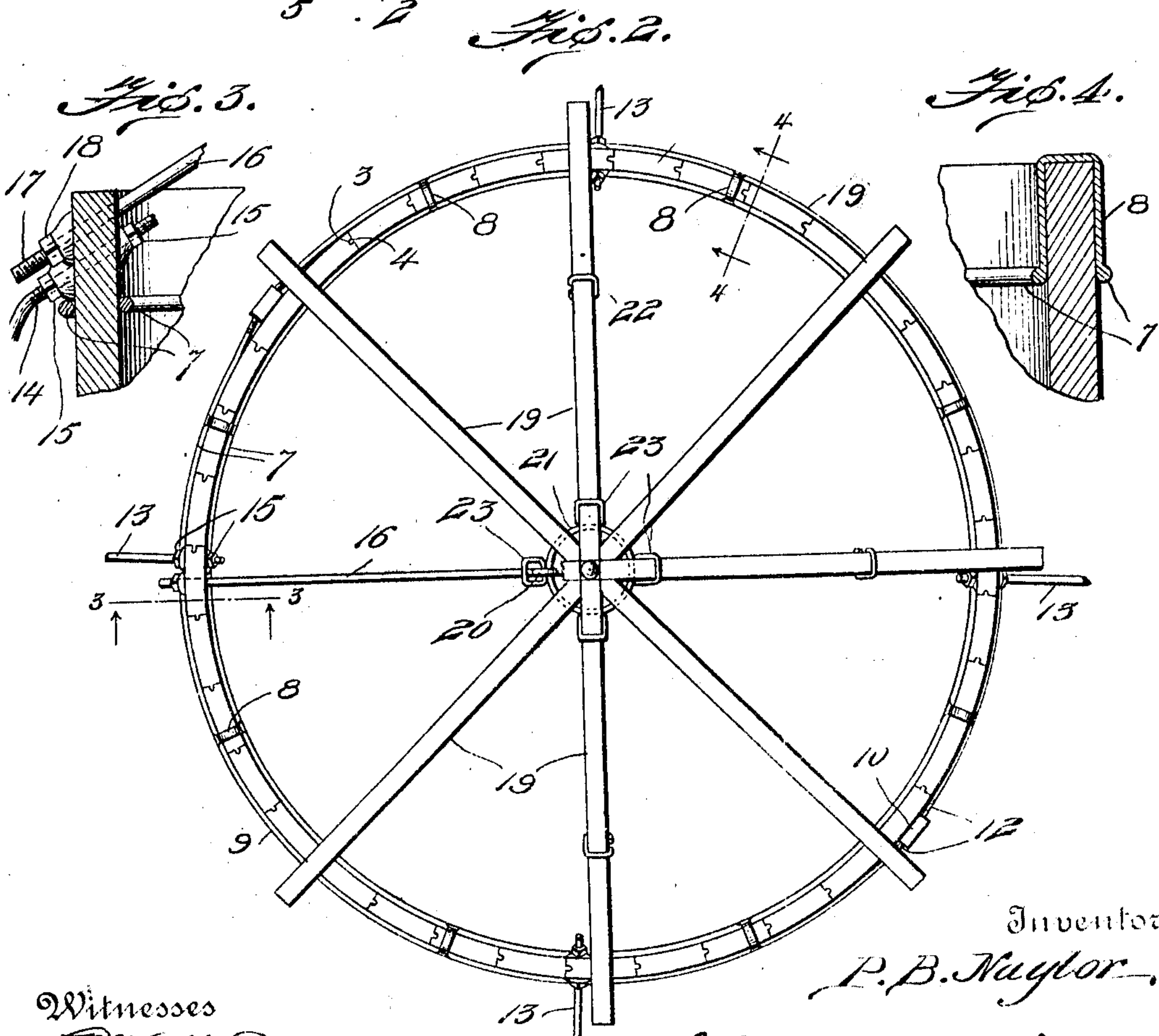
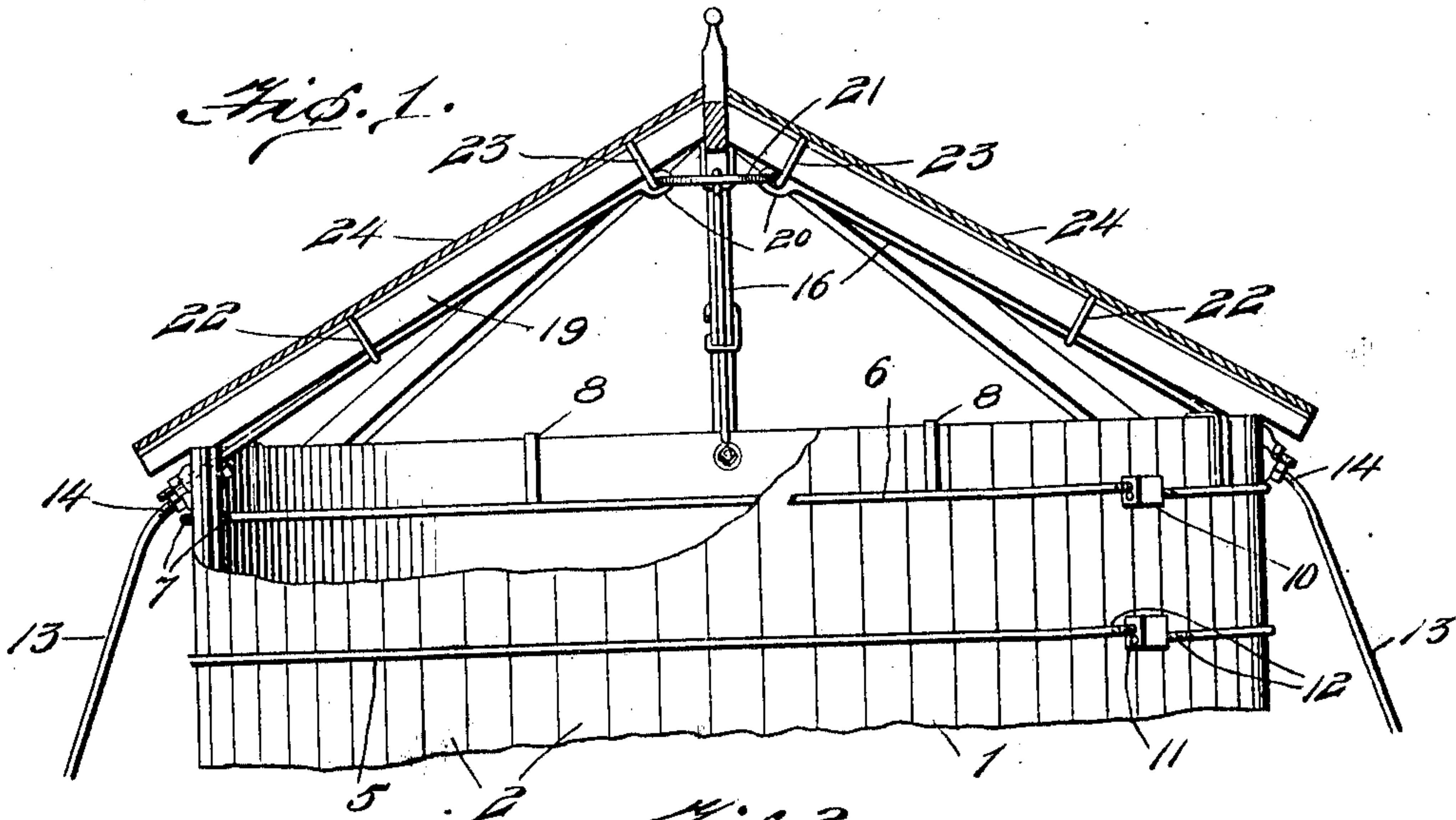


P. B. NAYLOR.
REINFORCING MEANS FOR SILOS.
APPLICATION FILED JUNE 23, 1910.

Patented Apr. 4, 1911.

988,731.



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UNITED STATES PATENT OFFICE.

PAUL B. NAYLOR, OF KANSAS CITY, MISSOURI.

REINFORCING MEANS FOR SILOS.

988,731.

Specification of Letters Patent.

Patented Apr. 4, 1911.

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To all whom it may concern:

Be it known that I, PAUL B. NAYLOR, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Reinforcing Means for Silos; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to reinforcing means for silos, and especially to means for securely fastening and bracing the roof and the upper portion of the silo.

One object of my invention is to provide novel and efficient means for reinforcing the top of the silo staves and always retain the same in position without regard to the contraction and expansion of the staves under the influence of the various climatic changes encountered.

Another object of my invention is to provide means for bracing the roof and silo top and for connecting the silo roof to the upper end of the body portion of the silo.

With these and other objects in view, the invention consists of certain novel features of construction, combination and arrangement of parts as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a side elevation of the upper portion of a silo equipped with my improved reinforcing means parts being broken away and in section. Fig. 2 is a plan view of the silo with the roof sections removed. Fig. 3 is a detail sectional view on the line 3—3 of Fig. 2, and Fig. 4 is an enlarged detail view of a portion of the reinforcing means.

Like reference numerals indicate corresponding parts throughout the several views.

Referring to the drawings, which are for illustrative purposes only and therefore are not drawn to scale, the numeral 1 represents the upper portion of a silo of the usual or any desired shape and size, and constructed of a plurality of staves 2 having suitable grooves 3 and tongues 4 adapted to cooperate to retain the staves in a closed or airtight position. To prevent the accidental displacement of the staves 2, I provide a plurality of annular reinforcing members 5 at various intervals along the body portion of the silo, these members being preferably

of the form illustrated and described in my co-pending application Serial Number 538481, filed Jan. 17, 1910.

At the upper extremity of the body portion of the silo I provide a top-reinforcing member 6, comprising inner and outer sections 7 concentrically arranged and connected together by U-shape yokes or hangers 8, which are adapted to fit over the top of the silo staves and engage the top and sides thereof, substantially as indicated in Fig. 2. This top-reinforcing member is preferably adjustable, and as herein shown each section 7 is constructed of a plurality of pieces 9 adapted to be coupled together by means of the connecting blocks 10, the latter being formed with longitudinal threaded openings 11 adapted to receive the threaded end portions 12 of the pieces 9. Owing to this construction, I am enabled to adjust my top-reinforcing member to closely engage the inner and outer sides of the silo staves, and in such adjustable position the member serves to prevent the expansion of the silo staves, strengthens them, and retains them in their normal position.

A plurality of anchoring rods 13 are suitably secured at their lower extremities adjacent the ground, and at their upper extremities are threaded, as at 14. These rods 13 extend through the silo staves near the upper ends thereof, and are secured in this position by means of clamping nuts 15 threaded upon the anchoring rods. The upper ends of the anchoring rods 13, as herein shown, extend through the silo staves above the top-reinforcing ring 6 or between said ring and the top of the staves, thereby serving to prevent the accidental removal or dislocation of this reinforcing ring.

My roof-bracing or securing means preferably comprises a plurality of radially-disposed inclined rods 16 having their lower extremities threaded, as at 17, and extended through the upper portion of the staves 2 between the reinforcing ring 6 and the top of the staves, the said threaded extremities 17 being secured in this position by means of clamping nuts 18 threaded upon the rods. The rods 16 are adapted to extend along the rafters 19 of the silo roof, and at their upper extremities are provided with eyes or hooks 20, by means of which said rods are connected to a supporting and connecting ring 21 arranged near the apex of the silo roof. Hangers 22 suitably secured upon the raft-

ers 19 are adapted to support the rods 16, while a plurality of links 23 surrounding the rafters 19 are adapted to extend through the eyes 20 at the upper extremities of the rods 16.

As clearly shown in Fig. 2, the connecting ring 21 passes through each of the eyes 20 upon the rods 16 and joins the rods and the rafters together to strengthen and integrate the same. The sections or shingles 24 are suitably secured upon the rafters 19 by shingling nails or other suitable securing means.

It will be apparent from the above description that I have provided means to reinforce the tops of the silo staves and also connect the reinforced upper portion with the roof-supporting frame, thus enabling the roof and body portion of the silo to cooperate to brace and retain the various sections in their normal position. Means are also provided by which the reinforced upper portion of the staves may be suitably braced or anchored from the ground, and these bracing means have been utilized to assist in retaining in position the reinforcing means for the upper portions of the silo staves.

From the foregoing description taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention as defined in the appended claims.

Having described my invention, I claim:

1. A reinforcing means for silos, comprising a member adapted to embrace the upper ends of the silo staves, said member being formed with inner and outer sections connected by a substantially U-shaped yoke.

2. A reinforcing means for silos, comprising a member adapted to embrace the upper ends of the silo staves, said member compris-

ing inner and outer sections connected by a U-shaped yoke each section being composed of pieces, and means for adjustably connecting said pieces.

3. The combination with a silo, of means for reinforcing the same, comprising a member adapted to embrace the upper ends of the silo staves, a plurality of radially-disposed rods connected at one end to the upper portion of the staves, means for connecting the other ends of said rods, and means for supporting said rods from the silo roof.

4. The combination with a silo, of means for reinforcing the same, comprising a member adapted to embrace the upper ends of the silo staves, anchoring rods secured at their lower extremities adjacent the ground, and at their upper extremities to the silo staves between said member and the upper ends of the staves, roof-supporting rods secured at one end to the silo staves between said member and the upper ends of said staves, means for connecting the opposite ends of said roof supporting rods, and means for connecting said roof supporting rods to the silo roof.

5. The combination with a silo having a side wall, of staves and rafters supporting its roof, of a member to reinforce the upper ends of the staves, said member having inner and outer sections connected by a U-shaped hanger, a plurality of radially disposed rods secured at their outer ends to the upper portions of the staves, said rods being provided at their inner ends with eyes, a connecting ring adapted to extend through all of said eyes, hangers connecting said eyes to the rafters, and other hangers connecting the intermediate portions of said rods to the rafters.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

PAUL B. NAYLOR.

Witnesses:

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