

# Selling Lifts in the Late 19<sup>th</sup> and Early 20<sup>th</sup> Century

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**Abstract.** Among the most interesting artifacts associated with the history of lifts are manufacturers' catalogs. The audiences for these documents included architects, building owners, engineers, and other lift manufacturers. These catalogs typically included detailed descriptions of lift types and individual components, which were accompanied by illustrations and accounts of specific installations. The catalogs also often described normative use patterns, which allows a unique glimpse into the world of late 19<sup>th</sup> and early 20<sup>th</sup> Century lift operation. Finally, the advertised critical virtues of lift system were similar to contemporary products: they were described as safe, efficient, and economical. The catalogs examined for this paper include those published by Brady & Thornborough, R. Waygood & Company, Archibald Smith & Stevens, William Wadsworth & Sons, Ltd., and H. Breakell & Co. (Blackburn) Ltd.

## 1 INTRODUCTION

The typical lift catalog in the late 19<sup>th</sup> and early 20<sup>th</sup> century included text that highlighted the technical virtues and qualities of a company's products, illustrated various lifts and lift components or accessories, and contained testimonials from satisfied customers. Catalogs were also often published with the specific goal of educating the reader on topics such as lift safety, technology, application, and use. The goal was to lead the reader to the inevitable conclusion that the manufacturer offered the safest and most technologically innovative lift on the market, which was ideally suited to the reader's needs.

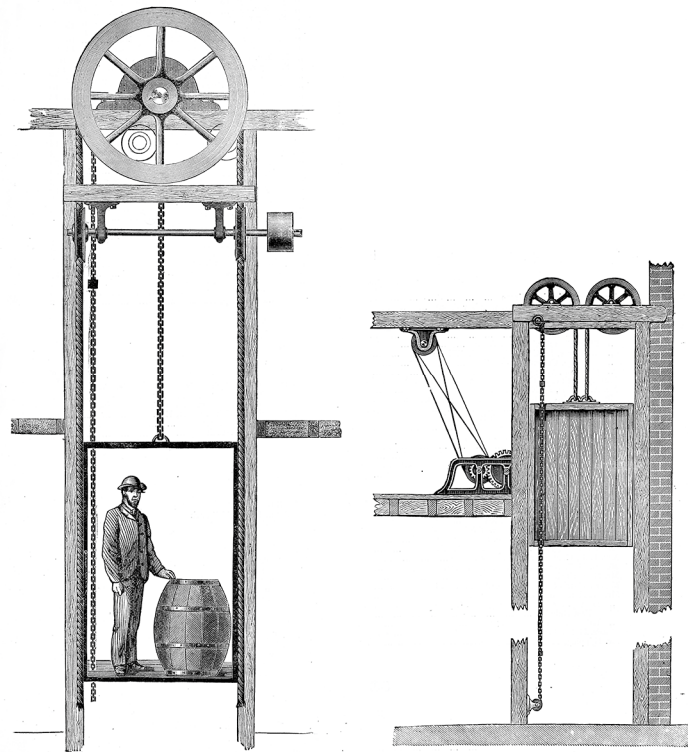
The catalog author faced a distinct challenge in that he was writing for several different audiences: engineers, architects, and building owners. In addition to these target audiences, the authors of lift catalogs also, occasionally, aimed their rhetoric at their industry rivals. Although rivals were rarely mentioned by name, the phrases and language employed often allowed readers familiar with the lift industry to perceive these subtle commercial attacks. The following examples illustrate all of the topics referenced above and also reflect the diversity of lift catalogs published during this period.

## 2 BRADY & THORNBOROUGH

Brady & Thornborough of Manchester was a typical representative of an important type of 19<sup>th</sup> century lift manufacturer. The company primarily advertised itself as "Manufacturers of Patent Revolving Shutters in Wood, Iron or Steel" [1]. However, in their advertisements this designation was often followed by – in much smaller type – a listing of their secondary line of products, which included "Improved Self-Acting Sun Blinds, Hoists and Lifts & Patent Swivel Partitions" [1]. The capacity of a general manufacturing firm to build lifts was predicated on the perceived mechanical simplicity of systems used in small commercial and light-industrial buildings.

Brady & Thornborough's 1887 catalog devoted two of its twenty-three pages to hoists and lifts. These products included hand-powered lifts, dinner lifts (dumbwaiters), and goods and passenger lifts. The latter could be powered by a gas or steam engine or by line shafting. The catalog's advertising copy is intriguing because the term *elevator* was used to describe their two primary lift systems: one was referred to as a "self-sustaining elevator" while the other was identified as a

“goods & passenger elevator” (Fig. 1). The former was essentially a hand-powered platform lift that could be fitted with a “power gear” driven by line shafting. The goods & passenger lift utilized a belt-driven winding drum machine and featured an enclosed car. Although the catalog copy referenced safety devices, the text implied that these were not standard features: “Safety apparatus is fitted to the cages, when required, on the most approved principle” [1]. This statement raises several questions about the use of safeties, such as: why would they only be installed *when required*? The use of the phrase “on the most approved principle” was also commonly employed when a manufacturer wanted to avoid having to identify a specific technical solution to a difficult problem.



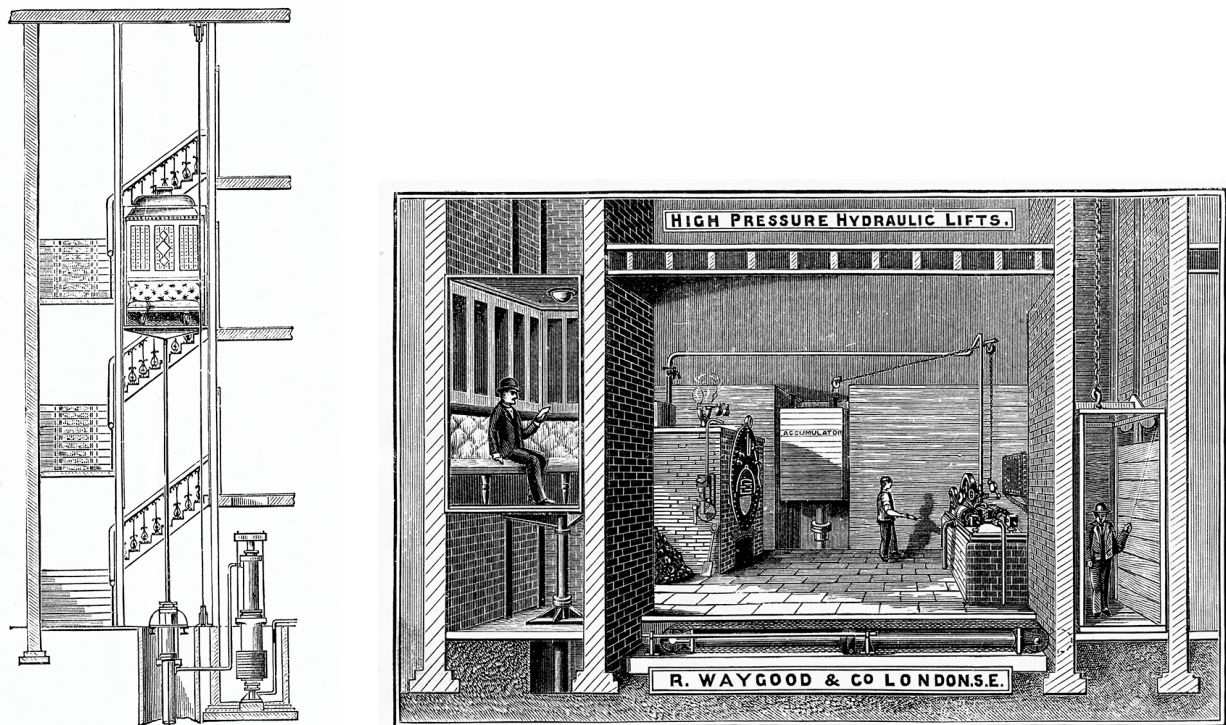
**Figure 1. Brady & Thornborough’s Self-sustaining Lift (left); Goods & Passenger Lift (right)**

### 3 R. WAYGOOD & COMPANY

R. Waygood & Co.’s 1889 catalog left no doubt about the importance of lift safety and the specific means with which it was ensured. By the late 1880s Waygood was one of the country’s leading lift manufacturers and they described themselves as “hydraulic engineers” who specialized in high and low pressure “hydraulic lifts and elevators” [2]. They also manufactured “all kinds of lifts and hoists for passengers, merchandise or food,” which were “worked by hand power, gas, or steam” [2]. The firm could readily provide “designs and estimates for fitting up lifts in clubs, restaurants, offices, hotels, mansions, factories, public and private buildings” [2]. Their catalog’s title, graphic presentation and content, reflected their commercial success and specialization. The cover title was *Hydraulic passenger Lifts: A Guide to Intending Purchasers*. The secondary, interior title was, in typical 19<sup>th</sup> century fashion, longer and even more descriptive: “Hydraulic Passenger Lifts: A comparison of the distinguishing characteristics of direct-acting and suspended lifts and of high-pressure and low-pressure systems for the guidance of those interested in the adoption of high-class work” [2].

The catalog opens with a statement about the current perception of lifts: “As the prejudice which at one time existed against Lifts (or Elevators as they are called in America,) has given place to an almost universal appreciation of their utility they are being more generally used, and ... no important edifice is considered complete by Proprietor, Architect, or Tenant without one” [2]. The reference to America and elevators is intriguing and may have hinted at an interest in expanding the company’s presence across the Atlantic. In 1889 Waygood had offices in London, Liverpool, and Birmingham, agents who represented them in Amsterdam, and a full branch office in Melbourne, Australia. Thus, the prospect of a branch office in America may have also been under consideration (in the 1890s Robert Carey of Waygood pursued two U.S. patents for hydraulic lifts).

Although the catalog provides descriptions and illustrations of three different hydraulic lifts – their Patent Hydraulic Balanced Direct-Acting Lift, Patent High-Pressure Suspended Lift, and Low-Pressure Suspended Passenger Lift – the catalog’s goal was to convince readers that “Waygood’s Patent Hydraulic Balanced Direct-Acting Lift” was the “best class of lift” available (Fig. 2). The lift employed a “companion cylinder” or accumulator that provided the required water pressure to elevate the ram and car. Although they marketed “suspended lifts,” they claimed that their direct-acting lift was “inherently safer than those which depend upon the support of chains or ropes” [2]. The direct-acting lift also had an aesthetic advantage: “In point of appearance a Direct-acting Lift balanced by hydraulic pressure commands a very marked preference, especially if the Lift is to be fixed in a handsome staircase; as this arrangement avoids the overhead beams, sheaves, and ropes or chains, which constitute a disfigurement and obstruct the light” [2].



**Figure 2. Waygood’s Patent Hydraulic Balanced Direct-Acting Lift (left); Waygood’s High-pressure Hydraulic Plant (right)**

In addition to illustrations of the three types of hydraulic lifts. The catalog includes a drawing of a “high-pressure hydraulic plant” that provided power to a direct-acting lift on one side and a suspended lift on the other (Fig. 2). A close reading of the image reveals the presence of a boiler on the left, a massive accumulator in the center, a small steam engine and pump (with an associated array valves and controls) on the right, and the horizontal hydraulic cylinder of the suspended lift located under the floor. Addition details include the well-dressed gentleman seated on the bench in

the passenger car, and the standing passenger on the right who appears to holding the lift's shipper or control rope. This relatively complete depiction of a lift mechanical room is somewhat unusual and offers a rare glimpse into this aspect of early lift history.

#### 4 ARCHIBALD SMITH & STEVENS

The title of Archibald Smith & Stevens 1905 catalog – *Notes on Electric Lifts* – emphasized the publication's educational focus. This was, in fact, the third edition of this catalog and the rationale behind its publication was clearly stated in the introduction: "In placing before you a third edition of our notes on this subject, we have taken the opportunity of bringing it up to date, and it thus becomes more than ever a Record of Results obtained in practice. The careful purchaser will place more reliance upon a sober statement of results achieved, than upon a glowing series of promises as to future performance, and we therefore submit the following notes chiefly as a statement of accomplished facts. Where deductions are drawn it should be remembered that they are based on a continually growing volume of facts, and it is gratifying to find that every statement put forward in earlier editions is fully confirmed by the additional data now available" [3]. This introduction, titled "A Record of Actual Results," represents a well-crafted advertising strategy in its precise use of words: *careful purchaser*, *results* and *practice* versus *promises*, and *accomplished facts* [3]. It compliments the potential client on their intelligence for making a decision based on facts and established a calm, confident narrative tone that was sustained throughout the catalog.

It must be remembered that, in 1905, the electric lift was a relatively new development and it faced strong competition from hydraulic lift systems, which dominated the marketplace. This context doubtless determined the focus and content of the catalog's first section: "What type of Lift shall I adopt?" This section was devoted to a detailed comparison of electric and hydraulic lifts with the goal of answering the question found in the title. The catalog's author noted: "This question confronts the Architect and the Property Owner, who, in the babel of conflicting claims, are sorely puzzled as to what they may accept as reliable. The object of these notes is to offer some assistance towards the elucidation of the problem, in the shape of a brief statement of facts culled from experience" [3]. While the "brief statement of facts" included thorough descriptions of the merits of both hydraulic and electric lifts, Archibald Smith & Stevens' primary argument was summarized in two tables.

The first table provided comparative cost data for three electric lifts, five hydraulic suspended high-pressure lifts, one hydraulic suspended low-pressure lift, and one hydraulic ram lift (Fig. 3).

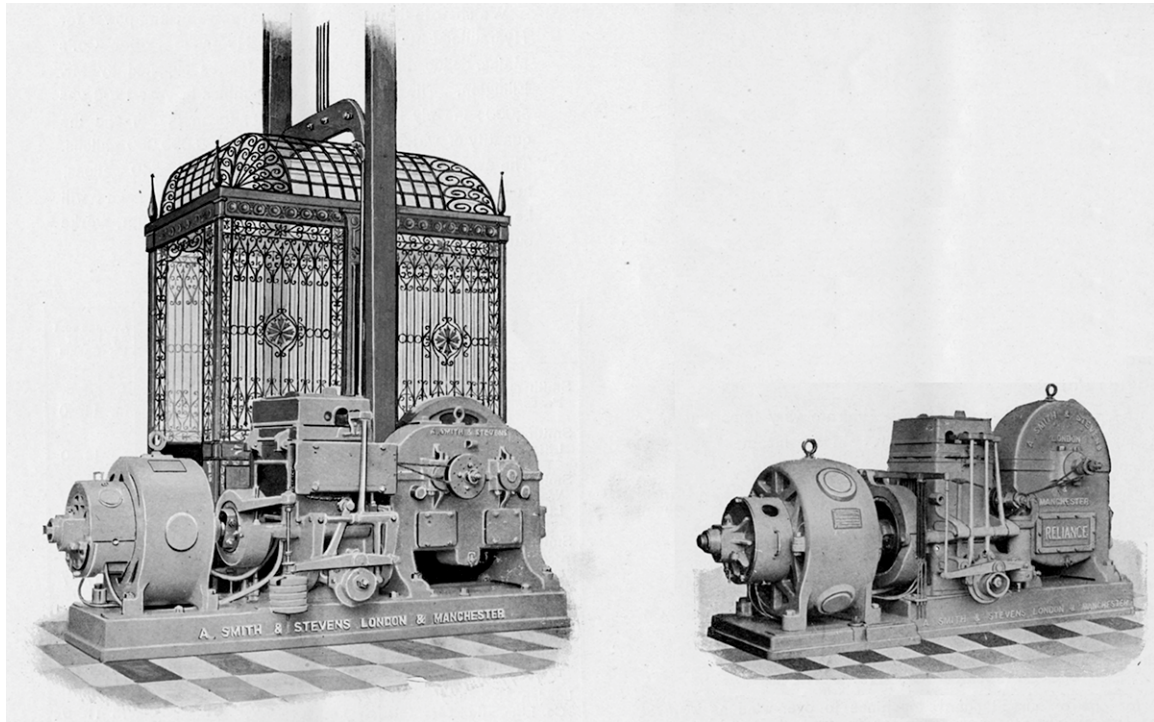


Type of Lift.	Load.	Source of Power.	Travel in Feet.	Cost of Average Round Trip Up & Down in Pence.	Number of Trips per penny.	Remarks.
Electric ... ..	7 cwt.	Birmingham Corporation ...	50	·072	13·6	Observed. Conditions ordinary. Current at 2½d. Test covered 40 round trips with full load.
Hyd. Suspended H.P. ...	7 cwt.	Manchester Corporation ...	50	·29	3·45	Calculated from Published Scale.
Hyd. Suspended L.P. ...	7 cwt.	Town Supply ... ..	50	·445	2·2	Calculated at 6d. per 1000 Gallons. Pressure, 50 lbs.
Electric ... ..	9 cwt.	Private Supply ... ..	50	·066	15	Observed. Conditions ordinary. Current at 2½d.
Hyd. Suspended H.P. ...	9 cwt.	London Hyd. Power Co. ...	50	·237	4·22	Calculated from Published Scale.
Electric ... ..	9 cwt.	Glasgow Corporation ...	50	·066	16·4	Observed. Current 2½d.
Hyd. Suspended H.P. ...	9 cwt.	Glasgow Corporation ...	50	·212	4·7	Calculated from Published Scale.
Hyd. Suspended H.P. ...	12 cwt.	London Hyd. Power Co. ...	50	·287	3·48	Observed.
Hyd. Suspended H.P. ...	9 cwt.	London Hyd. Power Co. ...	50	·235	4·25	Observed.
Hydraulic Ram. H.P. ...	12 cwt.	London Hyd. Power Co. ...	50	·344	2·9	Observed.

**Figure 3. Table 1. Comparative Cost of Working Hydraulic and Electric Lifts, Archibald Smith & Stevens, *Notes on Electric Lifts* (1905)**

The table includes information on load, power source, travel distance, average round trip cost, and number of trips per penny. The efficiency and economy of the new technology was evident by the fact that the three electric lifts made an average 15 trips per penny while the seven hydraulic lifts made an average 3.6 trips per penny. The table also includes a column titled “remarks,” which indicates how the cost data was determined: in six cases the lift was “observed” and in four cases the information was “calculated from published scale” [3]. Although the term “observed” is undefined, if it is assumed to mean both the literal observation of a machine in action and the accurate measurement of its power consumption, then the data contained in the table supports Archibald Smith & Stevens’ statement of using facts and actual results to assert their claim of greater efficiency. The second table provided annual operational cost figures for the company’s various electric lift types with the detailed cost figures given in pounds, shillings and pence. The average annual electric lift cost was £8 5s. 4d., while the average annual cost of operating a hydraulic lift was £15 11s. These tables, and their associated text, allowed Archibald Smith & Stevens to proclaim: “The only conclusion possible is that the Electric Lift is relatively a most economical machine as regards power” [3]. The statement’s wording is a perfect example of a *mostly* definitive statement that is carefully modified by the word “relatively.”

The remainder of the catalog addressed a variety of topics including repairs, types of current, machine drives (direct coupled or belt and counter shaft), and controls (hand-rope, electric switch or push button). The catalog noted that, when the company “first commenced the manufacture of electric machines” they were “doubtful” regarding the annual repair costs associated with this new technology [3]. However, after “a few years of practical working” they realized that the annual repair cost was “almost negligible” and that a “well designed electric lift” required “less repair than any other form of lift” [3]. A survey of repair work they had done on their machines revealed that the annual cost to their customers was £2 19s. The other technical features are described with the same clear, straightforward prose employed throughout the catalog. In addition to this precise prose, the catalog also contained thirteen black-and-white photographs: eleven that depict various lift machines and two that depict passenger machines with cars (Fig. 4).



**Figure 4. Archibald Smith & Stevens' Passenger Lift with Art Ironwork Cage and Four-pole Motor with Balanced Gearing (left); Ten cwt. Passenger Gear, 1902 Pattern (right).**

The catalog's final section had a question for a title: "What are the essentials of a good electric lift?" Archibald Smith & Stevens' answer to this question was predictable: "Our best answer to this question is obviously a description of the machine which we have gradually perfected during several years of manufacturing experience, combined with close observation of results" [3]. While this statement reinforced the integrated themes of practical experience and a results-based-design strategy, the general description of their electric lifts that followed was aimed at their competitors: "Our electric lift is not a miscellaneous collection of unrelated parts separately designed for various purposes, and gathered together from all quarters, but is a carefully considered and harmonious arrangement, designed specially for the purpose in view, every detail being in perfect relationship to its fellows, and specially adapted to the peculiar requirements of lift service" [3]. It was common practice in the early 20<sup>th</sup> century for electric lift manufacturers to build the winding drum, safeties and mechanical components and then purchase the electric motor, controller and other electrical components from companies that specialized in their production. Only the leading companies had the resources to manufacture an entire electric lift system. Archibald Smith & Stevens also sought to set themselves apart from their perceived leading industry rivals. They described their electric lift as "the first, and we believe, so far, the only entirely British-made machine on the market" [3]. This statement was likely aimed at Otis who had established the American Elevator Company in London in 1885, which had become the Otis elevator Company, Ltd. (London) in 1900.

## 5 WILLIAM WADSWORTH & SONS, LTD.

Whereas Archibald Smith & Stevens quietly claimed to build the “only entirely British-made machine on the market,” William Wadsworth and Sons, in their circa 1920 catalog proudly proclaimed (in bold type face) that their electric lifts were “British Built Throughout” [4]. In fact, this phrase appeared throughout their catalog, which was titled *Wadsworths Lifts, Transporters, Hoisters*. The 168-page catalog was not, however, evenly divided between these three topics. Information on electric lifts filled 120 pages, with 36 pages devoted to transporters (self-landing and delivering hoists) and 12 pages addressed hoisters (job cranes, friction hoists, hand lifts, etc.). The catalog’s graphic design also reflected this content division: each page had a decorative border that featured the company’s name, hoisting sheaves, lift machines, and a declarative phrase. In the section on passenger and goods lifts Wadsworth announced that they were “Electric Lift Specialists” and in the sections on transporters and hoisters they were simply “Engineers” [4]. Other more subtle differences in the border design included different engines, gearing, and the presence of a car versus a lorry (Figs. 5 & 6).



**Figure 5. Header and Footer Design, *Wadsworths: Lifts, Transporters, Hoisters* (c. 1920).**

Wadsworth’s catalog copy embraced several of the themes employed by Archibald Smith & Stevens, however, the landscape of the lift industry had clearly shifted during the 15 or so years between the two publications. Wadsworth claimed that electric lifts were now “superseding the earlier types of hydraulic and belt-driven lifts” [4]. While the gradual ascendance of the electric lift in the marketplace was perceived as sign of modernity, older technologies and/or operating systems were still present in significant ways. The presence of a 24-page section on belt-driven goods lifts served as a reminder that one of the first means of powering lifts – the belt drive – remained a common feature in British factories. According to Wadsworth: “In works where mechanical power is available, or the cost of an Electric Lift is prohibitive, a Belt-driven Lift is a safe and efficient





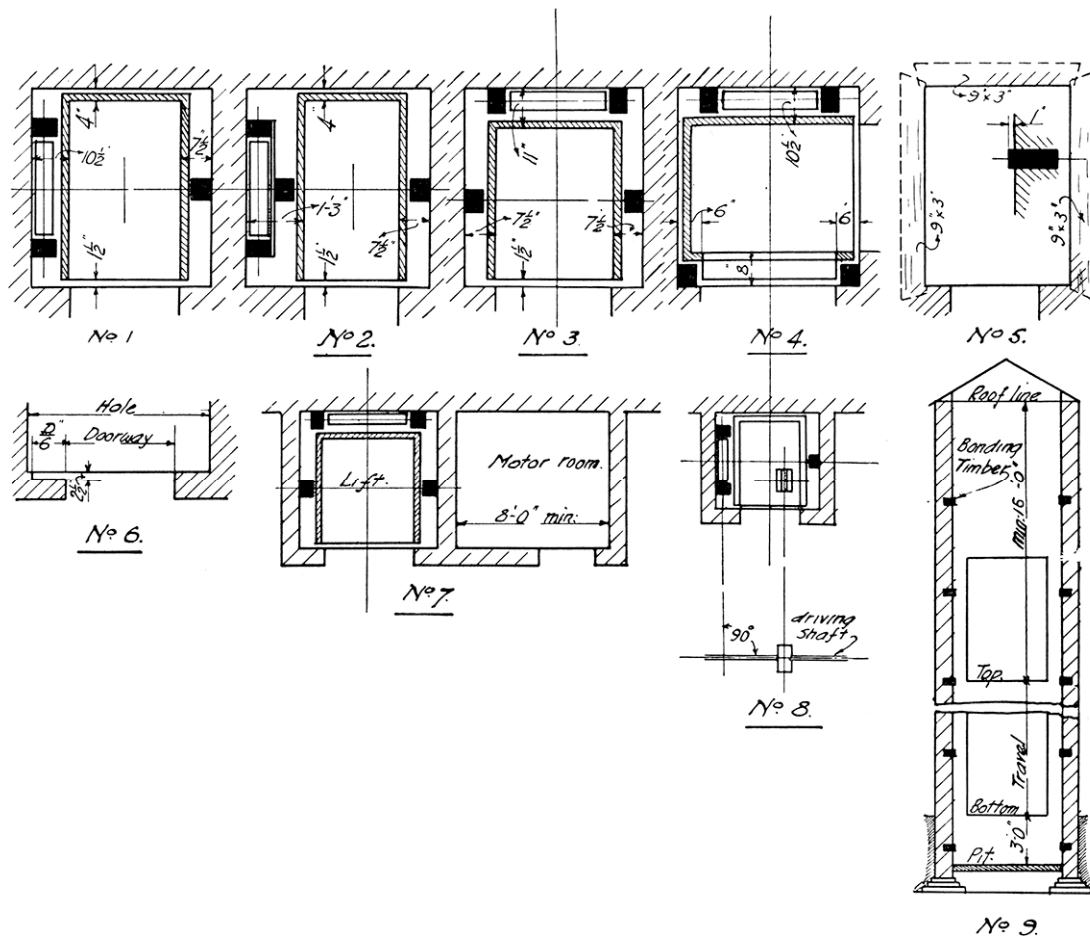
**Figure 6. Header and Footer Design, Wadsworths: Lifts, Transporters, Hoisters (c. 1920).**

machine” [4]. These lifts were also often controlled by shipper or hand ropes, the first means of lift control that was introduced in the early 1800s. However, while one goal of the catalog was to introduce the potential client to the full range of lifts manufactured by Wadsworth – which included older systems – the clear focus was on the modern electric lift. Thus, in addition to hand rope controllers, the catalog included detailed descriptions of car switch, semi-automatic push button, and automatic push button control systems.

Wadsworth also emphasized that the company was dedicated to lift manufacturing and they echoed, on a catalog page titled *A Caution*, Archibald Smith & Stevens’ warning about *certain types* of rivals: “The *Bete Noir* of a Lift-maker or User are the firms who play at being Lift-Engineers. They purchase various parts from different sources – a gear box from this firm, a controller from that firm, and so on. They assemble the parts together and then style themselves *Lift-makers*” [4]. Wadsworth urged readers not to be “misled by such firms, otherwise your experience may be sad and expensive” [4]. They also reported that their electric lift motor was “specially built” to their specifications by a “first-class firm,” noting that this was “the only portion” of their lifts sub-let to another manufacturer, with all other parts manufactured “under expert supervision” in their works [4]. They also stated that each lift was subjected to a “severe *running* test” prior to leaving the factory. Wadsworth summed up its approach by noting that, while their lifts were not the lowest price in the first cost, they represented the “highest quality at a reasonably low price,” reminding readers that “the cost of a good lift is soon forgotten, but the quality is well remembered” [4].

A common feature of many lift catalogs was information required when ordering lifts or seeking estimates. Wadsworth recommended that clients seeking estimates provide the following information: “maximum load, height of travel and number of landings, speed, size of car or well-hole, class of lift required (whether for passengers or goods, or for both), current supply available (if alternating, also phase and periodicity), and method of control” [4]. The catalog also included a series of plans intended to help readers determine the car size and shaft dimensions. The drawings provided, and their accompanying text, addressed various counter weight, guide rail and engine locations and illustrated the versatility of lift design: for example, cars could have one, two or three doors. General information included proper placement of the shaft bonding timbers, the height required above the car (depending on machine location), pit depth, car area per passenger (three square feet was recommended) and basic shaft dimensions. The latter were interesting in that all dimensions were given from the interior of the shaft wall to the interior of the car (Fig. 7).



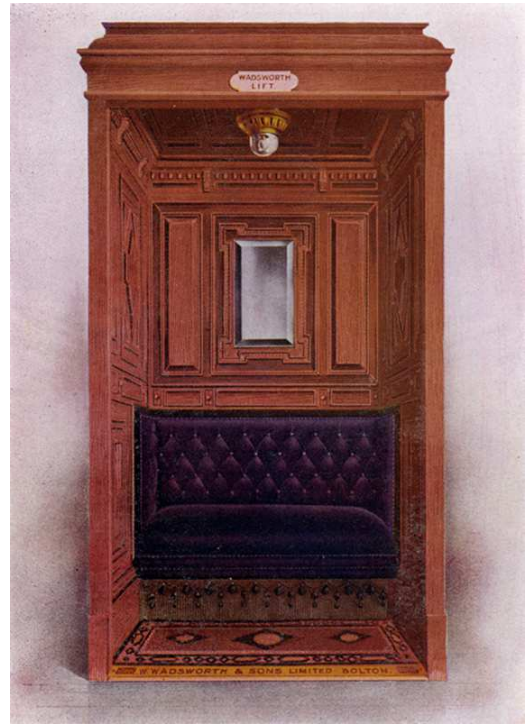


**Figure 7. Lifts Plans and Section: “How to determine the size of car and dimensions of lift well,”** *Wadsworths: Lifts, Transporters, Hoisters* (c. 1920).

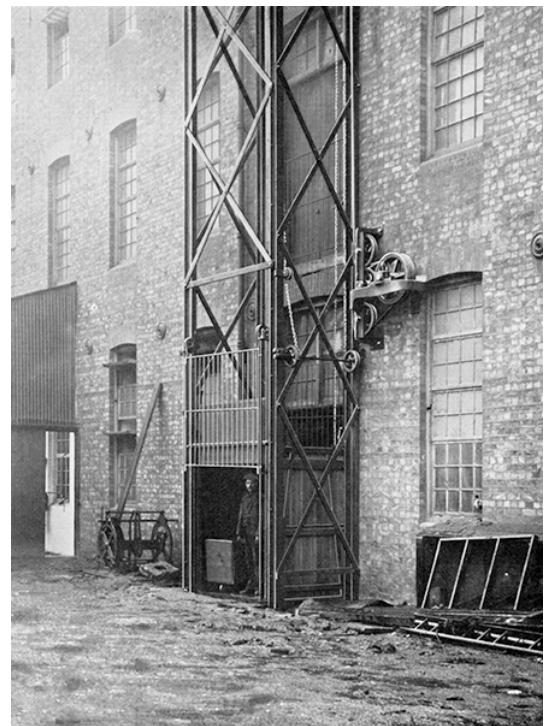
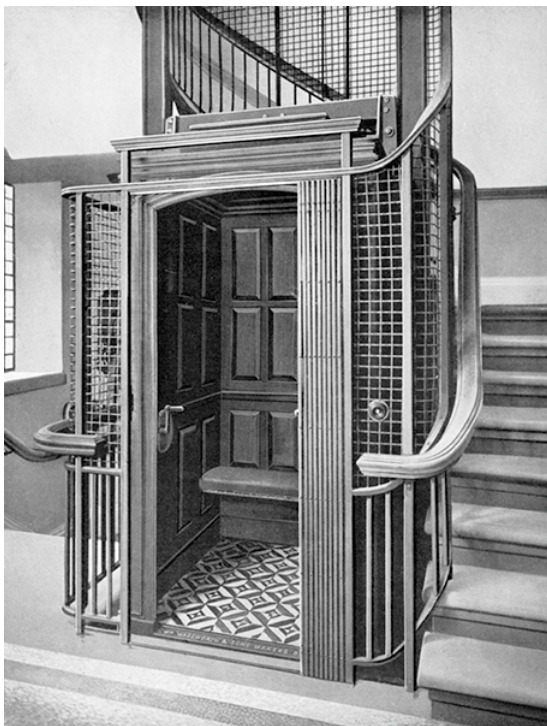
In addition to manufacturing lifts Wadsworth also provided an inspection service. The company stated that they had “inaugurated, some time ago, a system of inspection, which has made such rapid strides during the past two or three years, giving such excellent results, proving economical, and saving our customers much trouble and annoyance, that we are now enabled to keep a regular staff of practical engineers for carrying out such inspections” [4]. Wadsworth recommended that their *practical engineers* inspect lifts “three or more times per annum” [4]. After each inspection the client received a report on the lift’s condition and the repair work required (if any). The costs associated with this service depended on the type of lift machine and the number of inspections per year. The prospective of inspecting a lift *three or more times each year* may reflect – in spite of its increased commercial popularity – concerns associated with the relative newness of the electric lift and unknowns about its operation over long periods of time.

The Wadsworth catalog’s 175 illustrations feature an extraordinary collection of color and black-and-white photographs of lift machines, components, and cars (Figs. 8-10). The various components illustrated include gates, limit switches, automatic floor setters, direction limit switches, controllers, speed governors, slack cable switches, automatic screw cut-off switches, safety catches, and lift enclosures. The machine types illustrated include direct-connected electric passenger and goods lifts as well as belt-driven goods lifts. Although the information associated with each image varied, it permits a glimpse into the commercial and industrial settings of these lifts. Passenger lifts were depicted in hotels, infirmaries, offices, public buildings, and an art gallery and a jeweler. Goods lifts were depicted in a variety of factories, works and warehouses including a boot factory, furniture works, soap works, rubber works, cloth warehouse, and railway stations. Other specialized lifts,

such as automobile lifts, were also illustrated. The images of belt-driven goods lifts and transporters are also of particular interest in their depiction of early 20<sup>th</sup> century industrial buildings.

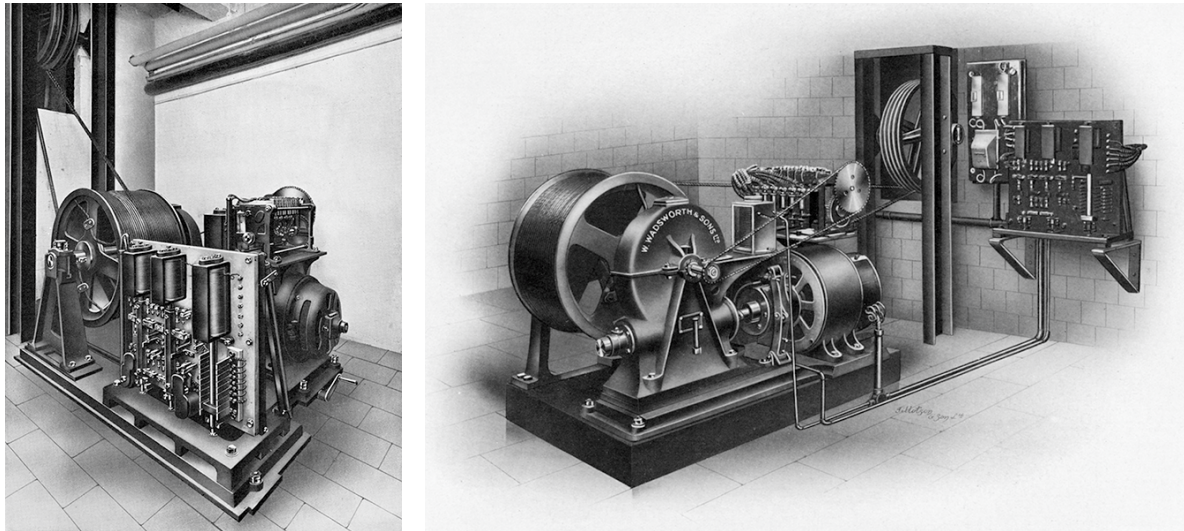


**Figure 8. Electric Passenger Lift (left); Passenger Lift Car E7. Wadsworths: Lifts, Transporters, Hoisters (c. 1920).**



**Figure 9. Passenger Lift in Offices (left); Belt-driven Goods lift (right). Wadsworths: Lifts, Transporters, Hoisters (c. 1920).**





**Figure 10. Electric Passenger Lift Winding Drum (left); Electric Goods Lift (right).**  
*Wadsworths: Lifts, Transporters, Hoisters (c. 1920).*

## 6 CONCLUSION

Although the collection of catalogs examined for this paper is limited in number, their relative age, size, scope and focus represent a reasonably comprehensive cross section of the most common catalog types published during this period. Brady & Thornborough's comprehensive catalog featured their full range of products, with lifts given the same emphasis as self-acting sun blinds. While Waygood sought to educate prospective "intending purchasers" on the virtues of their lifts, Archibald Smith & Stevens saw themselves as educating about and advocating for the newest lift technology. Wadsworth's massive catalog represented the range of electric lift types manufactured in the early 20<sup>th</sup> century, illustrating the sustained presence of older technology alongside the latest innovations. Finally, the language associated with selling lifts reflects the culture that produced it and, in many ways, resonates with contemporary advertising copy that seeks to convince potential customers to buy one lift over another.

## 7 REFERENCES

- [1] Brady & Thornborough, *Manufacturers of Patent Revolving Shutters in Wood, Iron or Steel, Improved Self-Acting Sun Blinds, Hoists and Lifts & Patent Swivel Partitions* (1887).
- [2] R. Waygood & Co., *Hydraulic Passenger Lifts: A Guide to Intending Purchasers* (1889).
- [3] Archibald Smith & Stevens, *Notes on Electric Lifts* (3<sup>rd</sup> edition) (1905).
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## BIOGRAPHICAL DETAILS

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