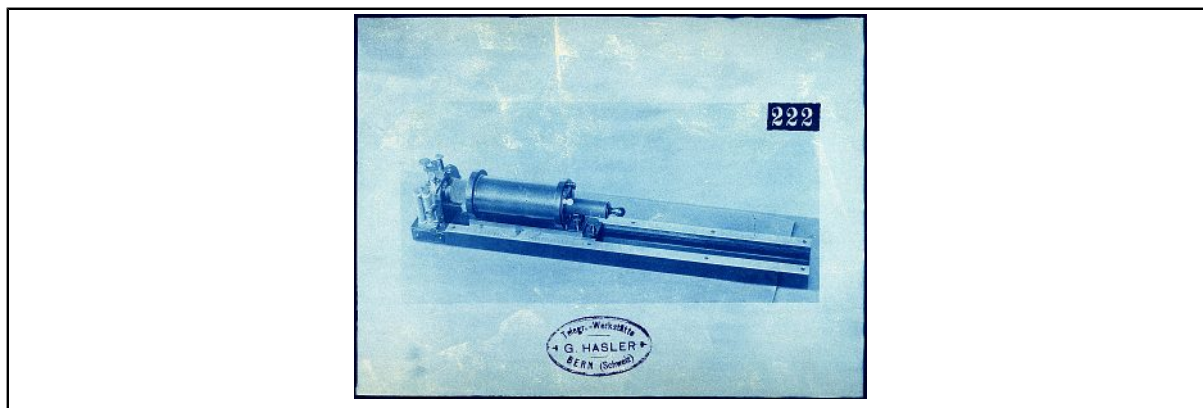
Adam Ferdinand Buechi (1843-1913), a trained *Feinmechaniker* and optician, founded his firm in Berne in 1871. Initially repair work of all kinds, the production of small apparatus and electrical installations were his main business. In the 1880s, Buechi began to focus on optical devices and glasses. When his son, Eduard Friedrich Buechi (1870-1926) entered the firm sometime in the 1890s, a new section on instrumental optics was founded. In 1900, the Buechi firm had the exclusive licence to sell Leitz microscopes and other Leitz products in central Switzerland. Buechi also supplied physiological models, particularly brain models (center and left of page) as early as 1893 (description).



Buechi's Phantom of the course of fibers of the human brain according to Christoph Aebly

### G. Hasler, Berne, Switzerland

Gustav Adolf Hasler (1830-1900) was a Swiss *Feinmechaniker* who entered the Federal Telegraph Factory in Bern in 1855 as an assistant to the director of that institution, Matthäus Hipp (1813-1893). In the early 1860s, Hipp left the Federal Telegraph Factory and moved to Neuchâtel to found his own, private telegraphy factory. Shortly later, Hasler succeeded Hipp as head of the Federal Telegraph Factory in Berne. Already during the 1850s, this factory did not only produce telegraphy equipment, but offered a wide range of scientific instruments, among them the famous Hipp chronoscope. Hasler pursued this policy. In 1861 he started the production of meteorological instruments according to Heinrich Wild (1833-1902), professor of physics in Berne and director of the Berne observatory.



Hasler's model of Du Bois-Reymond's Inductorium

In 1864 the Federal Telegraph Factory was privatized and re-emerged as the firm "Hasler & Escher". In the late 1870s, this factory ventured into the production of telephones – a branch that proved to be very successful in the following years. In 1879, Hasler's partner, A. Escher, died and the firm became Hasler's own property. With support from his son, Gustav Hasler (1877-1952), the Hasler factory expanded rapidly so that in 1909 it organized itself as a society of stock holders. In 1927, Gustav Hasler founded the FAVAG in Neuchâtel in order to incorporate the bankrupt firm Favager & Co., which under the former name of "Peyer & Favager" had been the successor of Hipp's private telegraphy factory (for catalogs of Hipp and Peyer & Favager, see, e.g., *Prix-courant Illustré de la Fabrique de Télégraphes et appareils électriques à Neuchâtel*, 1869, and *Prix-Courant de la Fabrique de Télégraphes & Appareils électriques. Fondée par M. Hipp, en 1860. Peyer, Favager & Compagnie, Catalogue B: Appareils scientifiques*, 1902)

Titchener's album includes the following blueprint photographs of Hasler instruments:

Inductorium (see also above),

Electromagnetic time marker for a kymograph using Marey's tambours

### Max Kohl, Chemnitz, Germany

Kohl was a major manufacturer and seller of instruments and his catalogues were well illustrated (see Kohl's price list No. 100, vol. I: *Unterrichts- und Laborieren-Möbel für physikalische, chemische und biologische Lehrräume und Laborieren*, vol. II: *Physikalische Apparate aus den Gebieten der Mechanik fester, flüssiger und gasförmiger Körper*, der

