

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

FOR NPS USE ONLY	
RECEIVED	MAR 12 1981
DATE ENTERED	JUL - 8 1981

**NATIONAL REGISTER OF HISTORIC PLACES
INVENTORY -- NOMINATION FORM**

SEE INSTRUCTIONS IN *HOW TO COMPLETE NATIONAL REGISTER FORMS*
TYPE ALL ENTRIES -- COMPLETE APPLICABLE SECTIONS

1 NAME

HISTORIC

Iron Turbine Windmill

AND/OR COMMON

2 LOCATION

STREET & NUMBER Grounds of the Sharlot Hall Historical Museum
415 West Gurley Street

CITY, TOWN

Prescott

NOT FOR PUBLICATION

CONGRESSIONAL DISTRICT

3

STATE

Arizona

VICINITY OF

CODE

04

COUNTY

Yavapai

CODE

025

3 CLASSIFICATION

CATEGORY	OWNERSHIP	STATUS	PRESENT USE
<input type="checkbox"/> DISTRICT	<input checked="" type="checkbox"/> PUBLIC	<input type="checkbox"/> OCCUPIED <input checked="" type="checkbox"/> N/A	<input type="checkbox"/> AGRICULTURE <input checked="" type="checkbox"/> MUSEUM
<input type="checkbox"/> BUILDING(S)	<input type="checkbox"/> PRIVATE	<input type="checkbox"/> UNOCCUPIED	<input type="checkbox"/> COMMERCIAL <input type="checkbox"/> PARK
<input checked="" type="checkbox"/> STRUCTURE	<input type="checkbox"/> BOTH	<input type="checkbox"/> WORK IN PROGRESS	<input type="checkbox"/> EDUCATIONAL <input type="checkbox"/> PRIVATE RESIDENCE
<input type="checkbox"/> SITE	PUBLIC ACQUISITION	ACCESSIBLE	<input type="checkbox"/> ENTERTAINMENT <input type="checkbox"/> RELIGIOUS
<input type="checkbox"/> OBJECT	<input type="checkbox"/> IN PROCESS	<input type="checkbox"/> YES: RESTRICTED	<input type="checkbox"/> GOVERNMENT <input type="checkbox"/> SCIENTIFIC
	<input type="checkbox"/> BEING CONSIDERED	<input checked="" type="checkbox"/> YES: UNRESTRICTED	<input type="checkbox"/> INDUSTRIAL <input type="checkbox"/> TRANSPORTATION
		<input type="checkbox"/> NO	<input type="checkbox"/> MILITARY <input type="checkbox"/> OTHER:

4 OWNER OF PROPERTY

NAME

Sharlot Hall Historical Society

STREET & NUMBER

415 West Gurley Street

CITY, TOWN

Prescott

VICINITY OF

STATE

Arizona

5 LOCATION OF LEGAL DESCRIPTION

COURTHOUSE,
REGISTRY OF DEEDS, ETC.

Yavapai County Courthouse

STREET & NUMBER

CITY, TOWN

Prescott

STATE

Arizona

6 REPRESENTATION IN EXISTING SURVEYS

TITLE

Arizona Historic Engineering Site Inventory

DATE

August 15, 1980

FEDERAL STATE COUNTY LOCAL

DEPOSITORY FOR
SURVEY RECORDS

History of Engineering Program, Texas Tech University

CITY, TOWN

Lubbock

STATE Texas

7 DESCRIPTION

CONDITION		CHECK ONE	CHECK ONE
<input type="checkbox"/> EXCELLENT	<input type="checkbox"/> DETERIORATED	<input checked="" type="checkbox"/> UNALTERED	<input type="checkbox"/> ORIGINAL SITE
<input checked="" type="checkbox"/> GOOD	<input type="checkbox"/> RUINS	<input type="checkbox"/> ALTERED	<input checked="" type="checkbox"/> MOVED DATE <u>1973</u>
<input type="checkbox"/> FAIR	<input type="checkbox"/> UNEXPOSED		

DESCRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE

The "Iron Turbine" windmill, located on the grounds of the Sharlot Hall Historical Museum in Prescott, Arizona, is one of the most striking in appearance of all the windmills manufactured in the United States. Instead of having straight blades as do most steel mills, it has bucket shaped blades with "a combination of a curved and spiral surface." The "buckets" and the vane are made from No. 24 sheet iron. Earlier models were finished with multiple coats of paint and later mills, such as this preserved example in Prescott, were hot dipped in a galvanizing bath.

As advertised, the windmills and the supporting steel towers were sold separately because the intended locations mandated different height requirements. The location of the original tower is not known and, at present, the working mechanism is placed upon a tower constructed of wooden members. The combined height of this tower and the windmill is approximately 50 feet.

The wheel of the mill consists of the sheet steel "buckets" attached to gas pipe arms which are flattened at their outer ends and screwed into the cast iron wheel hub at their inner ends. Each of the "Buckets" are braced with two wrought iron rods which connect and support them. The mills were made in eight and one-half, ten and twelve foot diameters with six, seven and ten "buckets" to the wheel respectively. This mill is a ten foot pattern with seven buckets. The vane is a ten foot rectangular extension situated perpendicular to the wheel.

The early "Iron Turbines" were direct stroke mills with one revolution of the wind wheel producing one pump stroke, as is the case with the mill at Prescott. On these mills, the motion of the turning wheel is transmitted on the main shaft, passing through babbitted bearings, to a crankplate at its rear end. This crank plate is connected by a pitman with brass bushings to an elbow-shaped rocker arm mounted at its other end to the main casting. The rocker arm supports a gas-pipe pump rod which passes downward through the main casting to a point where the wooden pump rod is attached within the tower. Later "Iron Turbine" mills were back geared two to one through the use of an internal gear mechanism.

The wheel of the mill is set slightly to one side so that, in high winds, it automatically tends to turn out of the wind. As it does so, the linkage on the governor system causes the end of the vane to pivot upward, serving the function of a governor weight. When the wind velocity decreases, the weight of the vane pulls the wheel back to face the wind squarely, giving the mill a more-or-less constant rate of operation. A friction brake rubbing on the wheel hub engages when the mill is cut off by an operator on the ground, but it does not engage when the wheel automatically turns out of the wind in governing as is common in other windmills.

Lubrication on the mill has one interesting element. Although the main bearings are oiled through the simple use of grease cups above the two bearings, the lubrication of the pitman originally was through the use of a clear glass oiler containing a one-week supply of lubricant. Thus, as sales literature stated, "it is necessary to oil only when you can see from the ground that the glass oiler is empty." The company recommended that, in winter, when most oils of the period tended to congeal, "strained lard mixed with about one-third coal oil is the best" for lubrication.

6 SIGNIFICANCE

PERIOD AREAS OF SIGNIFICANCE -- CHECK AND JUSTIFY BELOW

<input type="checkbox"/> PREHISTORIC	<input type="checkbox"/> ARCHEOLOGY-PREHISTORIC	<input type="checkbox"/> COMMUNITY PLANNING	<input type="checkbox"/> LANDSCAPE ARCHITECTURE	<input type="checkbox"/> RELIGION
<input type="checkbox"/> 1400-1499	<input type="checkbox"/> ARCHEOLOGY-HISTORIC	<input type="checkbox"/> CONSERVATION	<input type="checkbox"/> LAW	<input type="checkbox"/> SCIENCE
<input type="checkbox"/> 1500-1599	<input type="checkbox"/> AGRICULTURE	<input type="checkbox"/> ECONOMICS	<input type="checkbox"/> LITERATURE	<input type="checkbox"/> SCULPTURE
<input type="checkbox"/> 1600-1699	<input type="checkbox"/> ARCHITECTURE	<input type="checkbox"/> EDUCATION	<input type="checkbox"/> MILITARY	<input type="checkbox"/> SOCIAL/HUMANITARIAN
<input type="checkbox"/> 1700-1799	<input type="checkbox"/> ART	<input checked="" type="checkbox"/> ENGINEERING	<input type="checkbox"/> MUSIC	<input type="checkbox"/> THEATER
<input checked="" type="checkbox"/> 1800-1899	<input type="checkbox"/> COMMERCE	<input type="checkbox"/> EXPLORATION/SETTLEMENT	<input type="checkbox"/> PHILOSOPHY	<input type="checkbox"/> TRANSPORTATION
<input type="checkbox"/> 1900-	<input type="checkbox"/> COMMUNICATIONS	<input type="checkbox"/> INDUSTRY	<input type="checkbox"/> POLITICS/GOVERNMENT	<input type="checkbox"/> OTHER (SPECIFY)
		<input type="checkbox"/> INVENTION		

SPECIFIC DATES Constructed between BUILDER/ARCHITECT
1876-1885

STATEMENT OF SIGNIFICANCE

The "Iron Turbine" windmill is the sole known intact example of the first mass produced all-metal windmill remaining in the Southwest and probably the United States. Produced by Mast, Foos and Company of Springfield, Ohio, from 1876 to ca. 1898, the mill is highly significant as it relates to the technical evolution of turbine wheel type water pumping windmills. The iron and steel construction figured prominently in advertising. The company proudly declared that their mill, "with no wood about it to swell, shrink, rattle and be torn to pieces by the wind" naturally was "much more durable" than any of its wooden competitors. As early as 1884, they could boast that their mills were in use in all the states and territories of the United States as well as in England, France, Germany, Russia, Australia, New Zealand and the Sandwich Islands.

The Prescott mill came to the Arizona Territory in 1885 when James P. Storm brought five of them to the area via Yuma. He erected one at his ranch at Big Chino, two for a neighbor, Nelson Puntenev, one on the Matli Ranch in Williamson Valley and one in the Verde Valley. Of these five mills, the one from the Matli Ranch survived. It is not known when it passed into the ownership of Robert Kuhne, a well driller and windmill, in the Prescott area. For several years, he employed the windmill in pumping water at his home. In 1973, he donated the mill to the Sharlot Hall Historical Museum in Prescott in order for it to be preserved. The total distance of the move from its original location at the Matli Ranch to the museum was 25 miles. Today, the "Iron Turbine" windmill is restored and re-erected on a wooden timber tower on the grounds of the museum. In this location, it is an important element in the museum's collection of Territorial artifacts.

9 MAJOR BIBLIOGRAPHICAL REFERENCES

Baker, T. Lindsay: "Turbine-Type Windmills of the Great Plains and Midwest." Agricultural History, LIV, No. 1 (January 1980), pp. 38-51.

"Chaining the Winds", The Mechanical News (New York), XIII, No. 1 (15 March 1883). pp. 1-2, 11.

ACREAGE NOT VERIFIED

10 GEOGRAPHICAL DATA

ACREAGE OF NOMINATED PROPERTY less/acre (24 sq. ft.)

UTM NOT VERIFIED

QUADRANGLE NAME Prescott, Arizona

QUADRANGLE SCALE 7.5'

UTM REFERENCES

A 1,2 | 3,6,4,7,3,0 | 3,8,2,3,0,0,0
 ZONE EASTING NORTHING

B | |
 ZONE EASTING NORTHING

C | |

D | |

E | |

F | |

G | |

H | |

VERBAL BOUNDARY DESCRIPTION

The structure is located in the SW corner of a city block occupied by the Sharlot Hall Museum. It is situated 28' to the west of the Museum building, 50' to the north of the Fort Misery building and occupies an area of 24 sq. feet.

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE	CODE	COUNTY	CODE
N/A			
STATE	CODE	COUNTY	CODE

11 FORM PREPARED BY

NAME / TITLE

T. Lindsay Baker, Research Consultant

ORGANIZATION

History of Engineering Program
 Texas Tech University

DATE

July 22, 1980

STREET & NUMBER

P.O. Box 4089

TELEPHONE

(806) 742-3591

CITY OR TOWN

Lubbock

STATE

Texas

12 STATE HISTORIC PRESERVATION OFFICER CERTIFICATION

THE EVALUATED SIGNIFICANCE OF THIS PROPERTY WITHIN THE STATE IS:

NATIONAL

STATE X

LOCAL

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

STATE HISTORIC PRESERVATION OFFICER SIGNATURE

Michael A. Harries

TITLE State Parks Director and Acting State Historic Pres. OFFICER

DATE March 5, 1981

FOR NPS USE ONLY

I HEREBY CERTIFY THAT THIS PROPERTY IS INCLUDED IN THE NATIONAL REGISTER

ATTEST: *Bill Groover*
 KEEPER OF THE NATIONAL REGISTER
Patrick Andrews
 CHIEF OF REGISTRATION

DATE 7/9/81

DATE 7/8/81

**United States Department of the Interior
Heritage Conservation and Recreation Service**

**National Register of Historic Places
Inventory—Nomination Form**

For HCRS use only

received

date entered

11 9 81

Continuation sheet Bibliographical Data

Item number 9

Page 2

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Mast, Foos and Company, Springfield, Ohio. The Improved Iron Turbine Wind Engine, Manufactured by Mast, Foos & Co., Springfield, Ohio. Form 6, 2-15-84-10,000. Springfield, Ohio: Mast, Foos & Co., (1884). (Available at Minnesota Historical Society Library, St. Paul, Minn.)

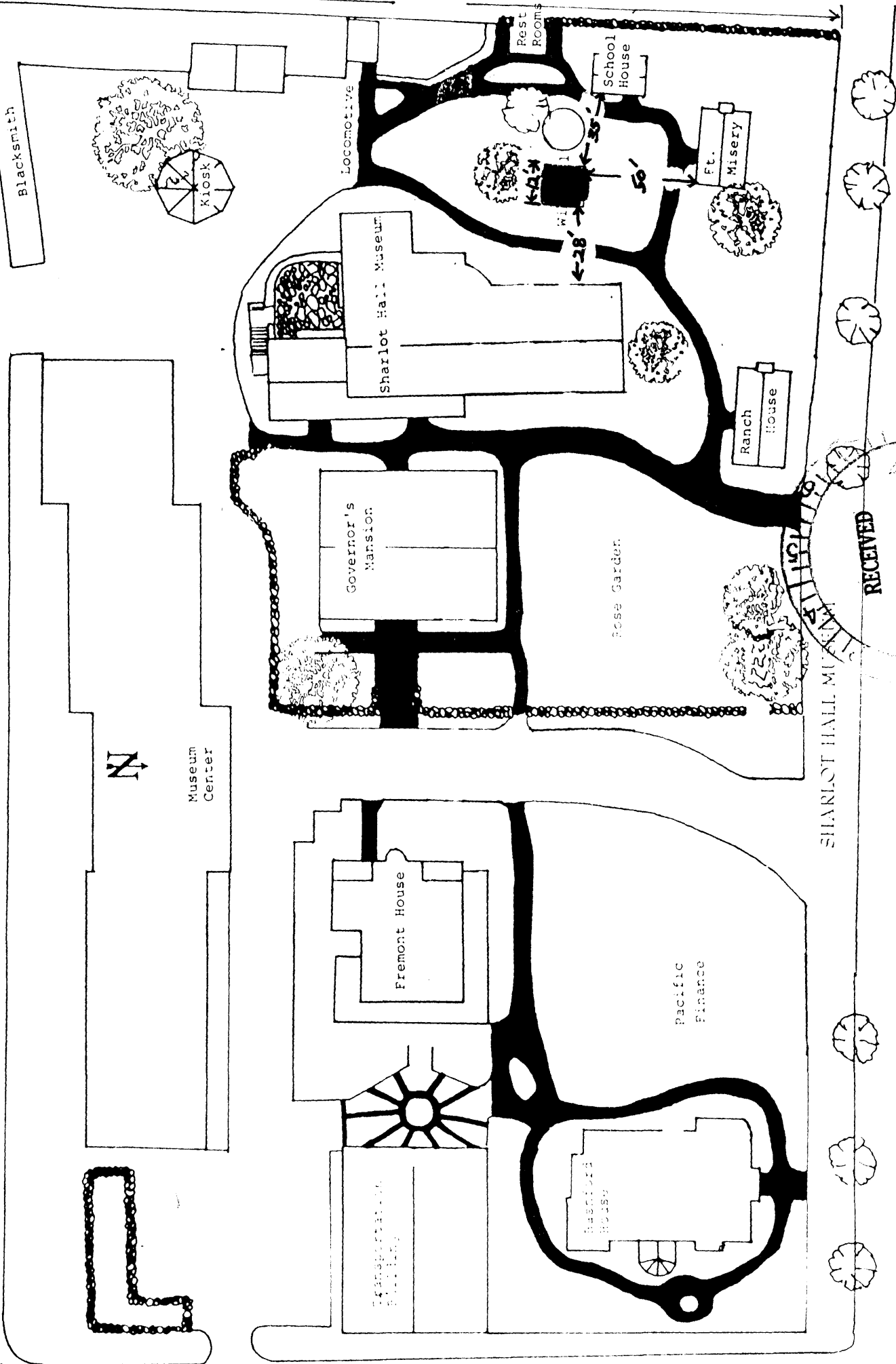
Mast, Foos and Company, Springfield, Ohio. Mast, Foos & Co., Pumps, Wind Mills, Lawn Mowers. Springfield, Ohio, U.S.A. Catalogue No. 14. Springfield Ohio: The Hosterman Publishing Co., (ca. 1898). (Available at Ohio Historical Society Library, Columbus, Ohio.)

Mast, Foos and Company, Springfield, Ohio. Mast, Foos & Co., Springfield, Ohio, U.S.A., Manufacturers of Iron Turbine Wind Engine, Buckeye Force Pumps, Buckeye Iron Fence, Buckeye Senior & Junior Lawn Mosers, Etc. Springfield Ohio: Globe Co., (ca. 1890). (Available in Library and Archives, Panhandle-Plains Historical Museum, Canyon, Texas.)

"Steel Wind Mills". The Farm Implement News (Chicago), XIII, No. 12 (24 March 1892), pp. 12-17.

Sharlot Hall Historical Museum, Prescott, Arizona. Document file for "Iron Turbine" windmill. TS and MS. Archives, Sharlot Hall Historical Museum, Prescott, Arizona.

Beach Street



Blacksmith

Museum Center

Governor's Mansion

Sharlot Hall Museum

Fremont House

Rose Garden

Pacific Finance

Ranch House

Rest Rooms

School House

Ft. Misery

SHARLOT HALL MUSEUM

Gurley Street

RECEIVED

MAY 27 1981

NATIONAL REGISTER

415 WEST GURLEY STREET

SCALE 1" = 40' (Approx.)

JUL - 9 1981