

H. I., P. F., & E. D. CHASE.

GRAIN-CONVEYER SHAFT.

No. 170,711.

Patented Dec. 7, 1875.

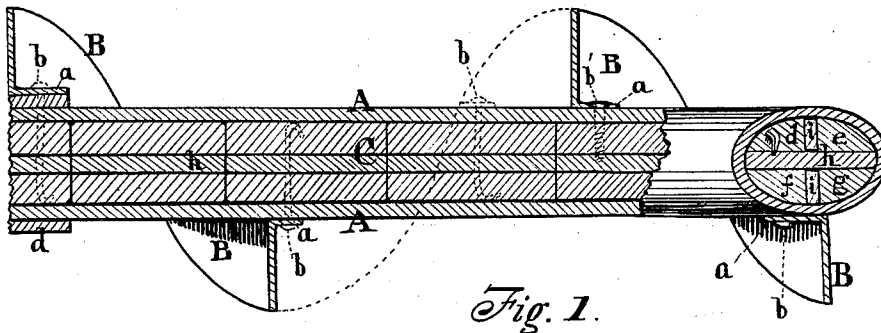


Fig. 1.

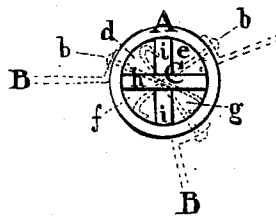
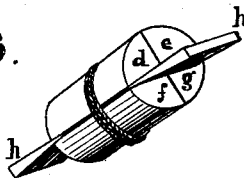


Fig. 2.

(A cross-sec. of Shaft, or end-view)

Fig. 3.
(Wood core "plug")



Witnesses
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UNITED STATES PATENT OFFICE.

HENRY I. CHASE, PHILANDER F. CHASE, AND EDWIN D. CHASE, OF
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IMPROVEMENT IN GRAIN-CONVEYER SHAFTS.

Specification forming part of Letters Patent No. **170,711**, dated December 7, 1875; application filed
November 9, 1875.

To all whom it may concern:

Be it known that we, HENRY I. CHASE, PHILANDER F. CHASE, and EDWIN D. CHASE, all of the city of Peoria, in the county of Peoria, in the State of Illinois, have invented an Improved Grain-Conveyer Shaft; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the annexed drawings, making a part of this specification, in which like letters of reference refer to like parts, and in which—

Figure 1 represents a longitudinal section; Fig. 2, a cross-section; Fig. 3, perspective view of section of core.

This invention consists in filling the hollow shaft, (used for constructing grain-conveyers,) as gas-pipe, boiler-flues, or other metal piping, of a size suitable for the purpose, with a solid wooden filling or core to strengthen or stiffen the same, and also for the purpose of affording an easier and more solid means of fastening the flights to the shaft by the use of a longer inserted fastening than the thinness of the shell of the pipe *per se* would admit of—as, for instance, a longer nail, spike, or screw. The short screws passing merely into the iron of the pipe were found to tear out when stress occurred, by reason of possessing so short a hold, at the same time destroying the tapped thread in the pipe, and incurring the necessity of retapping or boring a fresh hole.

The pieces of wood used to fill the shaft are turned round to fit the interior, and are then cut into short lengths of about six inches each. Each piece is split into quarters, through the center longitudinally, kept together, and tied in a bunch with string, with a wedge inserted into each end of a bunch, which bunch or split cylinder is then introduced into the pipe, and the wedges driven home. The insertion of a fresh split cylinder of wood in the same manner drives that already introduced before it until the pipe or shaft is filled, the wedges cutting each other at a right angle, and compressing the blocks of which each bunch is formed compactly in the pipe, filling it solidly. The blocks and wedges are better driven, and are preserved, by dipping one or the other, or both blocks and wedges, in tar or similar lubricant or preservative. The shafts are made

in about sixteen-foot lengths, coupled together by a gudgeon inserted in the ends of the shaft, where they are secured by bolts or rivets. Each end of the pipe is bound by an iron band secured by a thread or similar detent, to strengthen the shaft at the gudgeon-connections, to prevent the latter from being torn out when heavily worked with grain. We also fill the pipe in other modes with wood, but the plan described is the most practicable. The flights may be bolted, screwed, spiked, or nailed onto shaft when filled, as preferred; but it will be found that spikes or long nails afford nearly as solid and firm a hold as the screws, as the former, on reaching the opposite side of the pipe, and encountering the same, will be caused to bend and clinch themselves, and thus prevent withdrawal unless subjected to extraordinary stress. The wooden core forms a solid nucleus for the retention, too, of the screws, as a much longer one can be utilized here than where its bearing is only in the mere thickness of the shell of the pipe or hollow shaft.

In the drawings, A represents the hollow shaft; *d*, the band or ferrule used to strengthen each end of the section of a shaft; B, the flights, made continuous, and provided with the lugs *a a*, &c., each pierced with a hole for admission of a screw, *b'*, or nail *b*, which passes through a similar hole in the shaft into the wooden core; C, the wooden core or stiffening, composed of the split sections *d e f g* and the wedges *h i*, &c.

The advantages of this shaft are as follows: First, the wooden core greatly stiffens the hollow shaft, preventing it from springing or bending. Second, the wooden core allows of the use of a smaller shaft, and a consequent larger capacity for grain between the flights, thus reducing the weight of the shaft and cost of material. Third, it affords a more easy and quick means, and more permanent attachment of the flights to the shaft, as the tapping of the iron shaft may be dispensed with, and allow the use of a longer screw, *b'*, with a much longer thread than the ordinary screws so used in such shafts not filled with wood. Nails, too, form an equally good means for attaching the flights, for the latter, as before ex-

plained, will clinch themselves on reaching the opposite side of the shaft. Fourth, in case of damage incident to the flights, as tearing off the same, this plan presents great facility for reattachment of new flights without the necessity of retapping the thread in the iron pipe or shaft, relied upon for the retention of the short attaching-screws of the old plan, and the trouble of driving out the broken screws, and retapping the hole.

What we claim as our invention is—

1. The hollow iron conveyer-shaft A, filled with a core of wood, C, or like substance, to strengthen the same, and form a solid basis for the nails or screws which secure the flights to the shaft, substantially as and for the purposes described.

2. The combination, with the filled shaft A, of the iron band or ferrule *d* at either end of a shaft-section, applied and operating substantially as and for the purposes described.

3. The combination of the hollow conveyer-shaft A, wooden core C, made in sections *d e f g*, and ferrule *d*, arranged and operating substantially as and for the purposes described.

4. The wooden core-sections *d e f g*, split twice longitudinally through the center at or near a right angle to each other, and filled with wooden wedges *h i*, combined together with the pipe A, substantially and operating as and for the purposes set forth.

In testimony that we claim the foregoing improvement in grain-conveyer shafts we have hereunto set our hands this 22d day of October, A. D. 1875.

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PHILANDER F. CHASE.
EDWIN D. CHASE.

Witnesses:

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