

Patterns and the Molding of Cast Iron Banks

Supplement No. 5: Cleaning Iron Castings*

Fritz Kokesh

A. INTRODUCTION

In the article: "Patterns and the Molding of Cast Iron Still Banks"¹ it was explained that after molds had been poured and had cooled overnight they were "shaken out" and the individual parts removed from the sprues. In the Grind Shop (which molders referred to as the "Snagging Room"²) remnants of gate were ground off each part and "flash" was removed if necessary. Parts next went to the Machine Shop for drilling and tapping, and then were cleaned by tumbling them with iron stars or agate balls.³ At that point the parts were ready for assembly and finishing.

The current article provides additional information about the grinding and tumbling operations. We begin by joining Mark Haber on an imaginary tour of the J. & E. Stevens Company:⁴

"Leaving the pattern casting shop, we were escorted to the finishing and buffing shop. 'This fine water wheel,' Mr. Coe proudly exclaimed, 'has furnished us with ample power for all our needs, since the plant was started in 1843... There is a dam and a sluice-way, by which the water is directed to the wheel... The belt connected from the main-shaft on the wheel, runs to overhead shafting to which belting is connected to a series of grinding wheels, buffing wheels, and spindles. Charles Nelson is at the first grinding wheel and is engaged in grinding off the ends of the gates on a pile of iron castings. George Howe is similarly engaged, while Edward Brown is placing the finished castings into the tumbling machines.'"

B. GRINDING

Figure 1 shows the Grind Shop of the Kenton Hardware Co. in 1913. Along the right side of the shop there is a row of grinding machines powered from overhead shafts (just like those described by Haber at the Stevens factory). In the left background are wooden barrels that probably contain parts from the foundry floor. After grinding parts were placed in wooden bins and sent to the Tumbling Shop.

C. TUMBLING

Small cast iron parts were tumbled in order to loosen sand adhered to the surfaces and to lightly polish the parts. "Tumbling Barrels" are the machines used for this purpose. One style (see Figure 2) was a barrel open at one end; the general configuration is not unlike a portable concrete mixer. Another style (Figure 3) was in the shape of a rotating cylinder with the long axis parallel to the floor. The barrel of the open-ended machines was steel, cast iron, or wood-lined. Steel was the standard. Wood barrels were used for castings of softer metals.

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Figure 1. Grind Shop of the Kenton Hardware Co. in 1913. In the left foreground is Michael Wachalec, the factory superintendent. Photo provided by Robert Saylor.

The barrels of the open-ended machines had diameters of 18" to 70" at the closed end. The machines were operated with the barrels 40 percent to two-thirds full. This gave the smaller machines a capacity of about 150 pounds of castings. The vigor of the cleaning was controlled by adjusting the angle of tilt of the barrel. *"If a gentle tumbling is required, the Barrel should be elevated to a fairly high position. If a violent action is wanted—run the Barrel in a horizontal position that gives maximum agitation."*⁵

Hard iron stars (Figure 4) were the "tumbling medium" for new castings. The points of the stars would loosen sand from the castings, and also would polish the surfaces. On the machines with open-ended drums a "sieve cap" could be placed over the opening and the barrel tilted so that the tumbling medium and fine residue could be separated from the cleaned castings.

If the castings were only rusty or oily, they could be cleaned in the same machine with sawdust (hard maple preferred) as the tumbling medium. This would be necessary, for example, if castings had been stored for a time before being used to assemble banks. When the castings were fairly clean and the object was only to polish them, leather scrap was used as the tumbling medium.

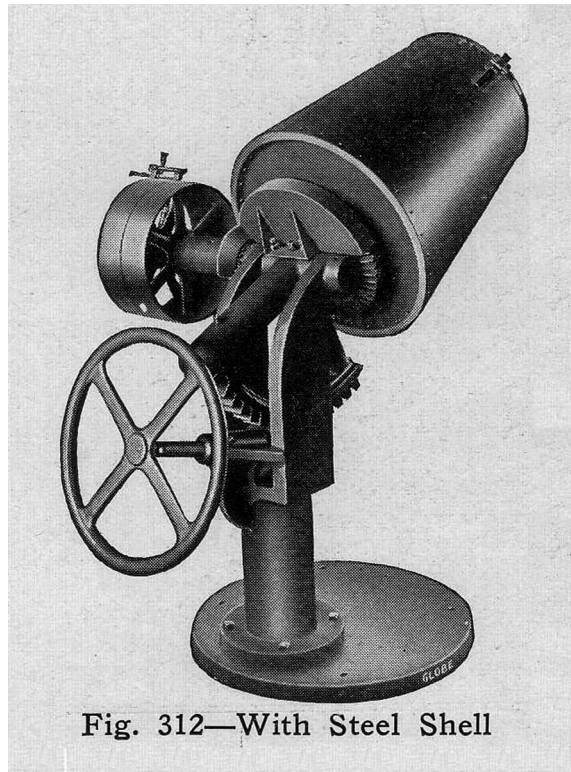


Figure 2. Illustration from the S. Obermayer Co., catalog.⁶ The hand wheel allowed the barrel of the tumbler to be tilted. The pulley would be connected by a flat belt to the source of power.

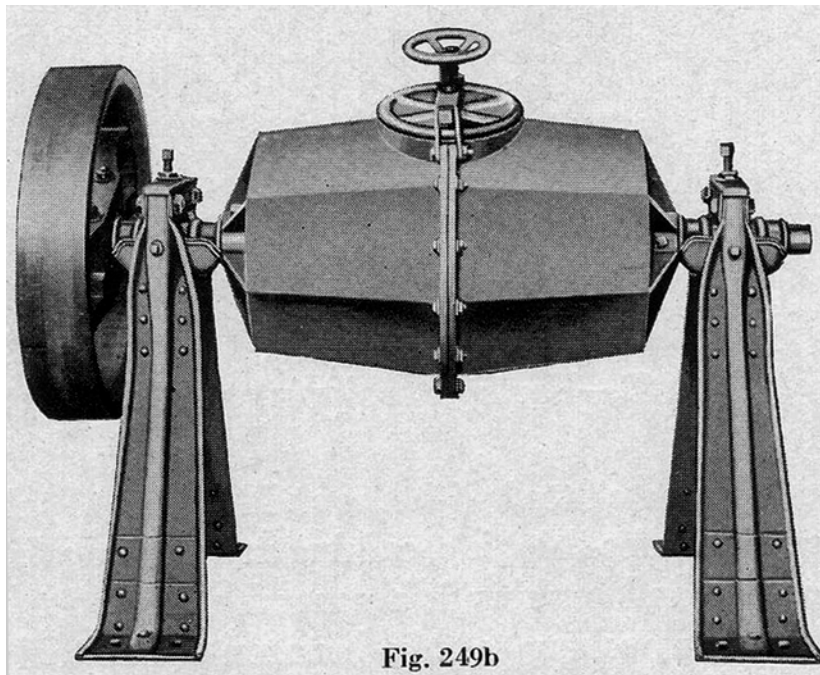


Figure 3. Illustration from E. J. Woodison Company catalog p. 249. This Horizontal Tumbling Barrel with tapered a hexagonal cross-section was available with barrel lengths of 18 to 30 inches.

Two shapes of hard iron stars were used: five or six point. The former are more-or-less flat, whereas the six point stars have a spherically symmetrical shape. *"For flat surfaced castings...use a five-point star. They clean, polish and finish... Combined with six point sharp stars, they not only smooth the flat surfaces, but get into the crevices and corners, leaving the castings in excellent condition for machining or the final finish."*⁷

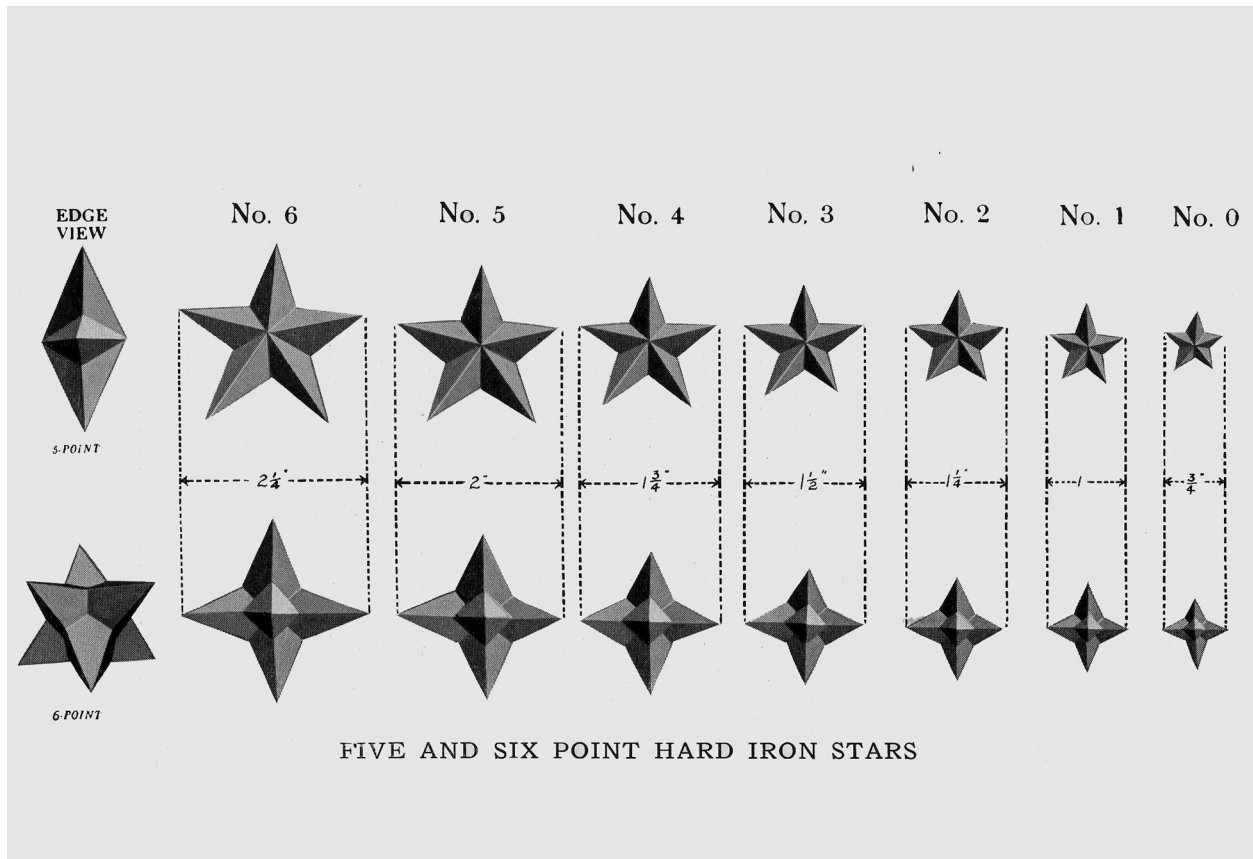


Figure 4. Illustration from the S. Obermayer Co., catalog p. 144. Note that the stars were molded of "hard iron," which means that they were harder than the "soft iron" used for the bank castings.

Notice the resemblance of the six point star to toy "jacks." Perhaps the game originated from a foundryman giving a few of the worn stars to his child. (Stars with rounded points would no longer be useful for cleaning castings and would not be painful to handle.)

Figure 5 shows the Tumbling Shop at the Kenton Hardware Co. in 1913. Here the tumbling barrels had a simpler design than shown in Figures 2 and 3, but they operated on the same principle and would have been no less effective.

D. IMPLICATIONS FOR AUTHENTICITY

An understanding of the process by which castings were cleaned and prepared for assembly can be used when evaluating cast iron banks. According to Haber, new castings were processed in the sequence: grinding then tumbling. In this case grinding marks should be somewhat softened

during the tumbling step.⁸ He was suspicious of the authenticity of a casting if the grinding lines were too sharp.



Figure 5. Tumbling Shop of the Kenton Hardware Co. in 1913. To the far left (only partially in photo) are two tumbling barrels that were loaded from the ends and rode on two rotating shafts. At far right workers are separating parts from tumbling stars. Notice how bright the parts appear. Photo provided by Robert Saylor.

Haber also notes⁷ that: *"A file was never used in the course of this operation, nor at any other time in the processing of the casting... The use of emery cloth or any other smoothing agent was never used in legitimate production, and microscopic examination of a casting which presents to view, such maltreatment, may be regarded as not genuine and of suspicious origin. Production methods did not permit the use of such laborious customs, and the process of tumbling was the only procedure employed to produce a smooth surface on all castings... File marks on any portion of a bank, within or without, immediately places it under suspicion."*

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References

¹ Fritz Kokesh, "Patterns and the Molding of Cast Iron Banks, Seminar by Bill Robison," *Penny Bank Post*, April 2003, p.5.

² John L. Mahon, personal communication, September 19, 2004.

³ The use of agate balls as the tumbling medium is not mentioned by any of the texts consulted for this article.

⁴ Mark Haber, "Foundry Practices at the J. & E. Stevens Co. During the 1880's," Lecture delivered at the fifth Annual convention of Mechanical Bank Collectors of America, Valley Forge, Pa., September 15, 1962.

⁵ The E. J. Woodison Company, "A complete Catalog of Foundry, Platers' and Polishers' Supplies and Equipment, Fire Brick and Refractory Materials," 1912 or later (photo of Seattle branch office on p. 9 shows 48-star U.S. flag displayed), p. 247.

⁶ The S. Obermayer Co., "Manufacturers, Everything You Need in Your Foundry," General Catalog No. 51, undated, 1924 or later (on p. 13 is a Dec 2, 1924 patent date), p. 226.

⁷ Woodison, p. 245.

⁸ Mark Haber, "Fakes, Deviations and Recasts and Methods of Detection," Lecture delivered at the sixth Annual convention of Mechanical Bank Collectors of America, Greenwich, Conn., September 21, 1963.