Selling Lifts in the Late 19th and Early 20th 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. 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 19th and early 20th Century lift operation. Finally, the advertising language used to describe the mechanical virtues of a manufacturer's lift systems is similar to contemporary catalogs: lifts 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, and William Wadsworth & Sons, Ltd.

Keywords: History, Lift Manufacturers, Catalogs.

1 INTRODUCTION

The typical lift catalog in the late 19th and early 20th Century included text that highlighted the technical virtues and qualities of a company's products, illustrations of lift systems, and testimonials from satisfied customers. Catalogs were also occasionally published with the specific goal of educating the reader on topics such as lift safety, innovative technology, and proper application and use. The goal was to lead the reader to the inevitable conclusion that a given manufacturer offered the safest and most technologically advanced lift on the market, which was also, of course, 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 often 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 the target of 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 19th century lift manufacturer. The company was known throughout England as a leading manufacturer of revolving wood, iron and steel shutters. The cover of their 1884 catalog highlighted this fact and also listed a range of secondary products, which included "Improved Self-Acting Sun Blinds, Hoists and Lifts & Patent Swivel Partitions" [1]. However, only two of the catalogs twenty-three pages where devoted to lifts and hoists, which included goods (freight) lifts, goods and passenger lifts, and dinner lifts (dumbwaiters). Brady & Thornborough apparently added lifts to their product line in the early 1880s, a decision that was, perhaps, predicated on the perceived mechanical simplicity of lift systems.

One of the most interesting aspects of their catalog is its consistent use of the term *elevator*. No American connection to Brady & Thornborough has been found that explains the use of this term;

in England the word *elevator* typically referred to continuous material conveyors while *lift* was used for freight and passenger carriers operating in vertical shafts. The firm's goods or freight lift was identified as both a "self-sustaining elevator" and a "power lift" and was described as follows:

> The power lift has been specially designed to be worked by hand when the engine is stopped by any cause. The power gear may be fixed at any part of the height of lift where most suitable, and operates by pulling the hauling rope, by compressing it between revolving wheels. Automatic stops have fixed at top and bottom of the starting chain so that the cage stops itself. Safety apparatus can be fitted to the cage, to prevent it falling in case the chain breaks. Two hemp ropes in addition to the chain can be fitted to the cage, and running over additional V pulleys at top to the balance weight. This is recommended when the lift is constantly used for passengers, as it is very improbable that the chain and two hemp ropes would break at one and the same time [1].

This description, coupled with a careful reading of the power lift illustration, prompts several questions (Fig. 1). The starting chain does not appear to have a direct connection to the gearing or engine. In fact, given the location of the belt sheave on the power gear, the starting chain is on the wrong side of the platform. The bottom of the shaft is not shown, thus the reader has to assume that a typical endless hand rope is employed. The illustration includes two lightly drawn sets of circles that imply the presence of deflecting sheaves for the hoisting and counterweight chains. The schematic nature of these circles may be an indication the drawing was not completed prior to its use in the catalog. Lastly, if the hand rope were to be used to power the lift in the case of an engine failure, given the path of the hosting rope through the power gear, the operator would likely have struggled to pull against the idle engine's mechanical action.

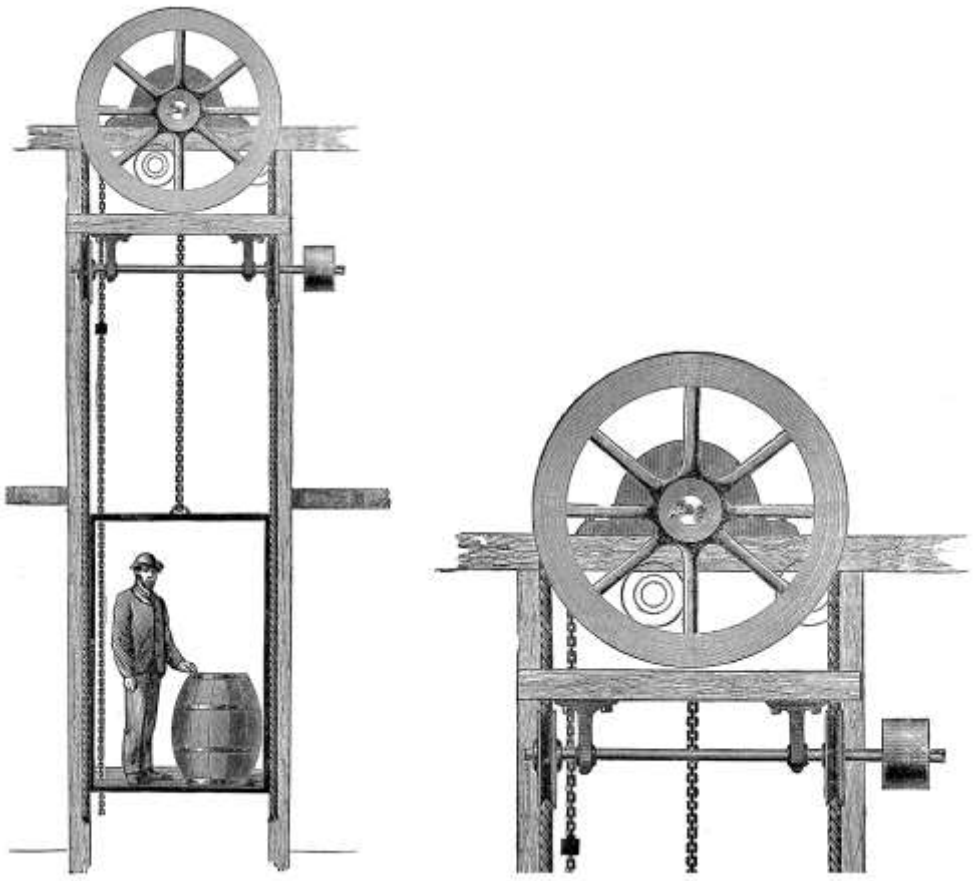


Figure 1 Brady & Thornborough's 1884 Goods Power Lift (right)

& detail of power gear and hoisting sheave (left)

The description and illustration of Brady & Thornborough's "improved goods & passenger elevator" was, perhaps, slightly more convincing:

> These elevator machines are entirely self-contained, which allows of being fixed in any position upon or under any floor. They are fitted with spiral drum to receive the steel wire rope. Cages are strongly made of well seasoned wood, bolted, and tied with iron. Safety apparatus is fitted to the cages, when required, on the most approved principle. Balance frames, with loose bars for adjustment, are supplied, the over-head wheels being turned in the lathe, to prevent chafing of ropes. A hand chain for starting and stopping passes through the cage, the whole height of the lift. This is far preferable to either hemp or steel ropes, as it does not stretch. These elevator machines are made to work automatically, stopping themselves level with the floors at top and bottom of travel [1].

This text, when compared to the accompanying illustration, prompts fewer questions about the lift's operation (Fig. 2). However, the statement regarding safeties, that they are only installed *when required* (which echoes the statement found in the description of the goods lift that safeties *can be fitted* to the lift), prompts an obvious question: when would safeties not be desired or required? Also, the phrase "on the most approved principle," was most commonly employed when a manufacturer wanted to avoid having to identify a specific technical solution to a difficult problem. The issue of safety was also somewhat ignored in the suggested use of steam engines to power passenger lifts. The earliest accounts of lifts in England reported a distinct preference for hydraulic systems due to concerns about safety and maintenance costs associated with the use of steam engines. This fact, when added to the other concerns noted above, clearly indicates that Brady & Thornborough underestimated the mechanical complexity of lifts and, perhaps, lacked a thorough understanding of lift technology.

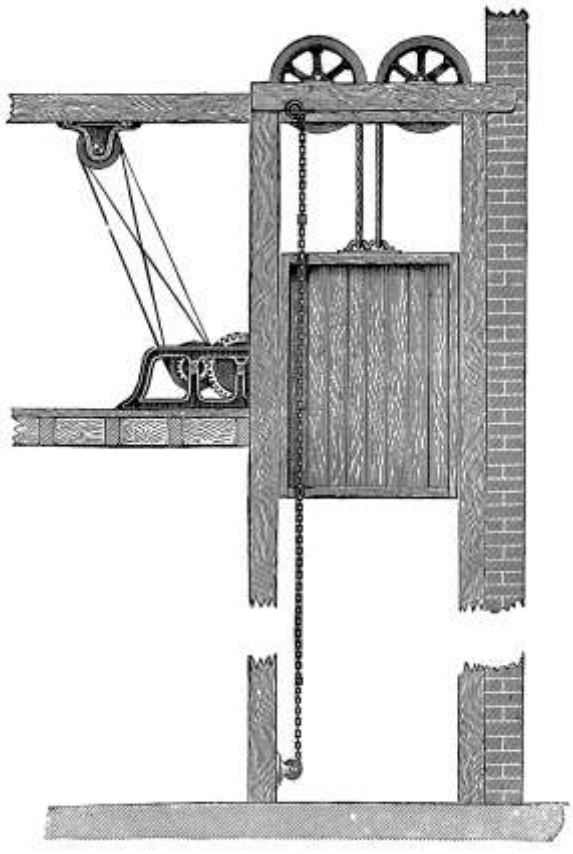


Figure 2 Brady & Thornborough's 1884 Improved Goods & Passenger Elevator

3 R. WAYGOOD & COMPANY

By the late 1880s R. Waygood & Co. had established itself as one of England's leading lift manufacturers and their 1889 catalog, titled *Hydraulic passenger Lifts: A Guide to Intending Purchasers*, illustrated the difference between a company that specialized in lifts and firms such as Brady & Thornborough. However, a somewhat puzzling similarity between the two firms was the fact that Waygood also used the term elevator. They described themselves as: "Hydraulic Engineers and manufacturers of hydraulic lifts and elevators – high and low pressure" [2]. The term was employed a second time in reference to the company's product line, which was described as "lifts (or elevators as they are called in America)" [2]. This latter reference may have hinted at an interest in expanding the company's presence across the Atlantic. By 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).

The catalog's first page outlined the company's products, services and locations. And, although they specialized in hydraulic lifts, they also noted their ability to manufacture "all kinds of lifts and hoists for passengers, merchandise or food, worked by hand power, gas, or steam" [2]. They also advertised their ability to provide "designs and estimates … for fitting up lifts in clubs, restaurants, offices, hotels, mansions, factories, public and private buildings" [2]. This list of building types was repeated in the catalog's introduction, which also addressed the increasing popularity of lift usage: "As the prejudice which at one time existed against Lifts … has given place to an almost universal appreciation of their utility they are being more generally used, and the public is now accustomed to find one or more lifts in most large hotels, Stores, and Buildings occupied as residential Chambers or Offices, that no important edifice is considered complete by Proprietor, Architect, or Tenant without one" [2]. The perceived need to repeatedly list a variety of potential lift applications serves as a reminder that lift use in England was, in spite of its increasing popularity, not yet commonplace in the 1880s.

Although, as noted above, Waygood had the resources to build lifts worked by hand, gas, or steam power, there was no question that their primary focus was manufacturing hydraulic lifts. In fact, this was the catalog's focus, which was clearly stated on the interior title page: "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 comparison of direct-acting and suspended lifts opened with a general introduction of direct-acting lifts in which Waygood noted that: "Most high class Lifts are made on this plan, especially in cases where silence, smoothness, and steadiness of working are held to be of the first importance. Their chief recommendation, however, lies in the fact that as a class they are inherently safer than those which depend upon the support of chains" [2]. A primary design challenge was the need to effectively balance or off set changes in water pressure and usage as the ram and car rose higher in the shaft:

> The older – and, so it must be said, the commoner method – is to effect this balancing of the dead load by iron weights which are hung by ropes or chains, carried over sheaves at the top of the Lift-shaft and attached to the car. If systematic or continual attention to the condition of these balance chains or ropes could be insured, they might be accepted as a means of balancing the dead load, devoid of danger; there is, however, in lifts so balanced, an element of possible weakness in … the attachment of the ram to the underside of the cage " [2].

Lifts that employed the system outlined above were described as suspended hydraulic lifts.

Waygood offered their patented design as the answer to the perceived dangers found in this older approach:

> The only method … of balancing the weight of the ram or car of a direct acting lift which is absolutely correct in principle, is to obtain such a water pressure to raise the live load as will suffice to also raise the ram and car. This additional pressure is obtained without any additional cost of working, or any additional consumption of water, by the means employed in **Waygood's Patent Balanced Hydraulic Lift** in which the water admitted to the lift cylinder is taken from a companion cylinder loaded with iron weights [2].

The drawing of their balanced hydraulic lift (Fig. 3) illustrated the presence of the companion cylinder, or accumulator, as well as highlighting another key feature of this system: "In point of appearance a Direct-acting Lift balanced by hydraulic pressure commands a very marked preference, especially if the Lift is to 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].

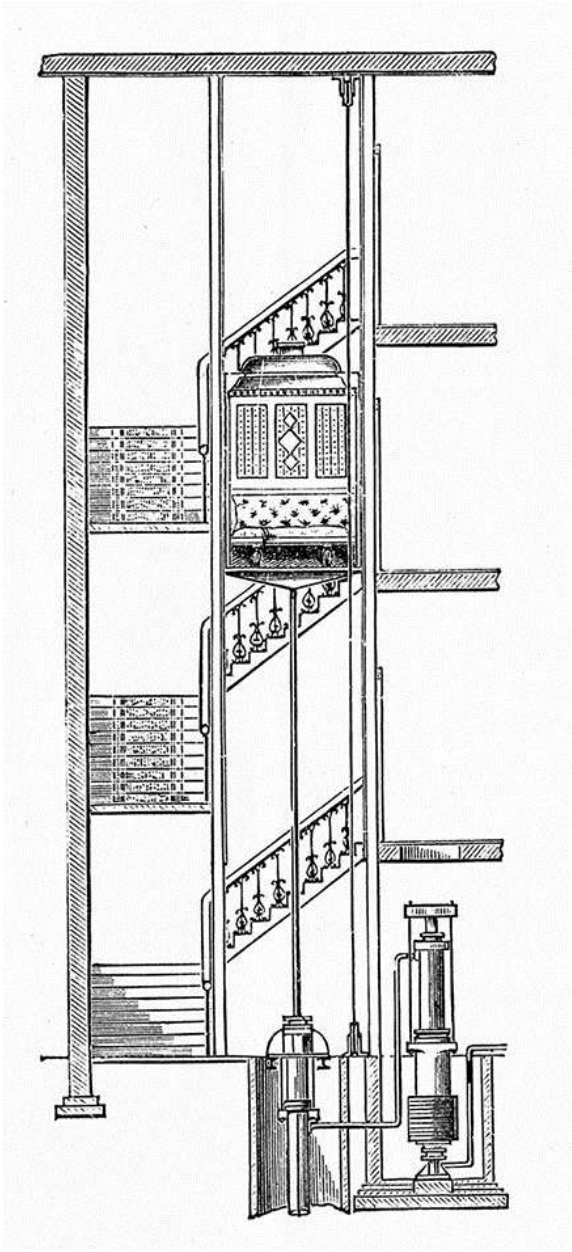


Figure 3 Waygood's Patent Balanced Hydraulic Lift

Although the catalog's primary focus was the promotion of Waygood's balanced hydraulic lift, it also included brief descriptions of two suspended lift types. One was a high-pressure system that employed a vertical cylinder and ram and the other was a low-pressure system that employed a horizontal cylinder with two sets of multiplying sheaves (one fixed and one moving) (Fig. 4). The latter system closely resembled a hydraulic lift system developed in the United States in the early 1870s.

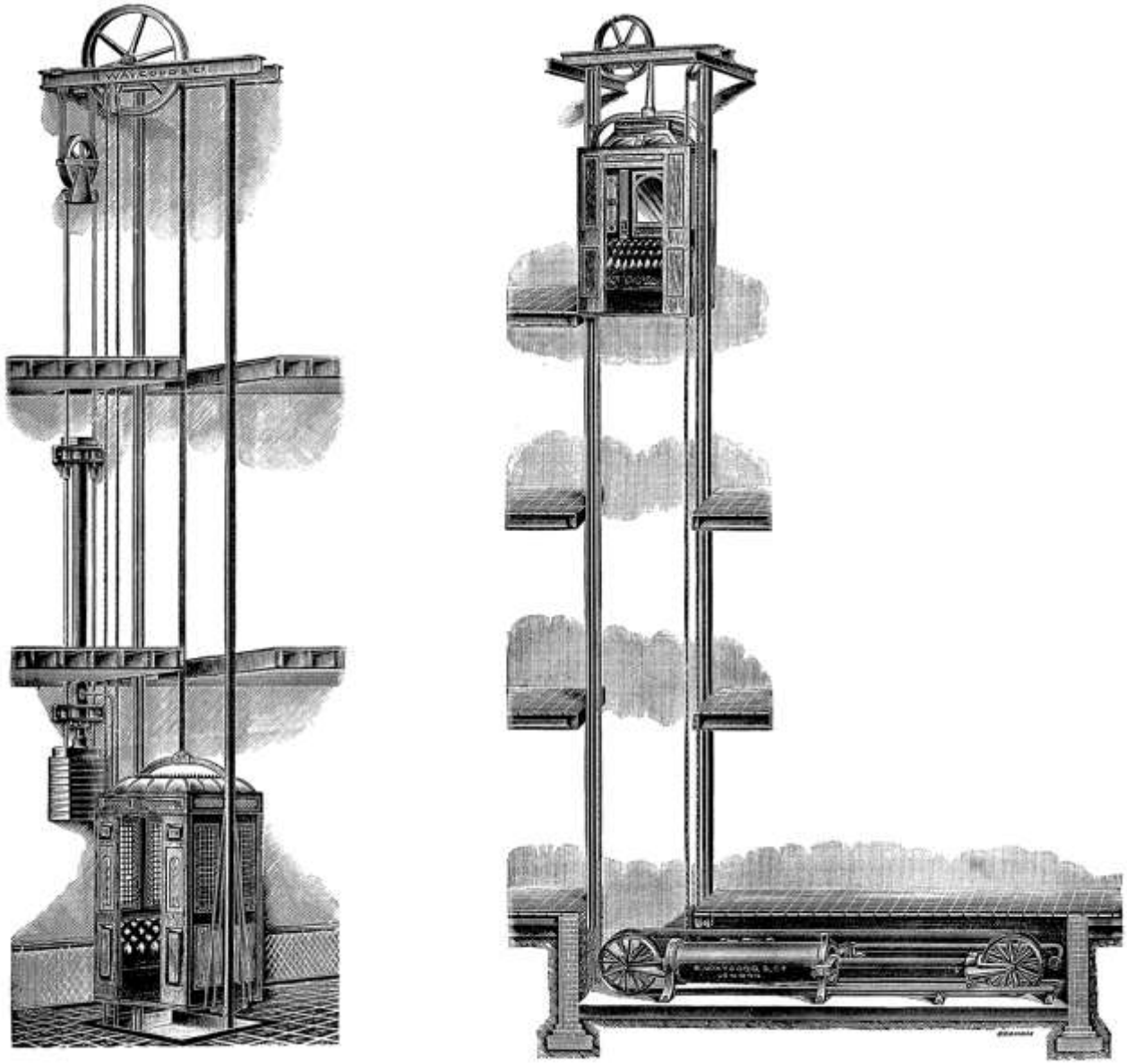


Figure 4 Waygood's High Pressure Suspended Lift (right)
& Low Pressure Suspended Lift (left)

In addition to illustrations of Waygood's hydraulic lifts, the catalog included a drawing of a "high-pressure hydraulic plant" [2]. A close reading of the image reveals the presence of two elevators: a direct acting passenger lift on the left and a suspended goods lift on the right. The center of the drawing illustrates the mechanical room with a boiler on the left, a massive accumulator in the center and a small steam engine and pump (with an associated array of valves and controls) on the

right (Fig. 5). The horizontal hydraulic cylinder of the suspended lift is located under the mechanical room floor (perhaps not the best location for future maintenance). Additional 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.

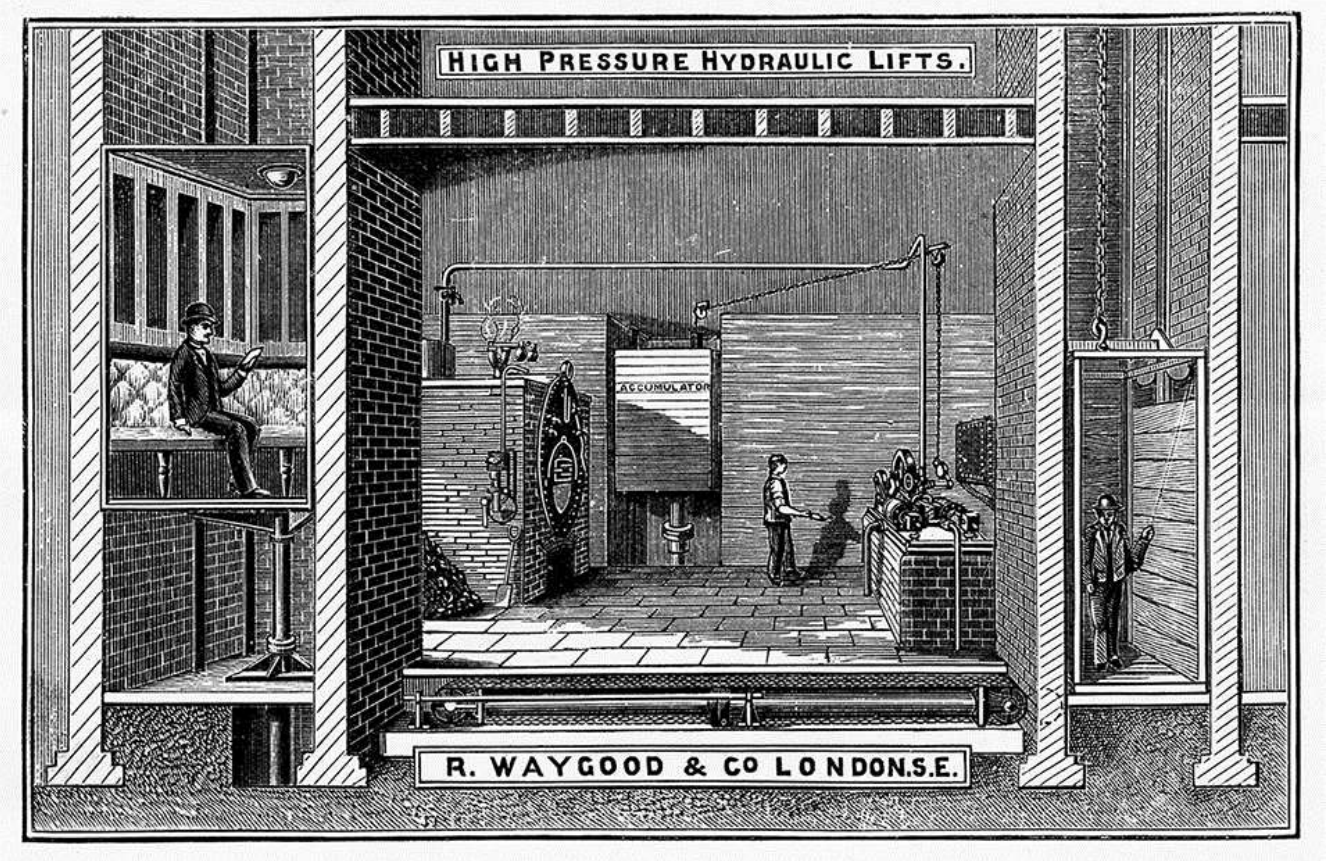


Figure 5 Waygood High-pressure Hydraulic Plant

The catalog also provides general insights into hydraulic lift use in England in the 1880s. Most low-pressure systems operated with water supplied directly from city water mains or from tanks located at the top of the building. The maximum pressure provided by these systems rarely exceeded 40 psi. The exceptions were cities such as Liverpool, Nottingham, Brighton and Eastbourne: "where the water is brought from sources high in the surrounding hills" [2]. In these cities the water pressure reportedly varied from 40 to 120 psi. Waygood's high-pressure system provided, through the lift's accumulator, a typical operating pressure of 700 psi. The catalog also reported that numerous companies had been founded to create urban high-pressure water distribution systems. The best known of these was the London Hydraulic Power Company, however similar companies also operated in Hull, Liverpool, Melbourne and Sydney. Finally the catalog reported that the average height of lift travel in England during this period ranged between 50 and 70 feet.

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*, *practice* versus *promises*, and *accomplished facts*. The introductory text complements the potential client on their intelligence for making a decision based on facts and it employs a calm, confident narrative tone that is sustained throughout the catalog.

It must be remembered that, in 1905, the electric lift was a relatively new development and it faced strong completion 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. 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 effectively 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. 6).

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.

N.B.—Corrected by L. H. P. Co., 1904 Scale.

Figure 6 Archibald Smith & Stevens
Comparative Cost of Working Hydraulic and Electric Lifts

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 indicated how the cost data was determined: in six cases the lift was "observed" and in four cases the information was "calculated from published scale." 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 confirms Archibald Smith & Stevens' statement of using facts and actual results to support their claim of greater efficiency.

Whereas the first table did not identify specific lift manufacturers, 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 (Fig. 7). 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 an apparently definitive statement that is carefully modified by the word "relatively."

	Load.	Travel.	Average cost of Power per Annum.
			£ s. d.
Smith & Stevens Electric Passenger Lifts. Private.	6 cwt.	40ft. to 60ft.	2 14 0
Smith & Stevens Electric Lifts. Alternating Current	6 cwt. to 10 cwt.	40ft. to 60ft.	3 14 0
Smith & Stevens Electric Warehouse and Factory Lifts	6 cwt. to 30 cwt.	40ft. to 70ft.	5 9 3
Smith & Stevens Electric Passenger Lifts in Offices and Flats	6 cwt. to 12 cwt.	40ft. to 80ft.	8 17 7
Smith & Stevens Electric Passenger Lifts in Hotels	9 cwt. to 12 cwt.	40ft. to 80ft.	29 9 5
Smith & Stevens Electric Lifts, all classes	6 cwt. to 30 cwt.	40ft. to 80ft.	8 5 4
London Hydraulic Power Co. Lifts, all classes ...			15 11 0

Figure 7 Archibald Smith & Stevens
Comparison of Operational Costs of Electric and Hydraulic Lifts

The remainder of the catalog addressed a variety of topics including repairs, types of current, machine drive systems (direct coupled or belt and counter shaft), and controls. With regard to repairs, Archibald Smith & Stevens reported that: "When we first commenced the manufacture of electric machines we felt very doubtful as to this question. A few years of practical working have, however, resolved the problem in an unexpected emphatic manner. The repair account is almost negligible; it has, in fact, become quite apparent that a well designed electric lift will require less repair than any other form of lift yet introduced" [3]. A survey of repair work done on their machines revealed that the annual cost to their customers was £2 19s and they claimed that: "One

machine has run for six years without repair; another has run for five years, a third for four years; four machines for three years; and eleven machines for two years" [3].

Four "types" of electric current were identified: continuous or direct, single phase alternating, two phase alternating, and three phase alternating. The perceived need to separate alternating current into three distinct types serves as reminder that the history of the electric lift encompasses the history of electric motors. Archibald Smith & Stevens noted that direct current was the type "most generally used for power purposes" in England and that alternating current had "until recently presented considerable difficulty as regards its application to lifts" [3]. They went on to say that they had "overcome these, and are supplying direct coupled, self-starting and reversing lifts on this system (single phase alternating current) with highly satisfactory results," and that two and three phase alternating current were "also perfectly suitable for lift purposes" [3].

The most interesting lift control system was their "single push button or full automatic system" [3]. This utilized one hall call button per floor, which was pressed once to summon the car. Individual floor buttons and an emergency stop button were located in the car. The catalog noted that "the natural position" for lifts that used this system was "the family mansion where every member of the household uses the lift" [3]. They also reported that: "Most of the single button systems on the market are perfectly bewildering in their labyrinth of solenoids, switches, and cables. We have, however, succeeded in working out and patenting a system which reduces the number of these adjuncts by about half, and at the same time renders the control more definite and certain" [3]. Other technical features were described with the same clear, straightforward prose. In addition to this precise prose, the catalog also contained thirteen black-and-white photographs: eleven that depicted various lift machines and two that depicted passenger machines with cars (Figs. 8 & 9).

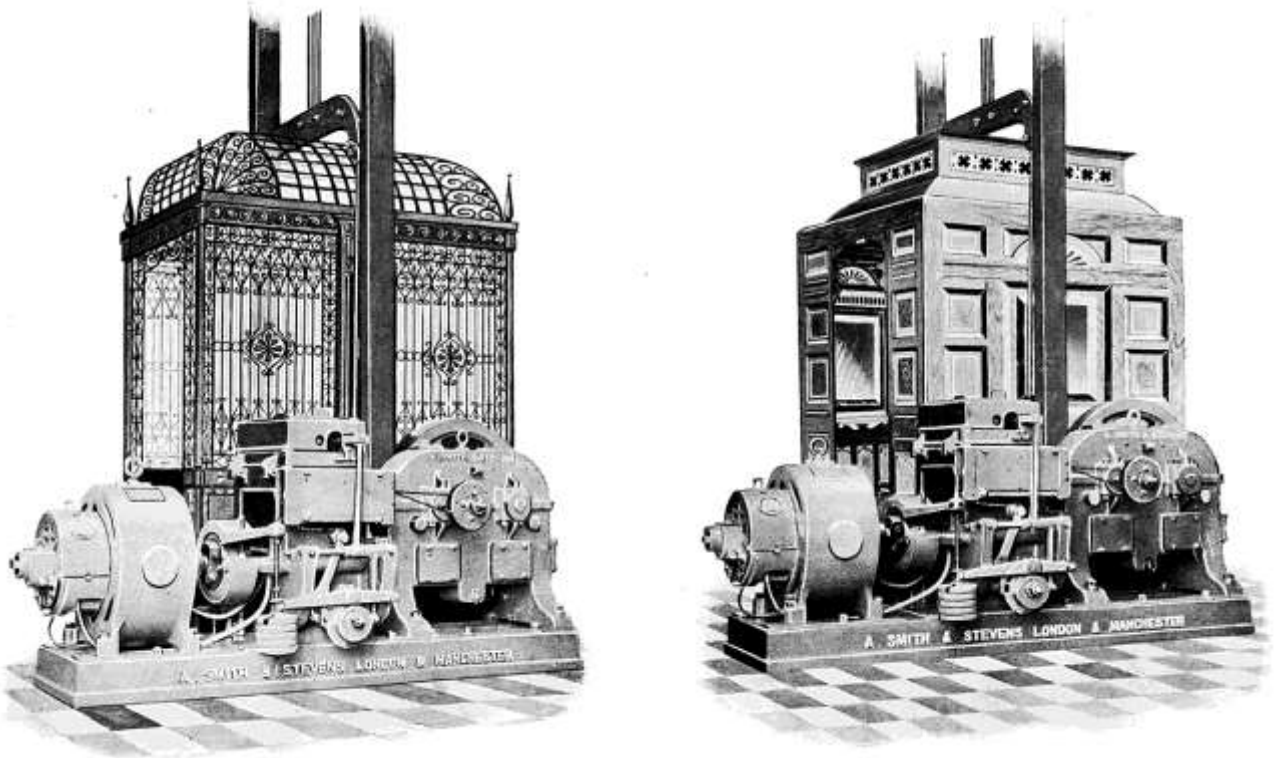
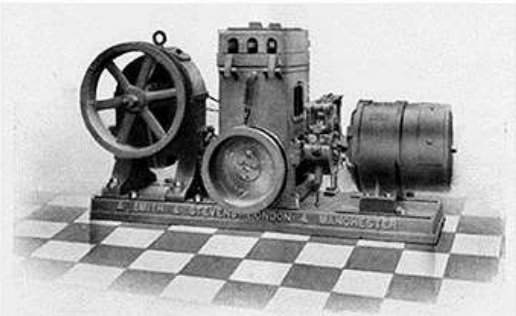
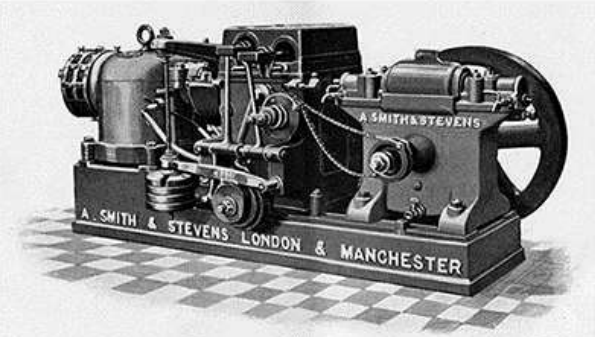


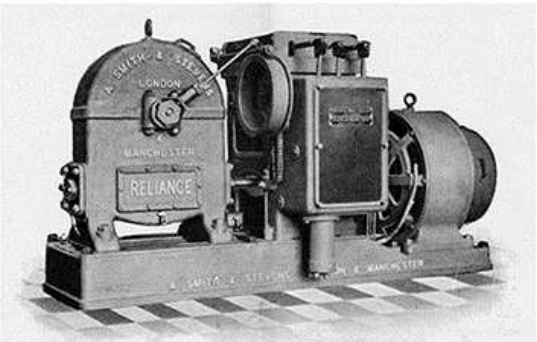
Figure 8 Archibald Smith & Stevens Lift Cars



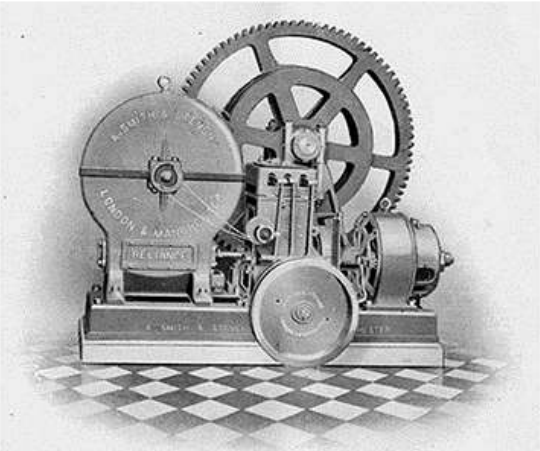
Two Phase Alternating Machine.



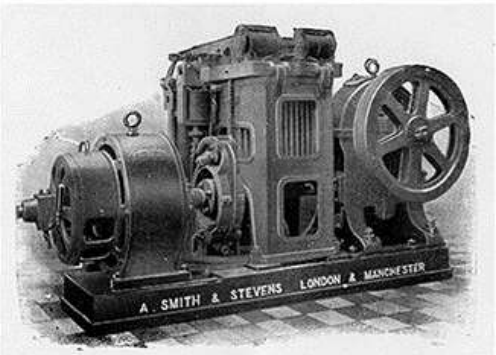
Motor and Gearing for Small Goods Lift.



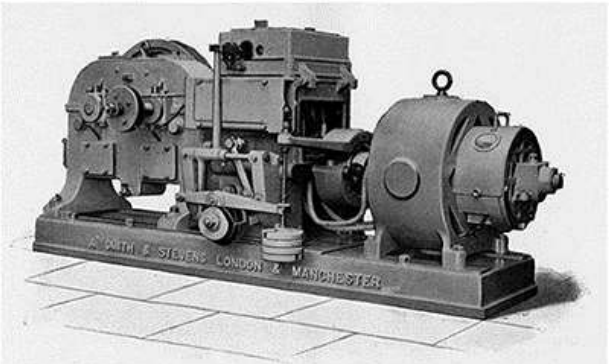
One Ton Goods Gear, 1903 Pattern.



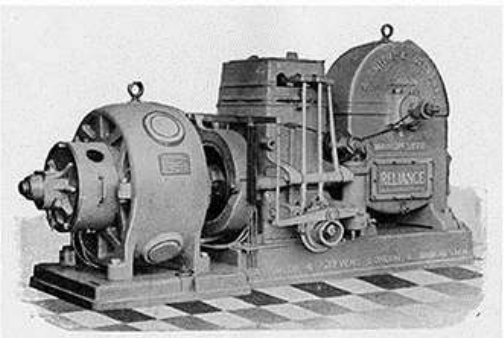
Four Ton Machine.



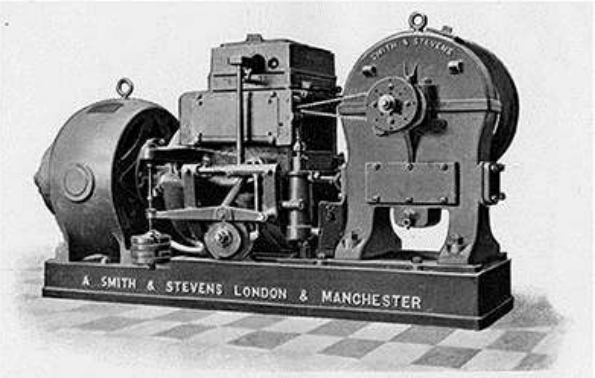
Machine controlled by Switch in Cage, 1904 pattern.



Four-Pole Motor and Balanced Gearing.



Ten cwt. Passenger Gear, 1902 Pattern.



Four-Pole Motor and Single Gearing.

Figure 9 Archibald Smith & Stevens Lift Engines

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 clearly 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 20th century for electric lift manufacturers to build the winding drum, safeties and other mechanical components and then purchase the electric motor and controller 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 rival. 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 directed at Otis, who had established the American Elevator Company in London in 1885 (which became the Otis elevator Company, Ltd. 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 1930 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 *Wadsworth's 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 accompanied by images of 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 identified as "Engineers" [4]. Other more subtle differences in the border design included different engines, gearing, and the presence of a lift car versus a lorry (Figs. 10 & 11).

Figure 10 Header and Footer Design No.1, *Wadsworth's Lifts, Transporters, Hoisters* (c. 1930).

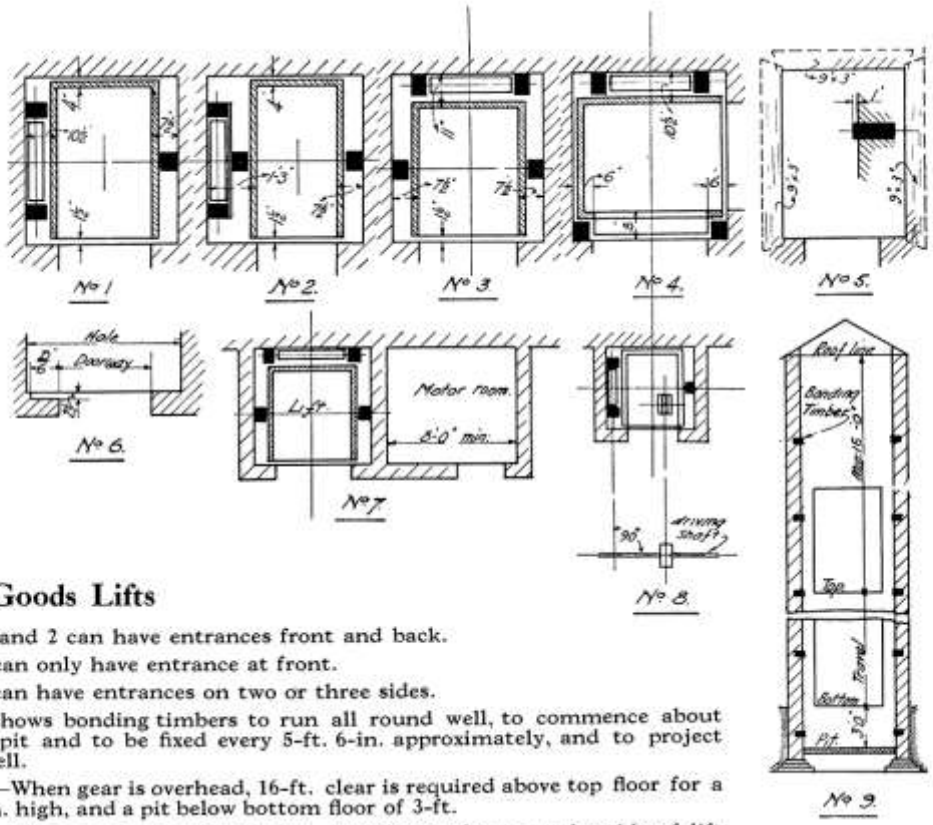
Figure 11 Header and Footer Design No.2, *Wadsworth's Lifts, Transporters, Hoisters* (c. 1930)

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 25 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 a 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 was a reminder that one of the first means of powering lifts – the belt drive – remained a common feature in British factories and warehouses. 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 machine" [4]. These lifts were also often controlled by shipper or hand ropes, the first means of lift control, which 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, 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 their 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 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 lift that was 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 manufacturing 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 identifying the information clients should submit when ordering lifts or seeking estimates. Wadsworth recommended that clients seeking estimates provide

the following: “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 (Fig. 12). The drawings 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 counterweight and 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.



Electric Goods Lifts

Nos. 1 and 2 can have entrances front and back.

No. 3 can only have entrance at front.

No. 4 can have entrances on two or three sides.

No. 5 shows bonding timbers to run all round well, to commence about 12-in. from pit and to be fixed every 5-ft. 6-in. approximately, and to project 1-in. into well.

No. 9.—When gear is overhead, 16-ft. clear is required above top floor for a car 6-ft. 6-in. high, and a pit below bottom floor of 3-ft.

No. 7.—When gear is required below, a room may be set at the side of lift on any floor, and the clear height required above top floor may now be 14-ft.

No. 6.—When required to leave a clear doorway, the collapsible gates close into a rebate, as shown. Lifting or hinged doors can also be fitted.

Electric Passenger Lifts

The runners in Passenger Lifts are steel or steel on wood backings, but the side clearances are as shown on Nos. 1, 2, and 3.

For inside size of car, allow 3 square feet area per person. Cars, 7-ft. high.

For top gear supports a strong joist will be required at each of the two sides of lift, about 10 to 12 feet above top floor.

Belt-Driven Goods Lifts

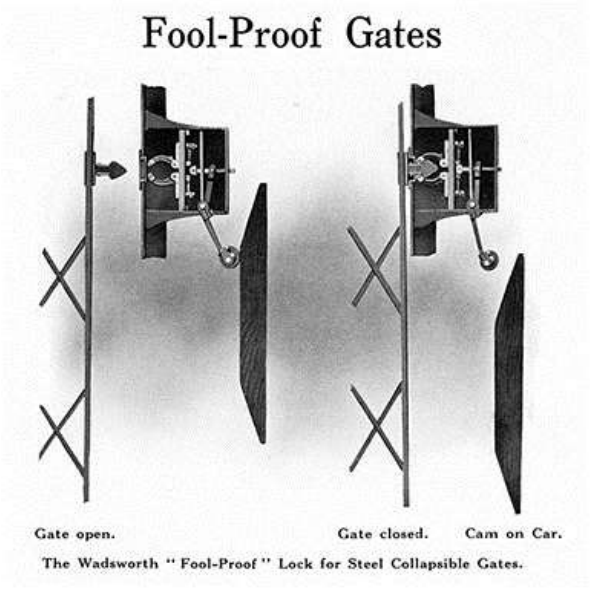
Runners arranged as Nos. 1, 2, 3, 4, and 5. The clear height above top floor will require to be 14-ft., and the depth of pit, 2-ft. The driving shaft will settle the position of the runners, and it should be at right angles to balance weight (No. 8). When gear is required below, the driving shaft will settle the position and arrangement.

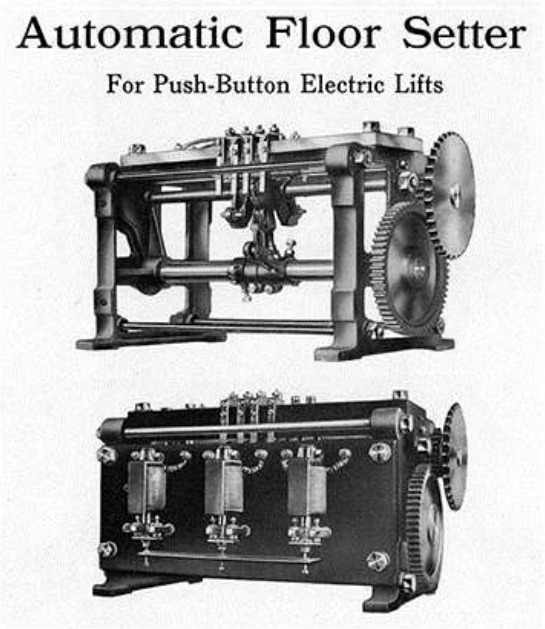
Figure 12 “How to determine size of car and dimensions of lift well”
***Wadsworth’s Lifts, Transporters, Hoisters* (c. 1930)**

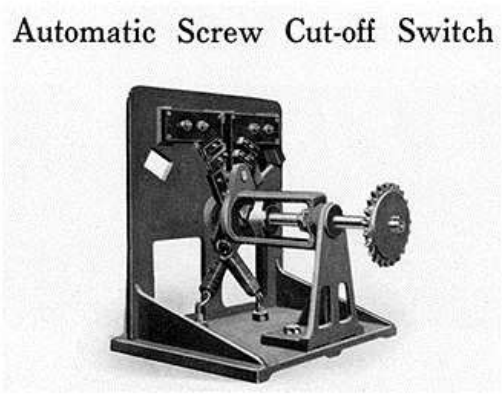
In addition to manufacturing lifts Wadsworth also provided an inspection service. The company stated that they had “inaugurated, some time ago, a system of inspection, which has made such

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]. 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 and the number of inspections per year (Wadsworth recommended that their engineers inspect lifts at least three times each year). The prospect of annually inspecting a lift three or more times may reflect – in spite of its increased commercial popularity – concerns associated with the relative newness of the electric lift and questions about its operation over long periods of time.

The catalog's 175 illustrations feature an extraordinary collection of lift machines, components, and cars. 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 include direct-connected electric passenger and goods lifts as well as belt-driven goods lifts. Although the information associated with each image varied, they provide a fascinating glimpse into the commercial and industrial settings of these lifts. Passenger lifts were depicted in hotels, infirmaries, offices, public buildings, and art galleries. 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 station. 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 20th century industrial buildings (Figs. 13-19).







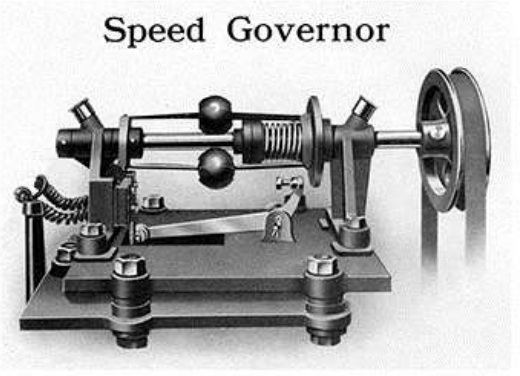
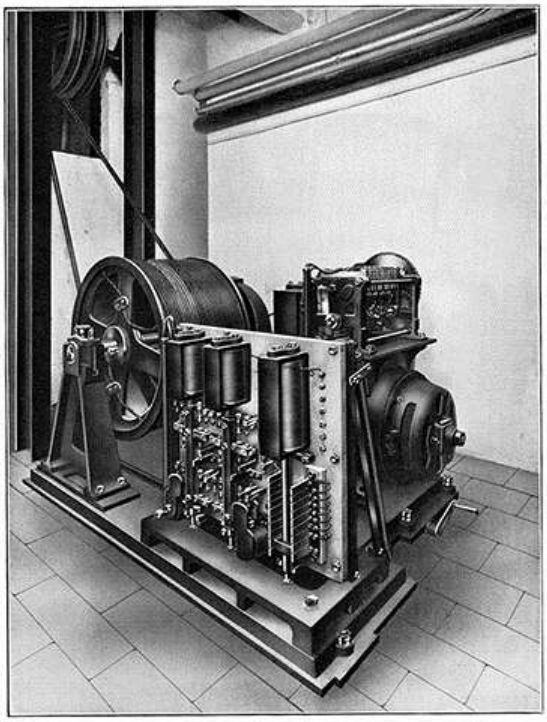
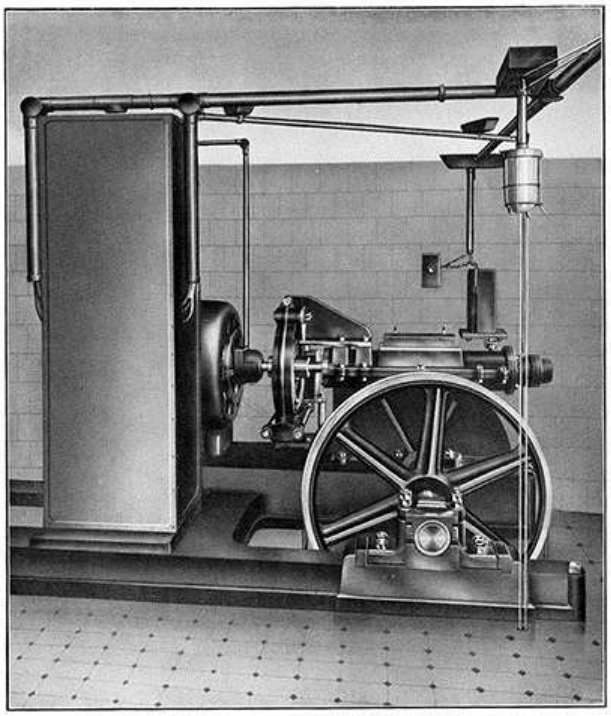


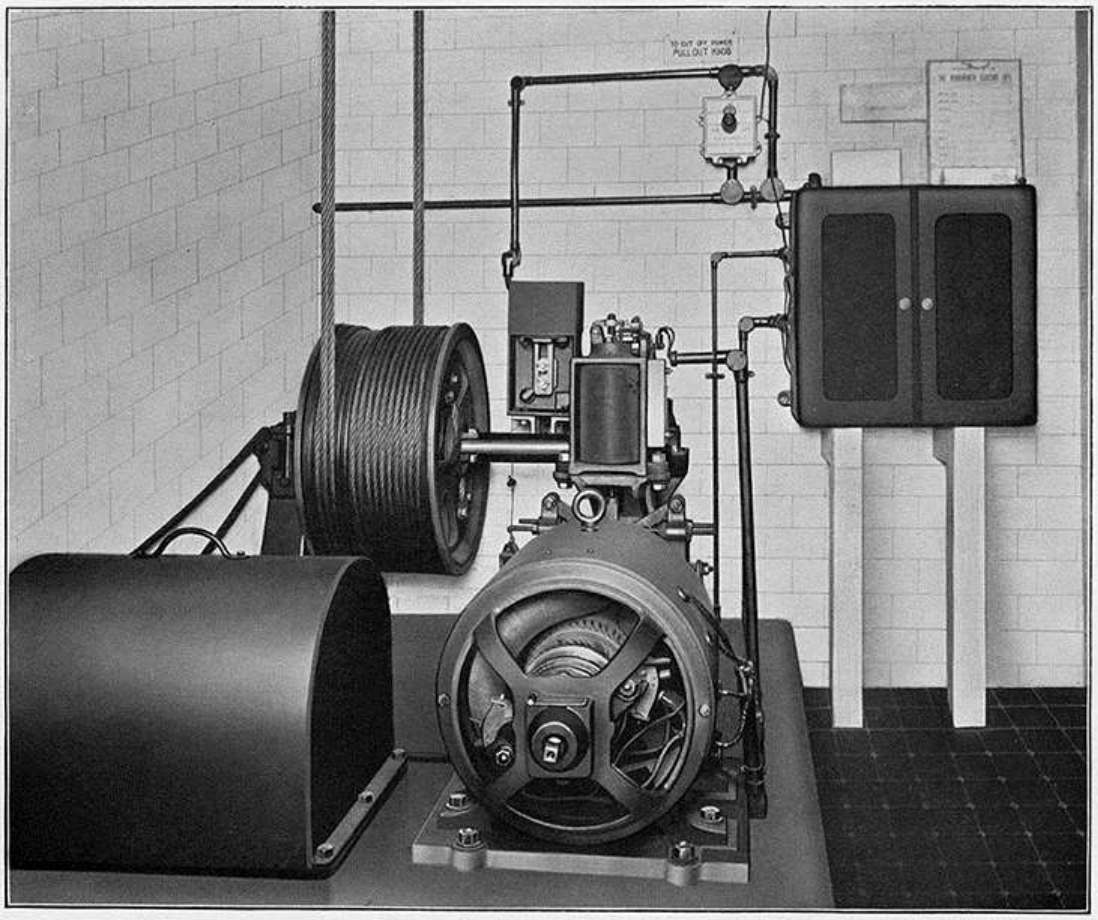
Figure 13 Lift Components, *Wadsworth's Lifts, Transporters, Hoisters* (c. 1930)



Electric Lift Winding Engine.



Winding Engine Overhead. V-Sheave Drive.



Winding Engine in basement.

Figure 14 Lift Engines, *Wadsworth's Lifts, Transporters, Hoisters* (c. 1930)

Figure 15 Lift Engine & Car, *Wadsworth's Lifts, Transporters, Hoisters* (c. 1930)

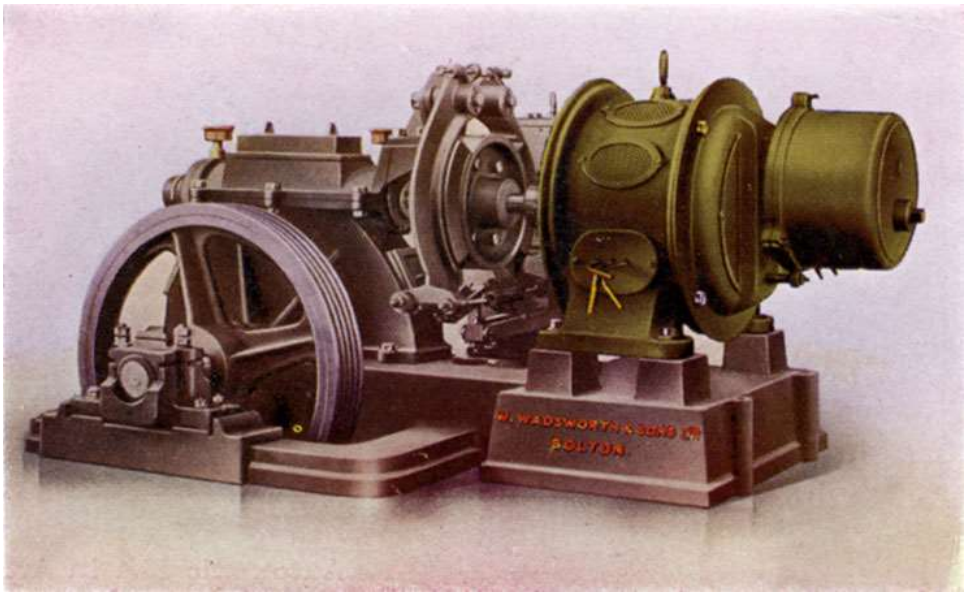


Figure 16 Lift Engine: ***Wadsworth's Lifts, Transporters, Hoisters*** **(c. 1930)**

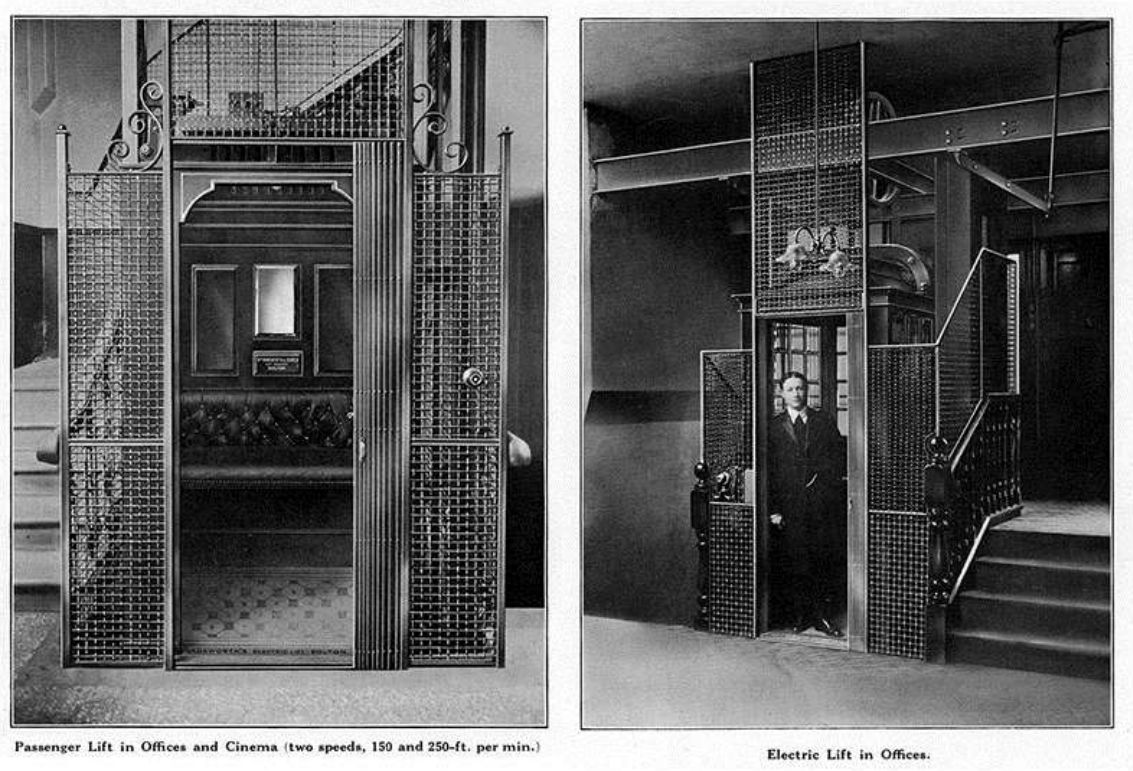
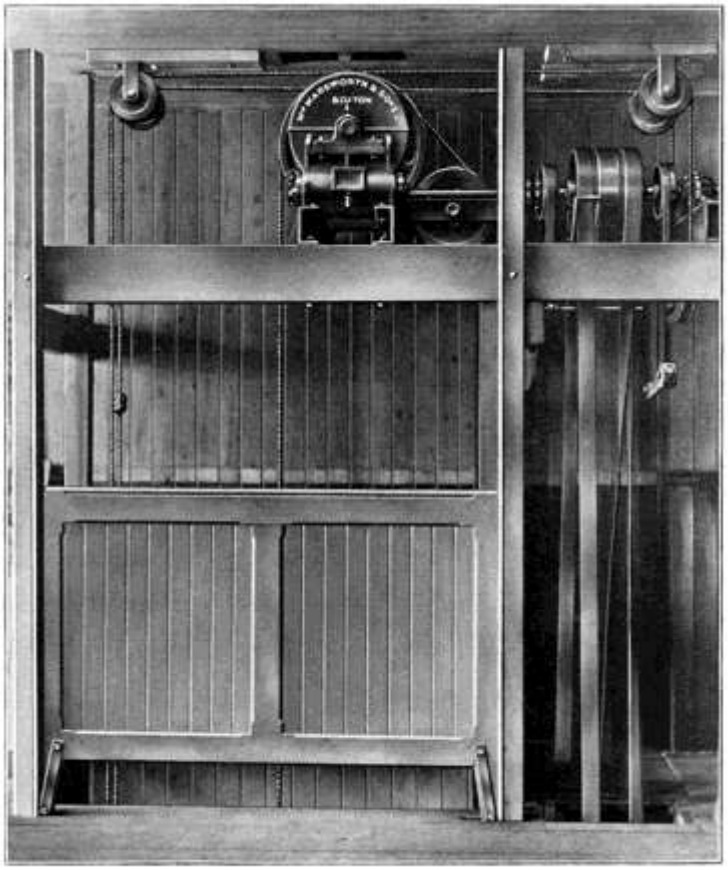


Figure 17 Lift Cars, ***Wadsworth's Lifts, Transporters, Hoisters*** **(c. 1930)**



Belt Lift in Hosiery Works.

Figure 18 Belt Driven Goods Lift, *Wadsworth's Lifts, Transporters, Hoisters* (c. 1930)

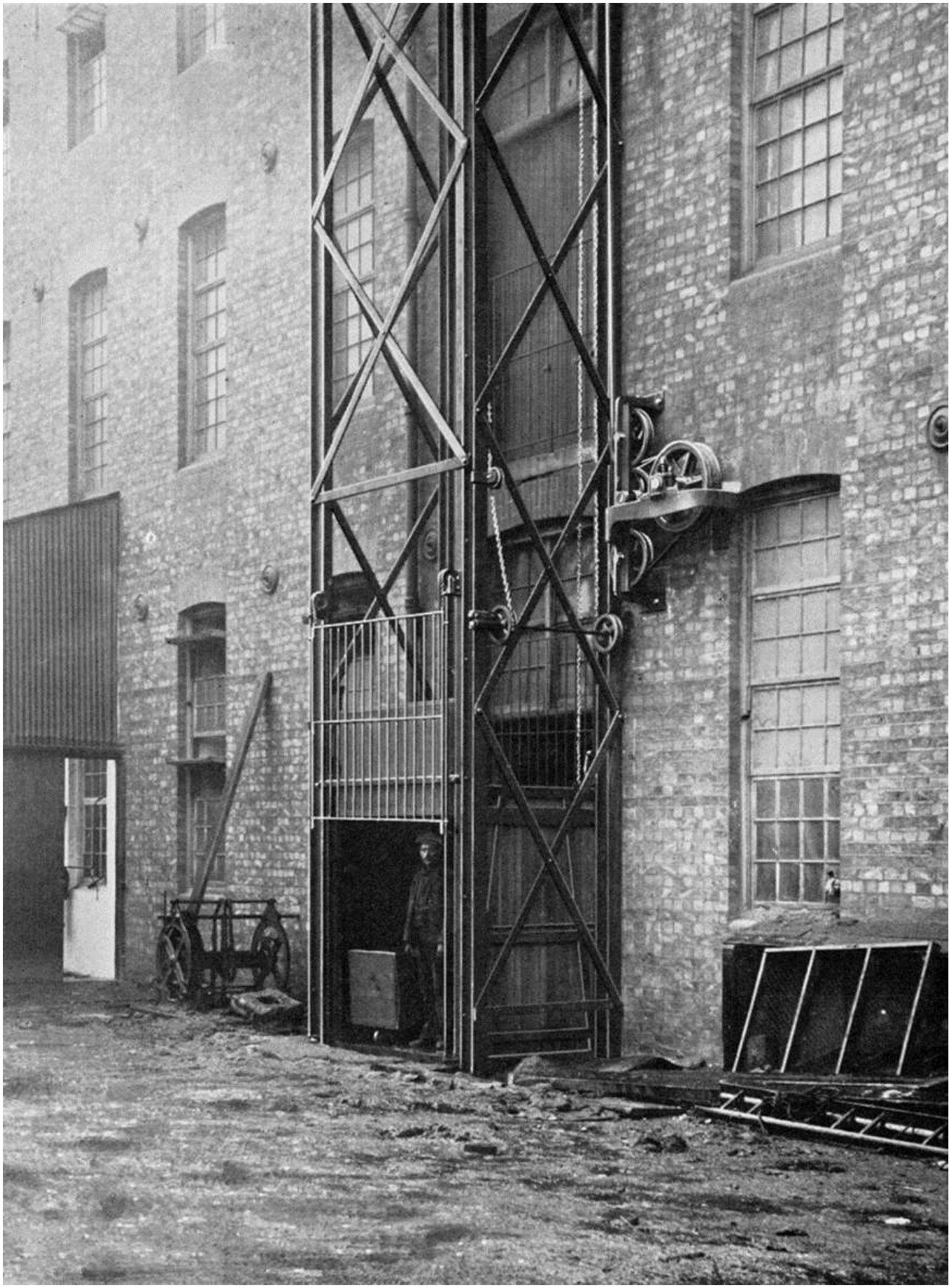


Figure 19 Belt Driven Goods Lift, *Wadsworth's Lifts, Transporters, Hoisters* (c. 1930)

6 CONCLUSION

Although the collection of catalogs examined for this paper is limited in number, their relative age, size, 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 full range of electric lift types manufactured in the early 20th century, illustrating the sustained presence of older technology alongside recent 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* (1884).

[2] R. Waygood & Co., *Hydraulic Passenger Lifts: A Guide to Intending Purchasers* (1889).

[3] Archibald Smith & Stevens, *Notes on Electric Lifts* (3rd edition) (1905).

[4] William Wadsworth and Sons, *Wadsworths: Lifts, Transporters, Hoisters* (c. 1930).

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