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United States Department of the Interior
National Park Service

National Register of Historic Places Multiple Property Documentation Form

This form is used for documenting multiple property groups relating to one or several historic contexts. See instructions in *How to Complete the Multiple Property Documentation Form* (National Register Bulletin 16B). Complete each item by entering the requested information. For additional space, use continuation sheets (Form 10-900-a). Use a typewriter, word processor, or computer, to complete all items.

XX New Submission ____ Amended Submission

A. Name of Multiple Property Listing

Ornamental Concrete Block Buildings in Colorado, 1900 to 1940

B. Associated Historic Contexts

(Name each associated historic context, identifying theme, geographical area, and chronological period for each.)

Ornamental Concrete Block Buildings in Colorado, 1900 to 1940

C. Form Prepared by

name/title Dale Heckendorn / National Register Coordinator

organization Colorado Historical Society date April 4, 1996

street & number 1300 Broadway telephone 303-866-4681

city or town Denver state CO zip code 80203

D. Certification

As the designated authority under the National Historic Preservation Act of 1966, I hereby certify that this documentation form meets the National Register documentation standards and sets forth requirements for listing of related properties consistent with the National Register criteria. This submission meets the procedural and professional requirements set forth in 36 CFR Part 60 and the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation. (See continuation sheet for additional comments [ ].)

James Hartman State Historic Preservation Officer September 21, 1997
Signature and title of certifying official Date

State Historic Preservation Office, Colorado Historical Society
State or Federal agency and bureau

I hereby certify that this multiple property documentation form has been approved by the National Register as a basis for evaluating related properties for listing in the National Register.

Beth Boland
Signature of the Keeper Date of Action

Table of Contents for Written Narrative

Provide the following information on continuation sheets. Cite the letter and the title before each section of the narrative. Assign page numbers according to the instructions for continuation sheet in *How to Complete the Multiple Property Documentation Form* (National Register Bulletin 16B). Fill in page numbers for each section in the space below.

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Primary location of additional data:

[X] State Historic Preservation Office
[ ] Other State Agency
[ ] Federal Agency
[ ] Local Government
[ ] University
[ ] Other

Name of repository:

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Paperwork Reduction Act Statement: This information is being collected for applications to the National Register of Historic Places to nominate properties for listing or determine eligibility for listing, to list properties, and to amend existing listings. Response to this request is required to obtain a benefit in accordance with the National Historic Preservation Act, as amended (16 U.S.C. 470 *et seq.*).

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STATEMENT OF HISTORIC CONTEXTS

ORNAMENTAL CONCRETE BLOCK BUILDINGS IN COLORADO, 1900 TO 1940

DEVELOPMENTS IN CONCRETE CONSTRUCTION

Concrete is a versatile construction material, favored by builders for centuries due to its ready availability, simplicity, and its durability. Concrete consists of varying combinations of sand, gravel, crushed stone, or other course material, bound together with various kinds of cementitious materials, such as lime or cement. With the addition of water, the mixture undergoes a chemical reaction and hardens.

Concrete was first used by the Romans in the construction of bridges and aqueducts. Builders in Spain and Africa kept the technology alive during the Middle Ages. The Spanish introduced a form of concrete to the New World in the first decades of the 16th century. Spanish and English settlers used the product along the coast of America from Florida to South Carolina. They poured the liquid material into forms for walls rising in layers of about a foot per application.

Orson S. Fowler advocated the use of "gravel wall" construction, another name for concrete aggregate, in his 1853 book, *A Home for All*. This type of building construction appeared across the U.S. The military used the "lime-grout" construction technique to improve many of its frontier post, including Fort Laramie in Wyoming.

A significant improvement to concrete construction came in 1860 when S.T. Fowler obtained a patent for a reinforced concrete wall. The inclusion of metal rods within the concrete provided the material with greater stability and load bearing capabilities.

As the technology for the use of concrete evolved, the production of cement also underwent improvements. Between 1900 and 1903 several dramatic new improvements in the grinding and firing techniques for Portland cement resulted in reduced costs and a standardized, reliable product. The invention of the horizontal rotary kiln was one such industry innovation.

DEVELOPMENT OF CONCRETE BLOCK

As poured forms of concrete were gaining popular and professional acceptance in the late 19th and early 20th centuries, experimentation occurred with the production and use of concrete building blocks. Builders explored the possibility of forming concrete into block for masonry applications.

In its current form concrete block is produced from a mixture of Portland cement and aggregates. The blocks are commonly manufactured in 8x8x16-inch size and may be solid or hollow (typically with two or three cores), and the block ends may be flat or flanged. Modern day forms of the blocks are most often called concrete masonry units. Block weights vary depending on the type of aggregate materials used. Most concrete blocks manufactured today have a core area of 40 to 50 percent and are defined as hollow. The blocks' configuration determines two key characteristics: compressive strength and fire residence.

It must be noted here that the term "concrete block" is largely a modern construct. Manufacturers, builders, and building owners referred to the blocks by a number of names, including: cement block; cement building block; concrete block ; patented stone; artificial stone; pressed stone;

and cement stone. The *Colorado Business Directories*, published in Denver by the Gazetteer Publishing Co., consistently used the topical heading, "Cement Building Block Manufacturers"

To grammarians and architectural purists, the term cement block is abhorrent. Cement is the dry powder bonding agent which when mixed with sand, gravel and water forms concrete. A cement block would truly be an ephemeral, fair weather entity. Despite the contemporary use of the term cement block, concrete block more clearly reflects the properties of the material, Within the general category of concrete block are three major divisions: ornamental concrete block, the focus of this study; cinder block, a near relative; and concrete masonry units, successor to the ornamental block.

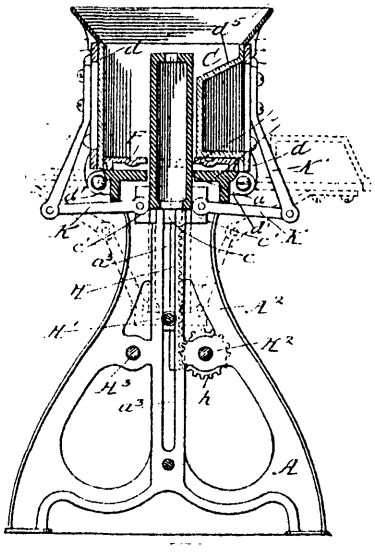
Throughout the nineteenth-century attempts had been made to cast concrete into building blocks. The first successful concrete blocks may be credited to Ambrose Foster of Portland, Wisconsin. He patented a hollow core block in 1855 which was composed of lime and sand that had been pressed and cured. He used his knowledge of grout, or concrete, houses to develop a mortar that would harden into a stone-like material. Different types of sands gave the Foster Block a variety of shades and metal oxides could be added to create even more colors. In 1856 Foster and his brother George patented America's first machine for molding and pressing building blocks. The first machines were not overly reliable and the quality of the finished houses was inconsistent due to variations mixing materials and pressing blocks. Reasonable successful Foster Block houses were built in Wisconsin, Iowa, Ohio, New York and Massachusetts.

Although Foster's patent discuses the hollow core only in terms of speeding the curing process by creating greater exposed surface area, it soon became apparent that the hollow core created an air chamber in the wall which kept moisture for affecting the interior surfaces. The core, originally only an improvement in the manufacturing process, was eventually recognized as contributing to improved use.

Foster met with only limited financial success and his company soon disappeared. His patents were acquired by George E. Vanderburgh, president of the American Building Block in New York City. American Building Block improved on Foster's Block and widely distributed them across the U.S. and Canada. By 1868 numerous entrepreneurs entered the market and patents for blocks with improved appearance and durability were filed.

The mass production of hallow concrete blocks began at the dawn of the twentieth-century. The modern concrete block industry began in 1899 when Harmon S. Palmer patented his invention of a cast iron block machine. The first phase of the industry, roughly 1900 to 1920, was characterized by the Palmer-type hand-operated metal machines that made single blocks. Palmer founded the Hallow Building Block Company in 1902 to manufacture his machines. Within two years the company was producing about 400 machines a year and selling them for $200 each. Competitors soon flooded the market with similar machines. Palmer advertised a $5.00 reward to anyone who would help find and prosecute patent violators. He launched a series of successful lawsuits to protect his patent but new machines continued to proliferate.

Figure 1



Palmer Block Machine from Patent Application

Concrete blocks grew to be extremely popular in the first two decades of the century. The growing availability of improved and reliable Portland cement spurred production. The larger size of each block compared to brick reduced the time and labor costs involved in laying a masonry wall. At approximately 15 - 25 cents each they were an attractive alternative to brick and wood. Cement, sand and gravel were widely available while wood at the turn of the century was characterized by falling supplies and rising prices. Concrete blocks needed little repair and were fireproof, a definite plus for banks and early automobile garages. The concrete block industry itself rapidly developed as new machines, mixtures, and curing methods developed to improve the product.

The new blocks were also more attractive then the flat, undecorated blocks first developed by Foster a half-century earlier. Wreaths, scrolls, or cobblestone faces could easily be formed by changing the face plate in the block machines. The most popular surface treatment was rockface and the pattern was standard with most machines sold. The term "artificial stone" came to be attached to concrete block both due to the strength of the material and because of the prevalence of the rockfaced pattern.

The 1900 to 1940 period is characterized by the rise and eventual decline of what may be called ornamental concrete blocks. The block was created with decorative surface designs to be used in visible exterior applications. It is the particular use of concrete block which differentiates the period from previous and later period in the development and use of concrete block.

Debate in the building trade press during the 1910s and 1920s centered around the durability of the product, particularly when concrete blocks contained decorative ornamental faces. Many in the architectural profession expressed condemnation of the product. Architect Oswald Harding wrote a book on concrete houses in 1912 and reported that "the sight or mention of concrete block in its present crude form, especially in imitation of 'cut' or 'rockfaced' stone, has been sufficient to band the architectural profession together as a unit in protest and condemnation." Some architects, he continued, labeled the blocks as a "cheap and vulgar imitation of stone...never acceptable in any work of worth."[1]

The American Institute of Architects created a special committee in 1907 to study concrete and its uses. They concluded that while reinforced concrete had much to recommend it, concrete block did not and should be avoided.

Even Frank Lloyd Wright who experimented with a personal version of concrete block construction in California in 1920 declared, "There was never a more inferior building material than the old concrete block...The block was cheap imitation and abominable as material when not down-right vicious. Every form it undertook soon relegated it to the backyard of aesthetic oblivion."[2]

COMMERCIAL BLOCK PRODUCTION

In the face of animosity from many in the architectural profession and with the promise of a vast potential market of builders and property owners, the concrete block industry began to organize and promote itself. The Concrete Block Machine Manufactures Association was founded in 1905, the Concrete Block Producers Association in 1918, and the Concrete Block Manufactures Association in

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[1] Pamela H. Simpson. "Blocks Like Rock," *Building Renovation*, Spring, 1995, p. 51.

[2] Simpson, p. 51.

1919. The 1920-1940 period was characterized by a decline in the number of small block producers but an increase in total industry output as modern production methods created economies of scale for large producers.

One accomplishment of the association movement was the standardization of block sizes. Prior to 1924 sizes varied between manufacturers and some concrete blocks measured 12x9x32 inches and weighed 180 lbs. They required the use of a hoist to lift them into place. By 1930 the 8x8x16-inch unit was the industry norm. The associations also spurred the increased use of testing to improve the blocks' reliability and durability.

The concrete block trade organizations promoted the use of their products through trade magazines, catalogues, and books aimed at the home-building public. Such publications as *Plans for Concrete Houses and Concrete Garages: The Fireproof Home for the Automobile* appeared in the 1920s. Industry production levels reflected the success of these campaigns. In 1919, 50 million concrete blocks were produced in the United States; in 1928 that number had increased to 387 million. A brief downturn during the Great Depression was followed by an upsurge during World War II. Although by 1951 some 1.6 billion blocks were being produced in the United States, the number of manufacturing firms steadily decreased. The number of plants dropped from 7,000 in 1920, to 4,140 in 1928.

A major change in the industry came with the introduction of lightweight aggregates that reduced the weight on the blocks. In 1917 F.J. Straub patented a product he called cinder block and in 1919 he established a manufacturing plant in Lancaster, Pennsylvania. Its first year's production amounted to a modest 25,000 cinder blocks, but by 1926 the annual output reached 70 million. Straub promoted his cinder blocks as a structural material, affordable and lightweight, suitable to receive more traditional facing materials such as brick. Cinder blocks were strong, could be nailed into, and were easy to lay.

During the 1930s and especially in the 1940s many other lightweight aggregates were introduced. Some, like pumice, were naturally occurring. Others, like cinders and slag, were industrial by products. Still others, like expanded shale, clay and slate, were manufactured specifically as aggregates. Expanded shale, clay and slate aggregates, which proved particularly popular, are made by a process of rigid firing that bloats the new material with expanded gases. The material is then quickly cooled to retain a cellular structure. Haydite, one of the earliest expanded shale products, was patented in 1919 and first used for block in 1923. Pottasc (late called Celocrete), a blast furnace slag treated with water, was introduced around 1930. In the late 1930s Waylite, a slag expanded with steam, was introduced.

Whatever the name or composition, the new lightweight blocks cut significantly into the market for the heavier, ornamental concrete block. Production and use steadily switched from the older to the newer block forms until by 1940 the ornamental concrete block had been replaced by the plain concrete masonry units in use today.

MANUFACTURING PROCESS

Most early twentieth-century block machines consisted of a metal frame and mold box with a hand-release lever that allowed for removal of the sides and cores. The two main types of machines were downface and sideface, named according to the location of the face plate. The hollow cores were oriented either vertically or horizontally depending on the location of the face plate.

The downface orientation seemed to be the most desirable. The 1912 Sears, Roebuck and Co. catalogue noted in its advertisement for a downface machine that "this method permits the use of a fine waterproof material for facing and a coarser material for the backing of the block. In addition, when tamping facedown, the material is forced into the face plate depressions, which brings out all the beauty of the design."[3]

The 1906 Montgomery Ward catalogue provided a basic receipt for concrete block. They advised to begin with one part cement to 5 or 6 parts sand or gravel.

> Mix the dry material thoroughly, then wet and mix again; do not make the mixture too wet, but just wet enough to pack and tamp well. Take the block out of machine, but do not remove from the pallet for at least 24 hours. Let blocks stand 8 to 12 hours, then wet thoroughly twice a day for four or five days. The stone is then "cured" and ready for the wall.[4]

Reports of the production rates for block machines varied widely. Some sources indicate that two men working together could produce 80 to 100 blocks a day, while many manufacturers claimed one man could make 300 blocks in a day. With the typical 10-hour work day of the period, 300 per day equates to 1 block every 2 minutes. Sears claimed in 1911 that one man could produce 125 blocks a day on its Wizard machine and that two men could achieve a rate of 250 to 300 per day. Testimonial letters published in Sears 1911 catalogue claimed even higher rates of production. A man from Downing, Missouri, writing in praise if his Triumph Block Machine stated, "I can turn out 200 blocks in ten hours. I have run thirty-one in a single hour."[5] In a letter about his Wizard brand machine, Wm. Roberts of San Antonio attested that "my men can make 35 blocks an hour."[6] An other block manufacturer from Medina, Ohio, claimed his molder could make a block in a Wizard in only 56 seconds. He did not say how long his employee could sustain this frantic pace.

An alternative way of making the blocks was the slush method, which used the Zagelmeyer cast stone block machine. A wet mix was poured into metal molds that sat on open rail cars, which were subsequently rolled into curing sheds. Each car could hold up to 20 molds, but the blocks had to dry in the mold before they could be released and the molds reused.

In the 1920s power tamping and stripper machines replaced the earlier hand-tamped, downface forms. The stripper had rigid sides that extruded the blocks from molds rather than releasing them through moveable sides. Most of the process, including the tamping, was automated. Two major

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[3] Sears, Roebuck and Company Catalogue No. 124 (Chicago: Sears, Roebuck & Co., 1912) p. 1161.

[4] Montgomery Ward and Company Catalogue No. 75. (Chicago: Montgomery Wards & Co., 1906) p. 411.

[5] Sears, Roebuck and Company Catalogue No.122. (Chicago: Sears, Roebuck & Co., 1911) p. 1174.

[6] Sears No.122, p. 1176.

changes in the 1930s were the introduction of automatic vibrators, which replaced tamping, and machines that could make multiple blocks.

In 1934 Louis Gelbman and the Stearns Manufacturing Company of Adrian, Michigan, developed the Joltcrete machine, which made three standard blocks simultaneously and nine blocks a minute. The vibrating machines also gave impetus to the use of lightweight aggregates because they could handle the mixture better than the tamp-type machines. By 1940 most aspects of making blocks, from mixing to curing, had been automated as well. The use of steam, first suggested in 1908 as a way to cure blocks, quickly became standard in the 1930s.

Uses and Methods of Installation

The production of single concrete blocks with simple materials in a relatively inexpensive and easy to use machine lead to a backyard industry of independent contractors and private home owners. Many independent contractors expanded into small but profitable local enterprises. At the same time many small town and rural families made concrete blocks to form the walls of their own homes and outbuildings. Much as the earlier settler felled trees for a mountain log cabin, shaped mud to form adobe bricks, or cut sod for the prairie homestead, the twentieth-century settlers of many towns and rural areas mixed cement, gravel, water and pressed the hundreds of individual blocks needed to form a snug house, a sturdy barn, or fireproof garage. Concrete block drew from the use of native materials and simple manufacturing techniques perfected by adobe brick makers and by adding the structural strength created a building block with the durability of brick and stone.

The advantages claimed for hollow concrete blocks were that they were inexpensive and that they could be installed faster than traditional materials, such as brick. They were also fireproof, needed little care, and could be produced in a variety of ornamental patterns.

Of the concrete blocks manufactured before 1915, nearly 75 percent were used for foundation and basement walls or as partition walls. While the foundation blocks were often rockfaced, the partition walls, which were later covered, were always plainface block. Plainface blocks covered with stucco were also popular for exterior walls.

Concrete block is a durable construction material when properly manufactured, installed, and maintained. Like other concrete products, concrete blocks shrink as they cure and change when exposed to thermal and moisture changes. Cracking is usually related to shrinkage of the concrete or movement of the blocks and the wall. The common forms of deterioration include spalling and efflorescence. Spalling may be caused by problems in the block mix, water infiltration, or mechanical damage. Efflorescence is the accumulation of salts on the surface, generally carried through the masonry by the movement of water. Staining and dirt accumulation can also occur on concrete blocks.

While many ornamental concrete block buildings retain a near original appearance, alterations are also common. Changes may include simple painting to more significant changes including stuccoing and covering with other materials such as brick, stone, and wood or vinyl siding.

Marketing Ornamental Concrete Block

The marketing of concrete block machines through mail-order catalogues did more than anything to spur the non-commercial manufacture and use of concrete block. Machine makers and catalogue retailers recognized that three primary markets existed for block-making machines: do-it-

yourselfers like farmers and budget-minded town dwellers; small-scale contractor-developers; and those already in related businesses (building-supply retailers, lumberyards, cement manufacturers).

Sears, Roebuck and Co. first began to advertise the block machines in 1905. The mail-order master minds at Sears realized that ultimate success lay not in promoting the block machines themselves but rather in promoting their secondary output -- snug homes and business opportunities. Sears catalogues trumpeted the superiority of concrete block as a building material and the lucrative profit potential awaiting industrious entrepreneurs in commercial block production. The 1907 Sears catalogue devoted seven full pages to concrete block machines and accessories. The entire first page was devoted to extolling the virtues of the building material and the business opportunity it represented, with the later receiving the greater emphasis.

> **ANYONE ANYWHERE CAN MAKE MONEY** [emphasis in original] by engaging in this new and attractive business as the demand exists and is increasing and it is simply a question of supplying it with a cement block and cement brick of good quality. Many farmers and mechanics who own or have access to a sand bank or gravel pit are now manufacturing cement building blocks and find a ready market at a handsome profit...As in any other line of business, those who grasp the opportunity first will make the most money out of the business; those who start early and establish a reputation for making good blocks will build up trade that will yield them handsome profits for years to come, as the business is now only in its infancy.[7]

Just a little practice, the Sears copywriter proclaimed, and anyone could produce a strictly first class block. Just a little money invested in a block machine would allow a laborer to double or triple his income.

> In fact, we do not know of a single line of business anywhere yielding the profits which the manufacture of cement block and cement brick will yield in any community that may be undertaken with as little capital as that required to establish a cement block or cement brick making business.[8]

The catalogue copy noted that 5 cents worth of ingredients yielded a block which retailed for 15 to 25 cents and that the necessary materials could be found in practically every community in the nation. Overhead needs were minimal, both economic and environmental. "Rainy days do not mean a loss of income to the man who owns a cement block machine; he goes right on working and piling up the blocks because the cheapest sort of a shed or a tent will serve to protect him and the newly moulded [sic] blocks from damage."[9]

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[7] Sears, Roebuck and Company Catalogue No.117. (Chicago: Sears, Roebuck & Co., 1907) p. 424.

[8] Sears No. 117, p. 424.

[9] Sears No. 117, p. 424.

Figure 2

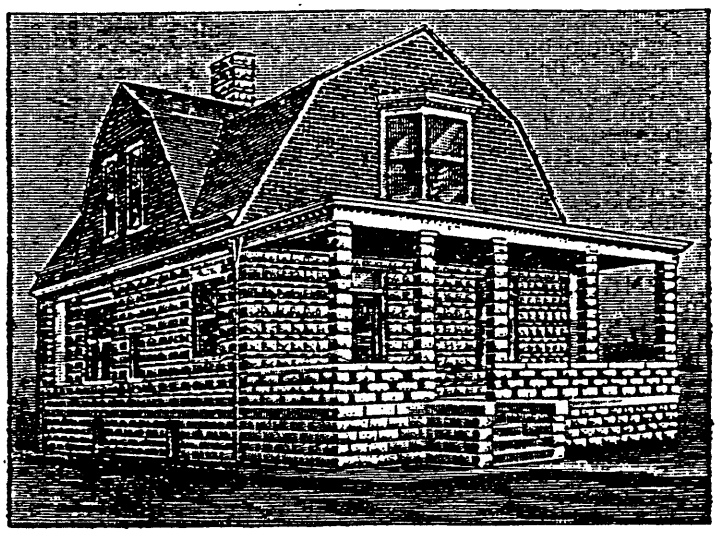


Illustration from the 1907 Sears Catalogue

Sears cited various reasons for considering concrete block as a construction material, including: cheaper labor costs than brick construction; blocks improve in strength and hardness with age; ease in constructing a highly ornamented masonry structure; fireproof material for safety and reduced insurance premiums; and the hollow block air chambers make buildings frostproof, moisture proof, warm in winter, and cool in summer. To further entice buyers, Sears provided illustrations of four concrete block houses and one small commercial storefront to illustrate the attractiveness and versatility of concrete block construction.

The 1907 catalogue included seven different models of block makers ranging in price from $24.45 to $46.35. Most machines could be purchased to create one of three sizes of block: 8x8x16-inch; 8x10x16-inch; or 8x12x16-inch. One special machine was offered capable of producing 8x12x24-inch blocks. Each machine came with two face plates for creating the decorative external face. The plain face and rock face plates came as standard, but purchasers could request as a replacement any of the various styles illustrated. Additional styles included panel face; tooled face; tooled edge rock face; cobblestone face; 4 designs of broken ashlar; and pressed brick face. The machines came equipped to make full blocks as well as half and quarter blocks. Specialty plates could be purchased to make blocks with rope face or scroll face, and special water table and gable end blocks could also be produced. A bay widow attachment was available to create the necessary 45 degree angled block. Specialty molds were also available to create porch, chimney and columns castings. Porch columns could be made of square blocks or round columns and accessory pieces could be added to create fluting, rings, and simple capitals and bases. A separate machine was available to create 48-inch long sills and lintels.

In addition to the extensive coverage given to concrete block and machines in the basic Sears catalogue, the company offered a separate 160 page catalogue devoted entirely to cement block and brick machines and concrete mixers. The specialty catalogue thoroughly discussed block making and showed pictures of various concrete block buildings and structures. This is one year before Sears began its successful kit-house sales program.

Finally, the 1907 Sears catalogue observed that concrete blocks could be used in secondary roles in both new and old construction. "There is a vast field for the use of cement blocks in foundations alone and still another field in the building of porches in remodeling old houses. A few dollars spent expended in adding a large, spacious, handsome cement block porch to an old residence will add hundreds of dollars to the value of the building."[10]

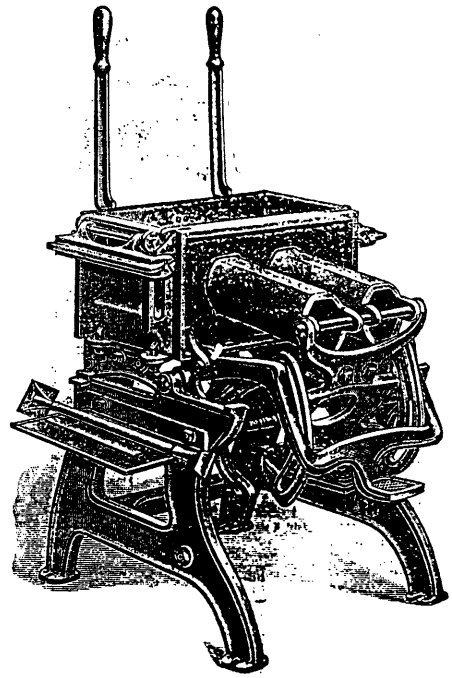
[10] Sears No. 117, p. 424.

Montgomery Ward began to offer concrete block machines in their catalogues at the same time as Sears. They too pointed out the commercial opportunities in concrete block manufacture. "A Cement Building Block Machine is now considered one of the best and most profitable investments to be found...With a good block machine and Portland cement and sand, any farmer can make all the stone he requires for his own use and sell some to his neighbors."[11] Wards only offered two types of machines in three block sizes each. Prices ranged from $21.75 to $40.00.

In 1911 Sears continued to emphasis the commercial aspects of concrete blocks in its standard catalogue. A headline across the first two of six pages of advertising proclaimed that an investment of $58.95 started the reader out in business making concrete block. The copy went on to elaborate:

> $58.95 starts you in this profitable business with a positive assurance of success. No matter what your present occupation is, whether mechanic, laborer, farmer, merchant, or professional man, you can make good profits right from the start. It is not even necessary to take an active part in the business yourself. You can hire reliable and competent men, or if you have a son or dependable relative, you can give him the management of the business and you can attend to your regular work, merely overseeing the affairs of the concrete business.[12]

Figure 3



Sears Wizard Block Machine

The complete kit included the Triumph Block Machine with standard face plates, molds for fluted columns, column rings, and square piers, a chimney mold, and the Badger Adjustable Sill and Cap Machine. Also advertised was the Wizard Machine, an improved design which produced block faster than other available machines. Reports of the exact production rates for block machines varied widely, but Sears claimed that one man could produce 125 blocks a day on the Wizard.

The block machines and accessories advertised by Sears, Wards, and other catalogue firms helped create acceptance of and demand for concrete building blocks. The prevalence of mail-order house plans and catalogue kit-houses in the first three decades of the 20th century also stimulated the acceptance and use of concrete block across the country.

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[11] Montgomery Ward and Company Catalogue No. 75. (Chicago: Montgomery Wards & Co., 1906) p. 411.

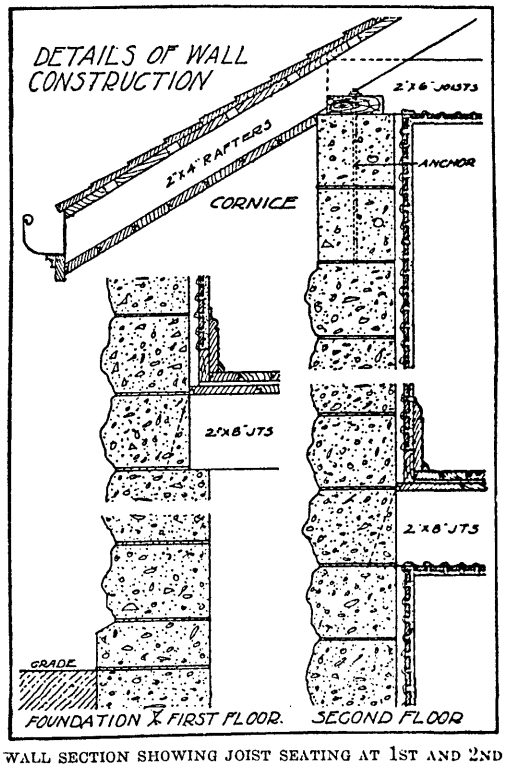
[12] Sears, Roebuck and Company Catalogue No.122. (Chicago: Sears, Roebuck & Co., 1911) p. 1174.

Precut or prefab house catalogues represent the fourth in an evolving series of architectural plan books used in America. The first type, the carpenter's handbook, provided plans and information on basic construction techniques to carpenters and other builders. These first came into use in America around 1790. The second type of plan book was the style or pattern book which attempted to define "good taste" for unschooled builders and home owners. Pattern books made their appearance about the close of the Civil War.

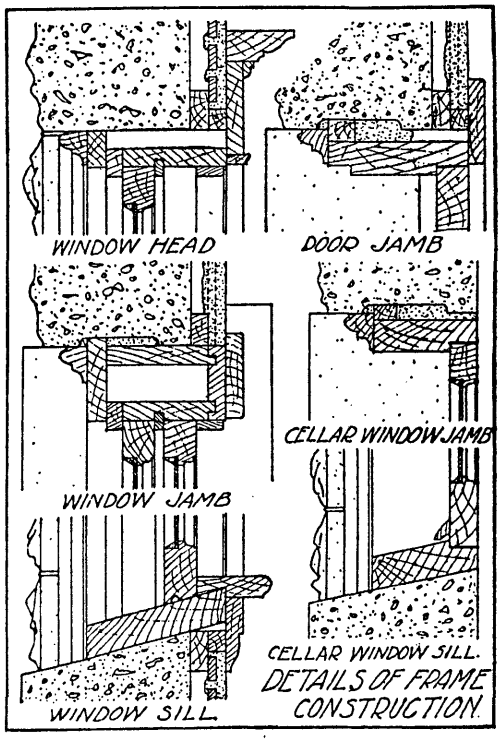
Building plan books, through which one could order a complete set of working drawings and materials list, constitute the third category. They also appeared after the Civil War. They were extremely popular during the last half of the 19th century and remain in use today.

One of the most prolific producers of plan books and related publications was the Radford Architectural Company of Chicago. In 1909 the firm issued *Cement Houses and How to Build Them: perspective views and floor plans of concrete-block and cement-plaster houses.* While the book included many poured concrete and stucco designs, it also contained many concrete block designs for urban or rural construction.

Figure 4



WALL SECTION SHOWING JOIST SEATING AT 1ST AND 2ND FLOORS AND PLATE.



WINDOWS AND DOOR FRAMING DETAILS.

PLATE 36—CONCRETE BLOCK CONSTRUCTION

Complete details of all wood framing occurring in connection with block work, both ordinary block construction and block veneer.

Radford's *Measured and Scaled Detail Drawings for Builders and Carpenters*

Cement companies published books on concrete construction. The Atlas Portland Cement Company of New York published such volumes as *Concrete Houses and Cottages* in 2 volumes (1909), *Building a Bungalow* (1915), and *Concrete Garages, the Fireproof Home for the Automobile* (1923).

Trade associations also published plan books. One such volume was *The Concrete House and Its Construction* published in 1912.

The final type of book, the catalogue from which one could order a complete house or other building in a kit form delivered to the building site, first came into existence around 1870 but achieved greatest success from 1900 to 1930. The popularity of the catalogue kit-house most closely coincided with and supported the growth, and perhaps the eventual decline, of ornamental concrete block use.

Several factors came together by 1900 to facilitate the mail-order kit-house concept. By the end of the 19th century the railroad systems in America really began to form a transportation network in reality as well as name. The majority of American communities were either on a rail link or had fairly easy access to rail service. The rapid and speedy movement of freight, including a diversity of building materials, was increasingly possible. The spread of mass-circulation magazines raised people's conscience in terms of taste and style. Families increasingly looked to magazines and catalogues to define good taste and design. And finally, the Rural Free Delivery Act of 1896 established the catalogue as a viable way of conducting trade with a vast segment of the population. These enabling factors occurred at a time when the nation's population was swelling. Between 1890 and 1910 America's population grew by 50%. That translated into a need for housing. Prefab catalogue houses offered one possible solution.

Long-term mortgages at the turn of the century were quite rare. Catalogue homes allowed for paced purchases. Land could be obtained and a foundation laid as time and money allowed. Catalogue sellers generally offered terms on materials, and when the supplies arrive on-site, labor for the assembly could be family-supplied or obtained at a reasonable price.

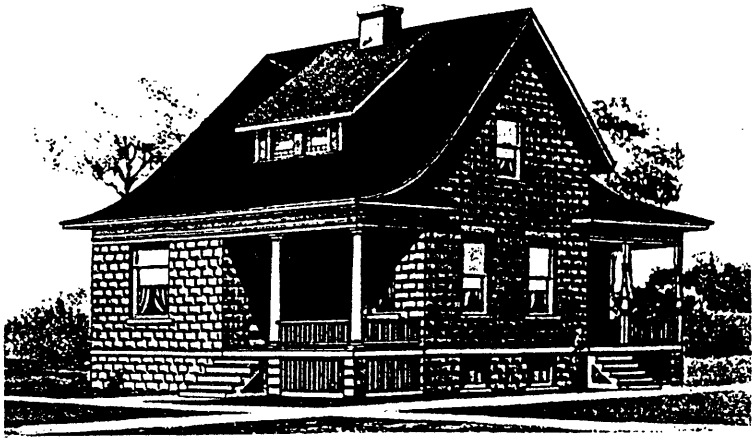
Figure 5

Sears Concrete Block Catalogue Kit-Houses

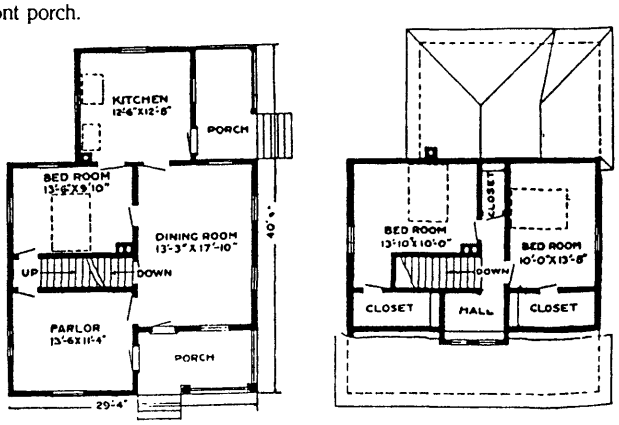
Style No(s).		Years Available 1908	1911	1912	1913	1916	1917	1918
64	(211)	⌂	⌂	⌂	⌂			
70	(212)	⌂	⌂	⌂	⌂			
59		⌂	⌂					
152	(Canton)		⌂		⌂	⌂	⌂	⌂
52	(209)		⌂	⌂	⌂	⌂		
143			⌂	⌂	⌂	⌂		

Figure 6

No. 64



A very substantial house and so designed that it can be constructed at the very lowest possible cost. Six large rooms arranged so that there is practically no wasted space whatever. Inside cellar stairs directly under the stairs leading to the second floor. You will note the convenient arrangement in the floor plan which enables you to go from the kitchen through the bedroom up to the second floor or to the parlor without going through the dining room. The dining room and parlor each have an outside door leading to the front porch.



Sears Catalog House, 1908
Source: Stevenson, *Houses by Mail*

Sears went the farthest and began offering mortgage loans in 1911, although the amount was based on the cost of the materials purchased from Sears. By 1918 the credit policies had been extended so that "under our plan we supply practically all the material on credit, and, if necessary, advance a portion of the cash required to pay the workmen for putting up the house."[13]

Six major companies dominated the market in the supply of pre-cut, conventional balloon-frame houses, advertising and selling on a national basis. Almost all the firms were founded or began catalogue sales within a few years of each other. The Gordon-Van Tine and Aladdin catalogues began catalogue sales in 1906. The following year Lewis issued its first catalogue followed by Sears in 1908. Sears' arch rival, Montgomery Ward, produced its first plan catalogue in 1910. Sterling was a relative late comer when it issued its first catalogue in 1915.

The rise of catalogue sales coincided with the availability of ornamental concrete block construction. Sears in particular offered several styles of concrete block houses (Figure 5) and many of the other catalogue homes utilized concrete block at least as a foundation material. Although Sears showed concrete block in its designs and listed it in the specifications, the blocks were not part of the delivered materials and were excluded from the cost. Purchasers could either buy a block machine as part of the package and

[13] From an internal Sears memo. Boris Emmet and John E. Jeuck. *Catalogues and Counters: A History of Sears, Roebuck and Company.* (Chicago: Univ. of Chicago Press, 1950) p. 268.

make their own block, or arrange to obtain the block locally. Either way, the sales of the concrete block catalogue houses led to the sale of block machines.

Since a modest house required 1,000 to 2,000 blocks and two story model as many as 6,000, those who chose to press their own blocks devoted a lot of spare time and rainy days to block fabrication. Yet for those on tight budgets, self-produced blocks offered an affordable means of building a sturdy, long lasting, and low maintenance house. Machines were also purchased to manufacture block for house additions, for garages and other residential outbuildings, and for the construction of agricultural structures. Once a project was completed the machines could be sold to a neighbor to recoup much of the initial investment. Many owners put their idle machines to work by turning to commercial block production, either on a part or full-time basis.

The development of automated vibrating machines in the 1930s capable of multiple block production hastened the end of private block production and the one or two man commercial operations. "Backyard" production no longer offered a substantial cost savings over commercially produced block and by 1940 only large, multi-product commercial companies still offered concrete block.

Decline of Ornamental Concrete Block Construction

Changes in taste and technology in the 1930s led the concrete and building industries to shift into greater production of the more utilitarian and less decorative plainface blocks. The mass production machines of the 1930s did not allow for cast, ornamental faces. Concrete block had proved itself as an important and versatile building material but its greatest potential was not as a decorative element but rather as structural element to which more decorative brick, plywood, or artificial siding could be applied.

Stylistically, the rise of modernism and its call for smooth faced surfaces played a role in the decline of ornamental block construction. Smooth faced block buildings were most often painted or stuccoed. Gas stations of the period often used block in this form. More often concrete, or its newer cinder block cousin, provided load bearing strength but were covered with decorative finish materials such as tile, porcelain, stone, or brick.

Mail-order catalogue firms continued to advertise block machines through the 1920s but with steadily decreasing catalogue space and units offered. The 1928 Sears catalogue devoted only a half-page to concrete block and offered only the a single machine, although it did continue to publish a separate Concrete Machinery Catalog. By 1933, Sears stopped advertising concrete block machines entirely.

The modern concrete masonry unit, a return to the original block concept found in the Foster Block, continues to be a major building material. But by 1940, the use of concrete block as an ornamental building material was largely over.

Concrete Block Construction in Colorado

Concrete block buildings are widely if unevenly distributed across Colorado. A comprehensive statewide survey to identify concrete block buildings has never been undertaken. Concrete block buildings and structures have been identified as a result of other survey projects and reconnaissance surveys in selected communities identified additional examples. Residential properties form the largest single group of identified properties. Small commercial buildings form another significant category and

agricultural properties, both residential and production-related, form a third. Evidence indicates that concrete block was also used in a number of transportation-related capacities for bridge abutments, culverts, and retaining walls.

The production of concrete block in Colorado follows a pattern similar to that found on a nationwide scale. Manufacture took place in commercial operations and by private individuals. Though these two types of production are related, they are best examined separately to be fully understood.

Information on the concrete block industry in Colorado is sketchy. The Colorado Business Directories provide a source for statewide evaluation of the commercial aspects of the industry. The directories are subject to inaccuracies and are best used to paint large pictures and draw general conclusions. They do show a definite industrial trend for the commercial production of concrete block.

Figure 7

Total Number of Commercial Concrete Block Manufacturers in Colorado 1907 - 1930

Year	Number of Manufactures	Year	Number of Manufactures
1907	23	1918	13
1908	39	1919	7
1909	49	1920	7
1910	58	1921	4
1911	58	1922	9
1912	32	1923	9
1913	28	1924	9
1914	22	1925	4
1915	19	**	
1916	18	1930	1
1917	14		

Source: Colorado Business Directories, 1907-1930

Figure 8

Number of Communities in Each County Containing a Concrete Block Manufacturer for One of More Years 1907 - 1925

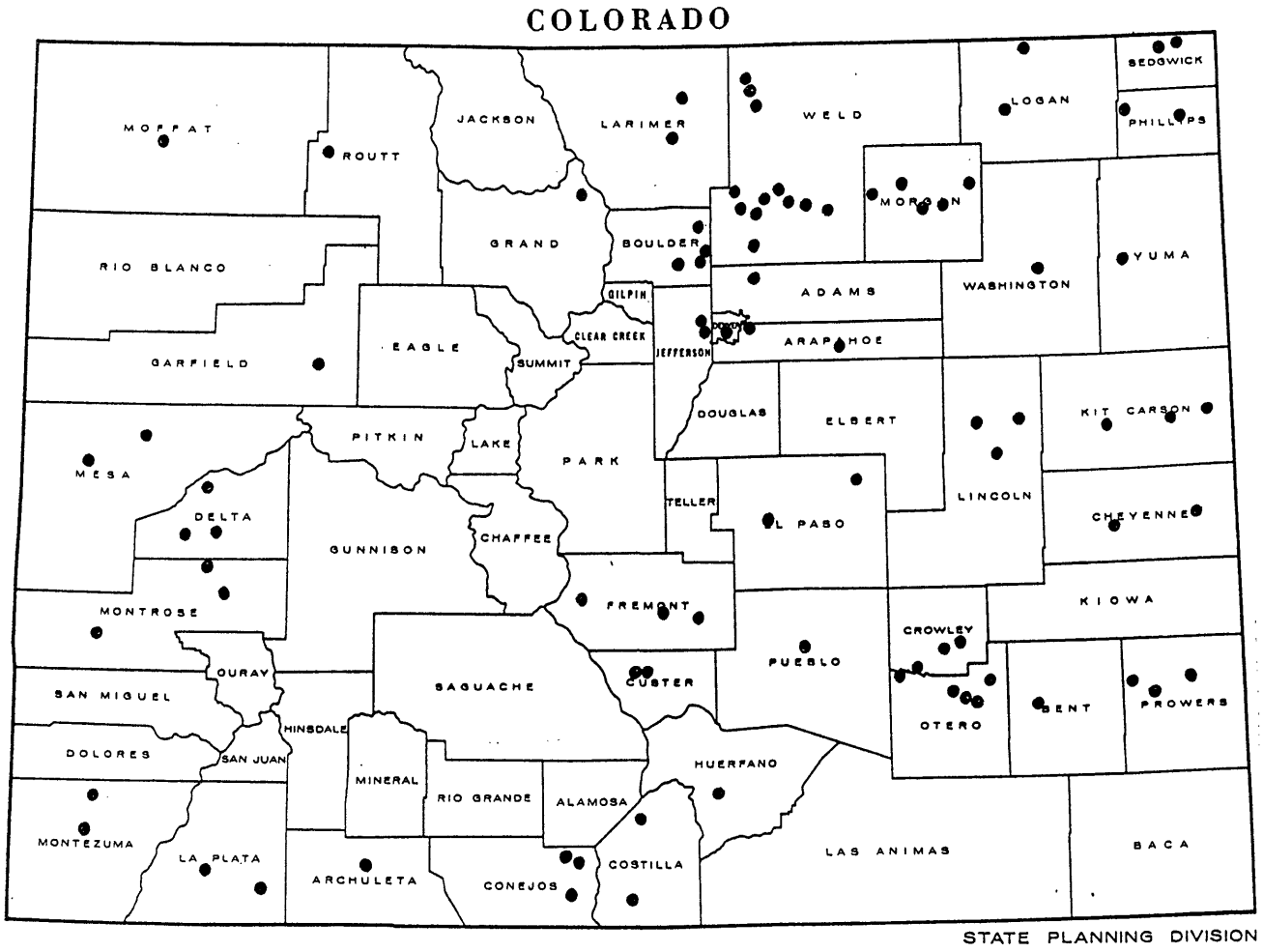
County	No. of Comm.	County	No. of Comm.
Weld	11	Larimer	2
Morgan	5	Logan	2
Boulder	4	Mesa	2
Crowley	4	Montezuma	2
Otero	4	Phillips	2
Conejos	3	Adams	1
Delta	3	Archuleta	1
Fremont	3	Bent	1
Kit Carson	3	Denver	1
Lincoln	3	Garfield	1
Montrose	3	Grand	1
Prowers	3	Huerfano	1
Arapahoe	2	Moffat	1
Cheyenne	2	Pueblo	1
Costilla	2	Routt	1
Custer	2	Sedgwick	1
El Paso	2	Washington	1
Jefferson	2	Yuma	1
La Plata	2		

Source: Colorado Business Directories, 1907-1930

The directories first list concrete block manufacturers as a specific topical heading in 1907 (Figure 7). In that year a total of 23 manufacturers were listed in 18 Colorado communities. Earlier listings may be found in individual city directories. The 1904 Denver directory lists John T. Saltile in the cement building trade with a note that he sold "patented granitized stone." The first Denver company specifically noted as selling as selling concrete block comes in 1905 when the city directory includes the Utopian Concrete Block Co.

The number of commercial manufacturers grew steadily from 1907 to a peak in 1910-11 with 58 firms included in the state business directories. In 1912 the number dropped nearly in half and in the following years the number of concrete block producers steadily declined. By 1921 the number had slipped to four, but the post-Word War I

Figure 9



Location of Known Concrete Block Plants, 1907 - 1930

economic revival saw the number of manufacturers hover at nine. The revival was short-lived. By 1925 the state totals slumped to four again and by 1930 only a single commercial firm in Sterling still cranked out concrete blocks.

Although concrete block manufactures were widely spread across the state, the distribution was uneven. The vast majority of manufacturers set up business in the eastern plains (Figure 9). During the 1907-1925 period Weld County led every county in the state with 11 communities supporting a plant for at least one year (Figure 8). Other counties with 4 or more concrete block manufacturing communities include Morgan, Boulder, Crowley, and Otero. Figure 10 shows the distribution of communities with commercial concrete block manufacturers for at least a single year during the 1907-1925 period. Many block manufacturers lasted in business for no more than a year. A few operated for multi-year periods.

Figure 10

Communities with Block Manufacturers
For 1 to 3 Years

Arriba	Golden	Mesiat
Ault	Grand Lake	Montrose
Austin	Hayden	Morrison
Blanca	Hillrose	Olney Springs
Bristol	Holyoke	Orchard
Burlington	Howard	Ordway
Calhan	Huxton	Palisade
Cedaredge	Johnstown	Pierce
Cherow	Julesburg	Sanford
Cheyenne Wells	Kit Carson	Seibert
Deer Trail	Kuner	Sligo
Delta	Lafayette	Stratton
Dolores	La Jara	Swink
Durango	Loveland	Weldona
Fowler	Manassa	Westcliffe
Gilcrest	Maybell	Wiley
Glenwood Springs		

Communities with Block Manufacturers
For 4 to 6 Years

Akron	Grand Junction	Nunn
Aurora	Hugo	Ovid
Brighton	Ignacio	Pagosa Springs
Brush	Kersey	Peetz
Cortez	Lamar	Platteville
Erie	La Salle	Pueblo
Florence	La Veta	Sugar City
Fort Collins	Nucla	Yuma

Communities with Block Manufacturers
For 7 or More Years

Boulder	Fort Morgan	Longmont
Cañon City	Greeley	Olathe
Colorado Springs	La Junta	Rocky Ford
Denver	Las Animas	Silver Cliff
Fort Lupton	Limon	Sterling

Viewed in terms of those communities that supported a concrete block manufacturer for four or more years during 1907 to 1925, Weld County still heads the state with 6 towns (Figure 11).Boulder is second with 3 towns having plants in operation for four or more years, and six more counties contained two communities with concrete block manufacturers for four or more years.

Figure 11

Number of Communities in Each County Containing a Concrete Block Manufacturer for 4 of More Years 1907 - 1925

County	No. of Comm.	County	No. of Comm.
Weld	6	Crowley	1
Boulder	3	Custer	1
Fremont	2	Denver	1
Lincoln	2	El Paso	1
Logan	2	Huerfano	1
Montrose	2	La Plata	1
Morgan	2	Larimer	1
Otero	2	Mesa	1
Adams	1	Montezuma	1
Arapahoe	1	Prowers	1
Archuleta	1	Pueblo	1
Bent	1	Sedgwick	1
		Washington	1
		Yuma	1

Source: Colorado Business Directories, 1907-1925

Of the 88 communities that were listed in the state business directories with one or more concrete block manufacturers during the 1907-1925 period, the majority had a commercial outlet for 1 to 3 years (Figure 10). Another 24 towns supported plants for 4 to 6 years, and a group of 15 communities patronized block distributors for 7 or more years. Cañon City led the state with at least one block manufacturer in business for 18 years; followed by Colorado Springs at 14 years; Olathe at 13 years; Boulder at 11 years; and Denver, Greeley, Longmont, and Rocky Ford at 10 years each. Based on this distribution, one might predict that all other factors being equal, the highest number of concrete buildings constructed would most likely be in Cañon City followed by the other communities noted above. Unfortunately, the business directories do not indicate the output, in relative or actual terms, of the various manufacturers across the state. A community with a series of single, short-lived, one man operations might appear consistently in the yearly totals but produce far fewer blocks than a community with a large commercial plant that operated for only a short period of time. However, in the lack of more definitive measurements, Figure 10 provides three groupings of communities which may be classified as having a low, medium, or high degree of probability for containing concrete block structures.

Figure 12

Distribution of Manufacturers by Commercial Name

	1910	1911
Single individual name	23	28
Company and multiple individual names	35	30

Source: Colorado Business Directories

The Palmer Block Machine and its many imitators allowed a single individual to manufacturer blocks on a limited commercial basis. A single individual might produce 50 to 150 blocks a day, enough to supplement earnings from another occupation or to provide a limited income between other economic pursuits. Figure 12 shows the number of state business directory listings of manufacturers under a single individual name and those under a multiple individual or company name. The

classification is far from definitive. Entrepreneurs have long realized the appearance of size and prominence which attaches itself to an impressive company title. It may be assumed that some of the company names associated with block makers may be single individual operations. It is also likely that manufacturers listed as a single individual employed family members or a regular or irregular basis to supplement production. The important point to note is that at the height of concrete block production in Colorado both single individual and multi-staff firms existed.

The business directories also indicate that for many firms the production of concrete blocks was only one element in a broader product and service mix. Company titles and occasional advertisements provide indications of the product range of each block manufacturer.

An examination of the business directory listings for 1910 and 1911 reveals block manufacturers who indicate by their business name that in addition to concrete blocks they deal in general concrete work or that they sell and/or produce cement products, tile, brick, stone, lime products, lumber, and building supplies. When it comes to innovative product diversification, few can beat the 1911 directory listing for Routt County's "Hayden Concrete, Gas and Electric Company."

More is known about the concrete block industry in Cañon City than any other Colorado community. Cañon City had a commercial concrete block factory as early as 1905 when that year's city directory recorded the existence of the Cañon City Cement & Building Block Factory with H. McKinstry as president. The following year John Ritzman opened a competing facility on South Ninth Street. By 1908, the Ritzman company was doing business as the Cañon City Cement Building Block and Tile Manufacturing Co. with offices and plant at 500 S. 9th Street. Lorentz Ritzman served as general manager. Not surprisingly, the Ritzman plant was constructed of ornamental concrete block. The plant continues to exist although recent alterations have significantly lessened its integrity.

Motivation to construct the Cañon City's Rio Grande Hotel in 1907 may have had more to do with creating a demonstration and promotional vehicle for the Ritzman concrete block. The prominent location of the hotel by the Rio Grande Railroad tracks and depot insured a steady traffic of potential concrete block clients who might be enticed to travel the two additional blocks down 9th Street to visit the plant itself. The wide variety of block faces used in the hotel also lends credence to the idea that the building was designed to be a showcase for the versatility and diversity of concrete block. Local contractor and builder A.C. Jensen actually designed and constructed the building.

The Cañon City Cement Building Block and Tile Manufacturing Co. prospered under Lorentz Ritzman. As the city with the largest number of identified ornamental concrete block structures, it is most likely that Ritzman's company was responsible for supplying the materials for a majority of them. Expanding into a variety of cement and cement related products, the company continued to serve Cañon City into the 1950s and beyond.

No information is available on the distribution of private individuals who produced concrete block for their own use. The ready availability of concrete block machines from mail order firms raises the probability of finding isolated concrete block buildings throughout Colorado built during the 1900-1940 period.

A search of recorded properties in the Site Files database of the Office of Archaeology and Historic Preservation (OAHP) at the Colorado Historical Society does not support any conclusions regarding the distribution of concrete block buildings in Colorado. Only 13 buildings were identified (Figure 13). It is quite possible that additional concrete block buildings may be in the database but have been mistaken for stone construction. The Olgnin House (5CT47.9) in San Luis is a case in point. The site form indicates the building is of stone construction, but a close examination of the accompanying photograph reveals that the house is in fact composed of ornamental concrete block.

Figure 13

Concrete Buildings in Colorado
From O.A.H.P. Site Files Database

Construction Property Name	Location	Date	Site No.
Maxwell Creek Schoolhouse	Buena Vista	c. 1889	5CF733
Olgnin House	San Luis	c. 1900	5CT47.9
Unnamed house and barn	Wattenberg vicinity	c. 1900	5WL1413
First Bank of Fruita	Fruita	1904	5ME2337
Salazar House	San Luis	1906	5CT47.18
Rio Grande Hotel	Cañon City	1907	5FN586
Phillips House	Fruita	1908	5ME7381
Williams House	Aurora	c. 1908	5AM328
Orpheum Theater	Buena Vista	1910	5CF830
Valmont School	Boulder	1911	5BL478
Shelton-Holloway	Glenwood Springs	1912	5GF1654
Phillips County Abstract Co.	Holyoke	c. 1920	5PL35
Unnamed commercial	Cañon City	c. 1927	5FN1238.1

Construction dates on OAHP database identified buildings range form ca. 1889 to Ca. 1927. Obviously, if the construction fate of the Maxwell Creek Schoolhouse is correct, the building predated the established ornamental block period by more than a decade. If further research confirms the date then it will be an extremely rare pre-Palmer Block Machine building.

Figure 14

Concrete Block Buildings Found During Reconnaissance Surveys

Community Surveyed	# of Properties Surveyed
Aurora	1
Cañon City	16
Fort Morgan	6
Goodrich	2
Orchard	0
Rural Morgan County	2
Weldona	0
Total Properties Surveyed	27

Source: Colorado Business Directories

Reconnaissance surveys conducted during the spring of 1996 in several high probability communities identified additional examples of concrete block buildings, both residential and commercial. Communities surveyed and the number of concrete block buildings found are indicated in Figure 14.

Figure 15 shows the breakdown of identified concrete block buildings by major functional categories. The number of identified properties is too small to draw any conclusions other than to say that examples continue to exist in a variety of functional types, although examples of agricultural and public buildings appear to be rare.

Figure 15

Functional Type Distribution

Functional Types	No. of Properties Identified
Single dwelling - urban	20
Single dwelling - rural	3
Secondary residential	3
Agricultural outbuilding	2
Commercial/industrial	10
Public	2
Total properties identified	40

Source: Colorado Business Directories

Architecturally, some general characteristics may be noted. Because concrete block resembles and shares construction qualities with both brick and stone, it is used in similar ways. The blocks are generally used in load bearing walls but may also be found as veneer in wood-frame construction. In residential construction the gable ends, decorative trim, porch columns and balustrades, and dormers are most often of wood or shingle construction. In some cases, the concrete block extends through the gable ends to the roof line. The Phillips House in Fruita is an example. Porch columns may also be made of concrete block, as is the case with the Williams House in Aurora. In other cases the porch columns are of cast concrete in a variety of classical and fanciful designs. Cañon City contains a number of residential properties with distinctive cast concrete porch columns. Particularly interesting examples include houses at 704 College Ave., 920 S. 12th Street, and 915 S. 3rd Street.

Concrete block houses may be found in a variety of ground plans including square, rectangular, L-shaped, and irregular. The one story size predominates but one-and-one-half and two story examples may also be found.

Rockfaced blocks are the predominate form. Plain faced blocks are often used as belt courses, quoins, and window surrounds. In a lesser number of cases the plain face block is used as the primary wall surface with rockface, panel face and other designs employed as ascent. The two-story house at 815 Prospect in Fort Morgan is a particularly good example of predominately plain face block construction.

Colorado's concrete block houses tend to employ architectural characteristics of a number of styles in vogue during the 1900-1940 period. Elements of Queen Anne, Italianate, Edwardian, Classical Revival, Dutch Colonial Revival, and Craftsman/Bungalow are all represented. The one story pyramidal form and the Foursquare with their uncomplicated boxiness lent themselves well to the uniform, rectangular blocks.

A number of mail-order companies offered catalogue or kit versions of concrete block houses. There is no indication that any of the residential buildings identified in the reconnaissance or database survey are of catalogue origin. With the wide distribution of the catalogues, the extent of their usage, and the ready availability of necessary transportation providers after 1900, particularly the railroads, it is quite possible that one or more catalogue houses exit in Colorado.

Secondary residential structures include carriage houses, garages, and storage buildings. Concrete block use in Colorado began after 1900, the same point at which the automobile began to push carriages into museums and horses out to pasture. Concrete block carriage houses will most likely be found dating close to the beginning of the century with garages being more common by the

1920-1940 period. One carriage house was identified in Fort Morgan while ironically a concrete block garage faced it across the street.[14]

Utilitarian designs predominate in commercial and industrial concrete block buildings. Retail/business buildings contain traditional storefront designs with office or domestic space above in two-story structures. Parapet walls are common. Industrial buildings are often found with stepped parapets. As in residential construction, rockfaced block is the most common form in commercial buildings. Plainfaced block may be found as belt courses, sills and lintels, cornice treatment, and as a side and rear wall material.

Figure 16

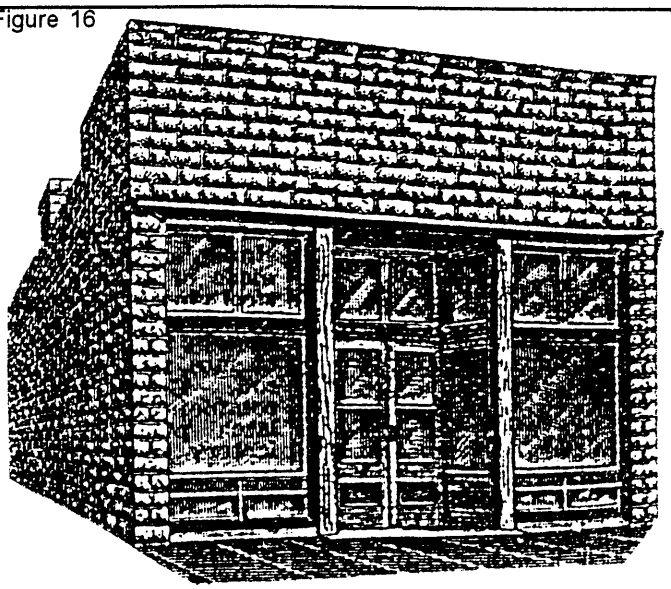


Illustration from the 1907 Sears Catalogue

Too few agricultural buildings have been identified to make any statements as to design. Because the rockfaced pattern was the standard form shipped with most block machines, it is likely that the majority of agricultural buildings were constructed in this pattern.

Only two public buildings, both one room schools, have been identified[15]. As with other concrete block buildings, rockfaced block is utilized and the overall design is similar to that found in brick and stone schoolhouses of the same period.

The history of ornamental block construction in Colorado appears to echo the national pattern. Many manufacturers established themselves shortly after the introduction of the Palmer-type machines. The number of plants peaked by 1911 and steadily declined until virtually disappearing by 1930.

A variety of buildings exist, both functionally and architecturally, from the period. The use of ornamental concrete block forms a small but important part of the State's architectural history.

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[14] Carriage house located on the northwest corner of Bijou Ave. and Lake St.; garage located on southeast corner of Bijou Ave. and Lake St.

[15] Valmont School in Boulder (5BL478) and the Maxwell Creek School near Buena Vista (5CF733).

ASSOCIATED PROPERTY TYPES

Name of property type: Ornamental Concrete Block Residences and Associated Secondary Structures

In order to qualify for listing in the National Register under Criterion C in the area of architecture, residences and associated secondary structures must have been built primarily of concrete block as the exterior wall surface. Painted block buildings remain eligible as long as long as the ornamental face patterns of the blocks remain visible. Concrete block buildings which have been stuccoed are not considered eligible as they have lost integrity of design, materials, and workmanship. Eligible buildings may contain wood, shingles, stone or other materials if they are used for trim or as secondary materials. The buildings must have integrity of design, materials, and workmanship.

In order to qualify for listing in the State Register under Criterion "c" in the area of architecture, residences and associated secondary structures must contain discernible amounts of concrete block, including the use of the material for trim or as a secondary material. Examples include the use of block as a visible foundation, in belt courses, for porch columns or balustrades, in chimneys or as a decorative element in a stone or brick building. Eligible structures may also include walls and fences.

Properties may be evaluated in a local or state context to identify the best, sole surviving, or innovative examples.

Subtype: Catalogue houses and secondary structures

In order to qualify for listing in the National Register under Criterion C in the area of architecture as a catalogue house or secondary, the resources must have been built primarily of concrete block as the exterior wall surface and must retain sufficient integrity of design, materials and workmanship to convey their catalogue origins. Painted block buildings remain as long as long as the ornamental face patterns of the blocks remains visible.

Subtype: Porch additions

The use of concrete block in porch modifications to older houses was an important part of the historical use of concrete block. Particularly intact examples of older houses with "modernized" porches of concrete block and molded concrete forms will be considered eligible for the State Register under Criterion "c". The house and porch must retain integrity from the period in which the porch modifications were made.

Name of property type: Ornamental Concrete Block Commercial/Industrial Buildings

In order to qualify for listing in the National Register under Criterion C in the area of architecture, commercial/industrial buildings must have been built primarily of concrete block as the exterior wall surface. Painted block buildings remain as long as long as the ornamental face patterns of the blocks remains visible. Concrete block buildings which have been stuccoed are not considered eligible as they have lost integrity of design, materials, and workmanship. Eligible buildings may contain wood, shingles, stone or other materials if they are used for trim or as secondary materials. The buildings must have integrity of design, materials, and workmanship.

In order to qualify for listing in the State Register under Criterion "c" in the area of architecture, residences and associated secondary structures must contain discernible amounts of concrete block, including the use of the material for trim or as a secondary material. Examples include the use of block as a visible foundation, in belt courses, chimneys or as a decorative element in a stone or brick building.

Properties may be evaluated in a local or state context to identify the best, sole surviving, or innovative examples.

Name of property type: Ornamental Concrete Block Agricultural Buildings

In order to qualify for listing in the National Register under Criterion C in the area of architecture, agricultural buildings and structures must have been built primarily of concrete block as the exterior wall surface. Painted block buildings remain as long as long as the ornamental face patterns of the blocks remains visible. Concrete block buildings which have been stuccoed are not considered eligible as they have lost integrity of design, materials, and workmanship. Eligible buildings may contain wood, shingles, stone or other materials if they are used for trim or as secondary materials. The buildings must have integrity of design, materials, and workmanship.

In order to qualify for listing in the State Register under Criterion "c" in the area of architecture, residences and associated secondary structures must contain discernible amounts of concrete block, including the use of the material for trim or as a secondary material. Examples include the use of block as a visible foundation or belt courses.

Properties may be evaluated in a local or state context to identify the best, sole surviving, or innovative examples.

Subtype: Silos

Special concrete molds were available to produce concrete block to form round structures. The primary use of this form was in the construction of farm silos. Anecdotal evidence indicates that the use of concrete block in silo construction constitutes the single largest category of agricultural structure.

In order to qualify for listing in the National Register under Criterion C in the area of architecture, silos must have been built primarily of concrete block as the exterior wall surface. Stuccoed silos are not considered eligible as they have lost integrity of design, materials, and workmanship.

Name of property type: Ornamental Concrete Block Public Buildings

Public buildings are defined as those built and operated under public ownership or where the primary function was for public, non-profit activities. Examples include government buildings, schools, churches, and community halls.

In order to qualify for listing in the National Register under Criterion C in the area of architecture, public buildings must have been built primarily of concrete block as the exterior wall surface. Painted block buildings remain as long as long as the ornamental face patterns of the blocks remains visible. Concrete block buildings which have been stuccoed are not considered eligible as they have lost integrity of design, materials, and workmanship. Eligible buildings may contain wood,

shingles, stone or other materials if they are used for trim or as secondary materials. The buildings must have integrity of design, materials, and workmanship.

In order to qualify for listing in the State Register under Criterion "c" in the area of architecture, public buildings must contain discernible amounts of concrete block, including the use of the material for trim or as a secondary material. Examples include the use of block as a visible foundation, belt course, porch column or balustrade, chimney or as a decorative element in a stone or brick building.

Properties may be evaluated in a local or state context to identify the best, sole surviving, or innovative examples.

Name of property type: Ornamental Concrete Block Manufacturing Facilities

Concrete block manufacturing facilities may be eligible for the National register under Criterion C if they meet the registration requirements for concrete block commercial/industrial buildings. In addition, concrete Block manufacturing facilities may be eligible under Criterion A for the historical significance in the area of industry regardless of their exterior materials. To be eligible the buildings must have a substantial association with the manufacture and/or sale of ornamental concrete block and they must retain their historic integrity from the period of significance.

GEOGRAPHICAL DATA

The context developed in this Multiple Property Document Form relates to the entire State of Colorado.

SUMMARY OF IDENTIFICATION AND EVALUATION METHODS

The multiple property submission is based on a database survey of known concrete block buildings in Colorado and a reconnaissance survey conducted in 1996 by the staff of the Office of Archaeology and Historic Preservation at the Colorado Historical Society. Communities surveyed are shown in Figure 14 and the results of the database search are shown in Figure 13.

Archival research was also conducted early in 1996 to establish the history of concrete block construction nationally and in the State of Colorado. Both primary and secondary sources were consulted.

Concrete block construction begins in Colorado, as with the nation in general, following the 1899 invention of the cast iron block machine by Harmon S. Palmer. Results of the archive research and reconnaissance survey indicated that concrete block buildings were built throughout the State with regional variations in design, period of construction, density, and period of construction. Three main groups of structures appeared to predominate: residences and associated secondary structures; commercial buildings; and agricultural buildings. All of these property types were constructed from 1900 and continuing through 1940. However, by the end of the period, the use of ornamental concrete block as a primary exterior building material in residential construction had largely passed from favor. Commercial applications continued, and in fact expanded, but the composition of the blocks changed considerably to the extent that they might be generally classified as cinder block or concrete masonry units as opposed to ornamental concrete block. The practice of private individuals manufacturing concrete blocks for their own building purposes also declined to near the point of nonexistence by 1940. Thus the period from 1900 to 1940 represents the period when the material was successfully developed and used as a primary exterior surface material for its structural, decorative, and economic value. Significant property types were considered to be those which best illustrated the uses of concrete block across Colorado during the 1900 - 1940 period.

Integrity requirements were based on a traditional interpretation of National Register integrity aspects as well as the results of the reconnaissance and database survey. Survey results indicated that good intact examples of concrete block buildings from the period do exist, but that large numbers have been altered through new construction, partial demolition, and modern surface treatments. The number of demolished buildings is not known. Regional variations were also noted. In some portions of the state, a number of buildings with good integrity remained while in others only isolated structures in any condition could be found. In some cases this was because of the infrequent use of concrete block while in others it represented the loss of a once larger resource base. The initial property nominated as part of this multiple property submission, the Phillips House in Fruita, retains a high degree of integrity and represents one of the best surviving examples in the State.

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