

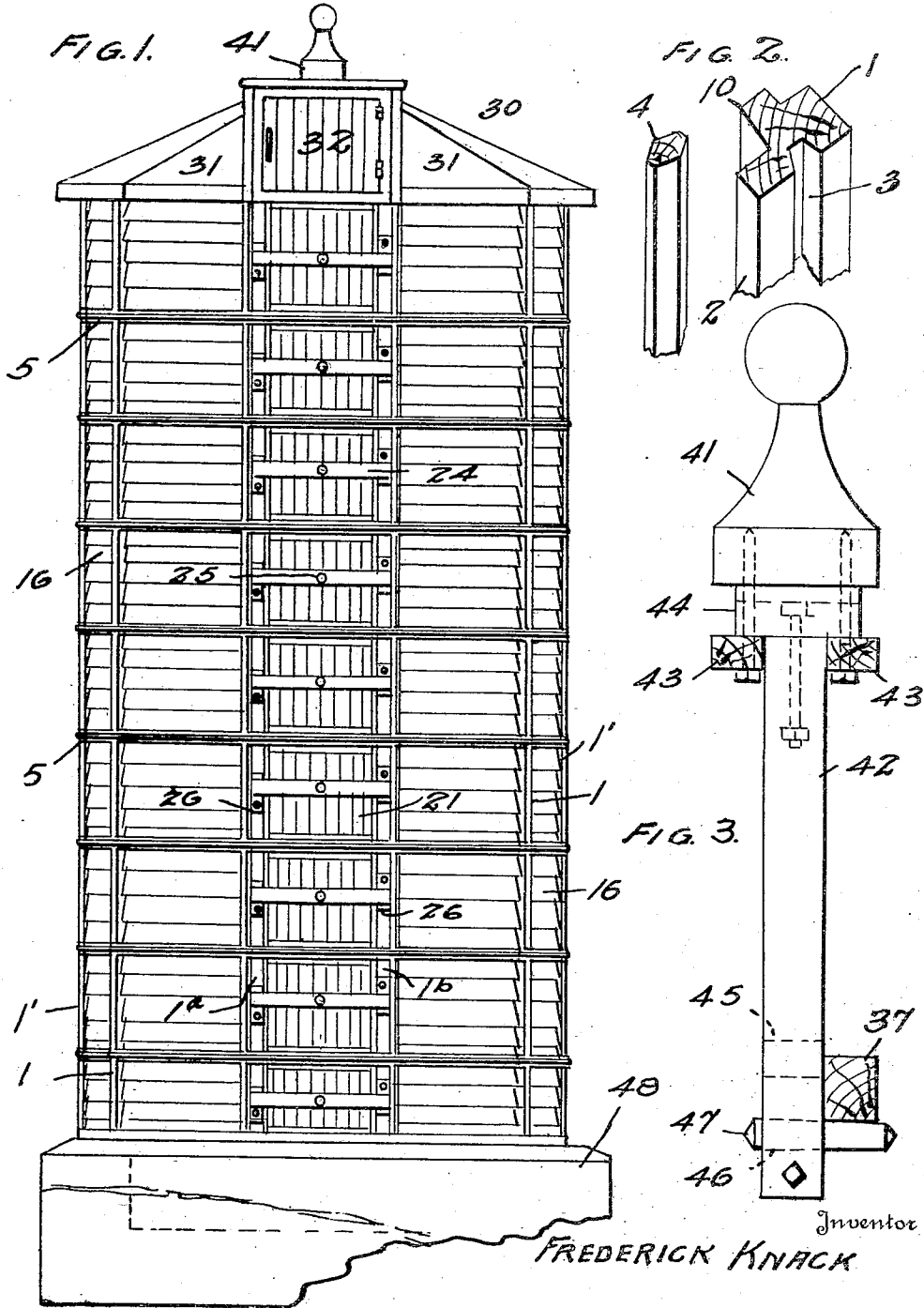
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SILO.

APPLICATION FILED OCT. 13, 1916. RENEWED SEPT. 19, 1917.

1.246,281.

Patented Nov. 13, 1917.

3 SHEETS—SHEET 1.



Inventor

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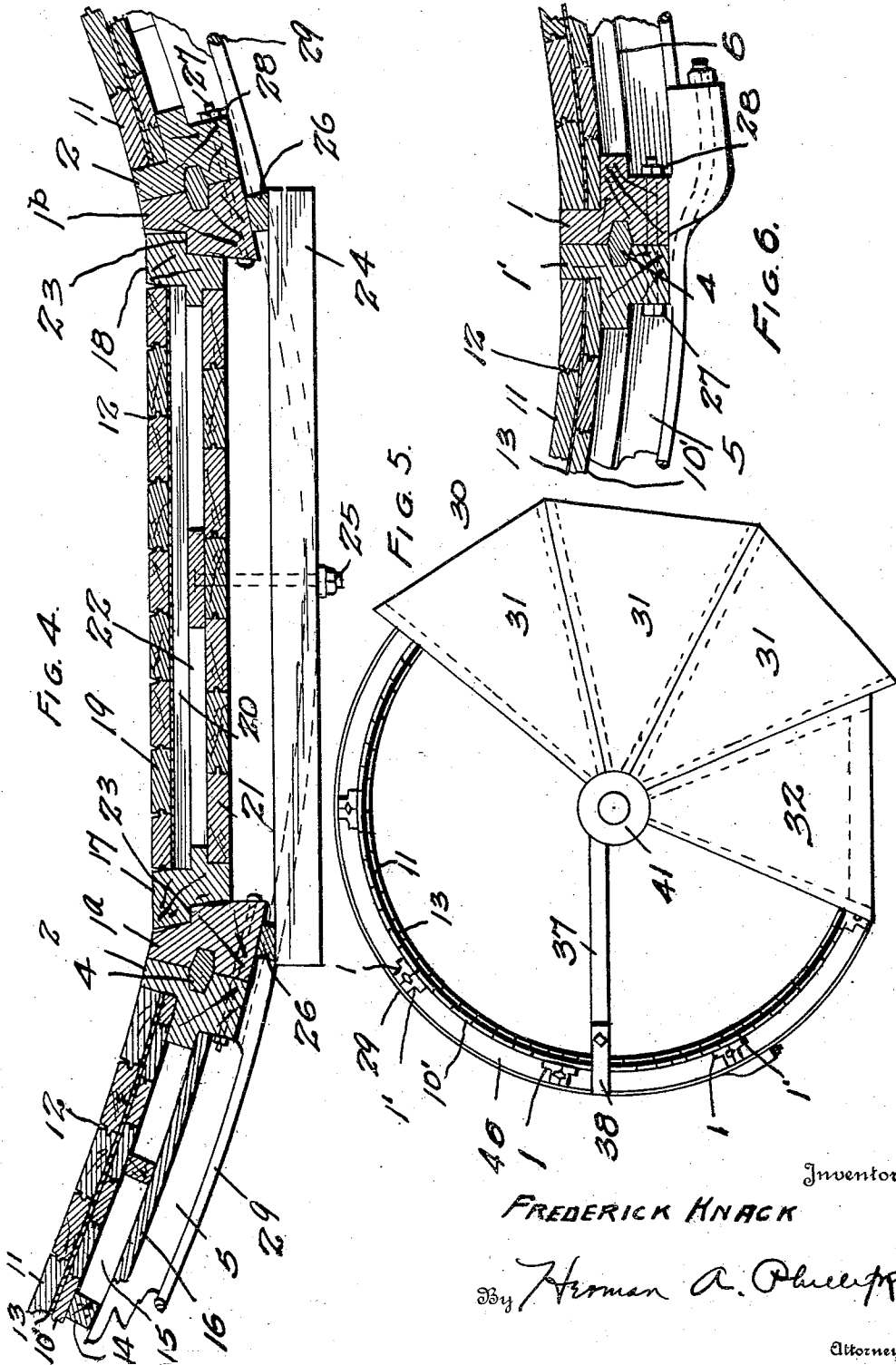
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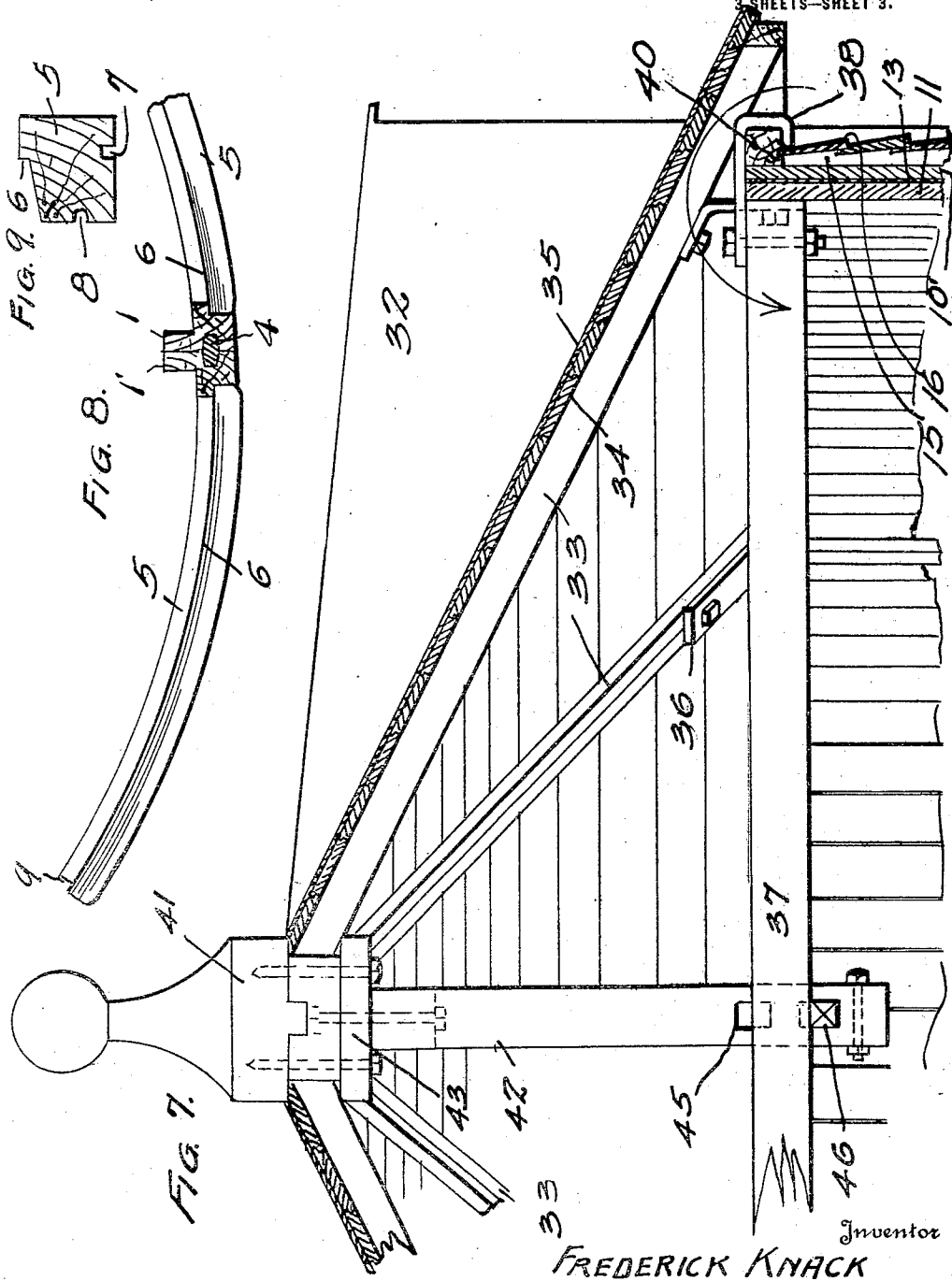
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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SILO.

1,246,281.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, FREDERICK KNACK, a citizen of the United States of America, residing at Hoquiam, in the county of Grays Harbor and State of Washington, have invented a new and useful Improvement in Silos, of which the following is a specification.

My invention relates to improvements in silos, and is designed primarily for the purpose of providing a silo structure which may be erected with facility, is perfectly water tight, well ventilated, strong and durable, and not likely to become deformed or misshapened in use.

The invention consists in certain novel combinations and arrangements of parts whereby the silo may be assembled or erected by sections and rendered waterproof, and well ventilated, all as will be more fully described and claimed hereinafter.

In the accompanying drawings I have illustrated one complete example of the physical embodiment of my invention constructed according to the best mode I have so far devised for the practical application of the principles of my invention.

Figure 1 is a front elevation of a silo, with a portion of its foundation broken away, and embodying the novel features of my invention.

Fig. 2 illustrates one of the uprights or posts of a section, and one of the tongues used in conjunction with a pair of these posts.

Fig. 3 illustrates the center post and connections of the roof or cover for the silo.

Fig. 4 is an enlarged, horizontal sectional view taken through the doorway and door of the silo, showing adjoining parts.

Fig. 5 is a top plan view of the silo, showing a portion of the cover removed.

Fig. 6 is a sectional view showing a pair of posts and a joint between the rings or rods for holding the silo together.

Fig. 7 is an enlarged sectional view showing a portion of the cover of the silo, and showing the dormer in elevation.

Fig. 8 illustrates the relation between a pair of horizontal ribs and a dual post.

Fig. 9 is a vertical sectional view through one of the horizontal ribs.

In the preferred embodiment of my invention, as illustrated in the drawings, the silo is cylindrical in form, and made up of eight sections and an additional section

forming the doorway. Each of these eight sections comprises a pair of posts as 1 and 1', which are preferably of wood, and formed with an extension or rib 2 and a groove 3. These posts extend the entire height of the silo, and are arranged in pairs, one at each end of a section, and the posts of adjoining sections, when the sections are erected, have their complementary grooves 3 filled by means of a long tongue 4 which also extends the height of the silo. But the sections are constructed before they are assembled.

In constructing the sections, I utilize a series of horizontal ribs indicated by the numeral 5, which are fastened at their ends to the posts 1 and 1', and spaced, say two feet apart, at regular intervals in the height of the silo. In Fig. 9, it will be seen that the rib 5 has at its upper surface a shoulder 6, and at its under surface a groove 7, and at its outer surface another groove 8, these grooves and the shoulder extending from end to end of the curved rib. The rib is bent to correspond to the diameter of the silo to be built, and the ends of the ribs are formed with shoulders 9 which engage a flange 10 on the posts 1 and 1'. The series of horizontally disposed ribs which are secured at their ends to the posts 1 and 1', together with the posts, form a rigid frame upon which the walls of the silo are built. These walls comprise, at their interior, two shells, the first made up of flooring, or tongue and groove boards 10', and the innermost shell is made up of tongue and groove flooring as indicated at 11. The flooring 11 is preferably thicker than the flooring 10', and it will be seen that the inner joints of the interior shell of the wall are spaced apart, or open, as indicated at 12. This open joint permits the wood to swell after the silo has been erected and ensilage placed therein, and at the same time prevents buckling or warping of the material. Preferably, I place a layer of paraffin paper as 13, between the two shells 10' and 11 to insure a water tight structure. The shells fit snugly in the corners between the ribs 2 and flanges 10 of the upright posts 1 and 1', and the shoulders 9 on the ribs 5 fit snugly against the flanges 10 of the posts, and thus securing a firm and rigid structure. Between the horizontal ribs are disposed a series of short vertical, horizontally spaced furring boards as 14, which extend from rib

to rib, and provide air spaces 15 in the wall. The outer shell of the silo wall is made up of horizontally disposed bevel siding boards or sheathing 16, which extend
5 from posts 1 to 1', and give to the silo the appearance as indicated in Fig. 1. The boards are curved to fit into groove 7, and the curving of these boards may be accomplished by steaming in the usual manner at
10 slight expense.

The boards which come in contact with the upper face of the horizontal ribs 5 are laid against the shoulders 6 on the ribs, and the boards which come against the underside of
15 these ribs have their upper edges inserted in the grooves 7 of the ribs, in both cases forming weather tight joints.

In Fig. 4, the door and doorway construction are illustrated. The door frame is formed by the pair of specially constructed posts 1^a and 1^b which are joined to their complementary posts by the tongue 4. Each door comprises a pair of shoulder side bars 17 and 18, and between these bars there are
25 three layers of tongue and groove boards, indicated as 19, 20 and 21. The boards 19 and 21 are arranged vertically, and the boards 20 extend horizontally, forming an air space 22 in the door. The side bars 17 and 18 of the door engage shoulders 23 on the posts 1^a and 1^b, and the door bar 24 which is pivoted at 25 to the center of the door, is utilized in conjunction with a pair of cam blocks or wedges 26 to lock the door
35 in position. These blocks 26 are secured to the outer face of the jambs or posts 1^a and 1^b of the doorway, and the door bar is swung upon its pivot 25 to engage the cam blocks. The doors are pulled between the jambs by the action of the cams, and are securely held in place. The top and bottom frame bars for the door are provided by the corresponding horizontal ribs, and the side bars or jambs of the door are formed by the upright
45 posts 1^a and 1^b.

In erecting the silo, after the individual sections have been built up, the sections are taken singly, and stood upon end with the double tongues 4 between adjoining uprights
50 or posts. The adjoining posts are preferably held together by means of bolts 27 and nuts 28, and when all of the sections have been placed in position they are bound together by means of the rods or hoops 29, which are
55 passed around the silo and are seated in the grooves 8 of the ribs 5. In this manner the sections are all held securely in position, and then the doors are placed in position and built up as readily understood.

The cover of the silo as indicated at 30, is pyramidal in shape and made up of eight panels 31 and the dormer 32. The panels comprise the usual rafters 33 and a ceiling of tongue and groove material 34, and this
65 boarding is covered with a canvas layer 35.

The cover or roof is supported from the silo, at its perimeter, by means of angle brackets 36 which are bolted to the rafters and also to the inner shell of the silo, and the cover is also held down to the silo by means of a
70 transversely arranged beam 37. This beam extends across the upper open end of the silo and at each end is provided with a metallic hook 38 bolted to the beam, and this hook engages over a rib 40 at the upper edge of
75 the silo. At the center of the cover I utilize a center block 41 at the head of the center post 42, the parts being joined together by the blocks 43 and intermediate block 44. This center block or cap forms the apex of the cover, to which the roof panels center, and the post 42 depends alongside the cross beam 37. Post 42 is slotted at 45 and 46 adjacent the beam 37 for the reception of a key or wedge 47. As shown in Figs. 3 and
85 7, the key is in position to lock and hold the roof down tight upon the beam. When it is desired to raise the roof or cover, the key is withdrawn, and placed in the slot 45. In Fig. 7, it will be seen by the arrow that the air space is formed at the upper edge of the silo where the cover projects beyond the silo walls, so that ventilation is provided for.

In erecting the silo, the parts are suitably braced until they have all been securely
95 locked and fastened together, and should it be necessary to knock down the silo, this may be accomplished with equal facility. The flooring or tongue and groove boards are preferably put together with white lead
100 or linseed oil, and the furring which provides the air spaces and the bevel siding on the outside of the wall are designed to protect the inner shells of the wall. The door sections are of course water tight and the
105 cross bars on the doors serve as a ladder, as is usual in silos of this type. Preferably, the canvas cover of the roof and dormer is provided with two coats of paint, and the dormer itself may be placed in any of the
110 panels of the cover, as the panels are all of the same size and may be displaced to accommodate the dormer.

The silo is preferably supported upon a concrete base 48, by the utilization of iron
115 anchors in usual manner, and preferably an asphalt ring, not shown, is utilized around the lower outside edge of the silo.

From the above description taken in connection with my drawings, it is apparent that I have provided a silo which fulfils
120 the objects and purposes of my invention.

What I claim is:

1. A silo section comprising a pair of spaced, grooved posts, each formed with a
125 flange and a rib extending throughout its height, a series of horizontal ribs connected to the posts and engaging the flanges, each horizontal rib having a shoulder on its upper face and a groove on its under face, an inner
130

layer of vertically extending boards with the end boards secured between the flange and rib, and an outer layer of horizontal boards between the ribs, the uppermost board between adjoining ribs being seated in a groove in a rib, and the lowermost board having its edge engaging against said shoulder.

2. A section of a silo comprising vertical posts and horizontal ribs connected to the posts, an inner layer of tongue and groove boards, an outer layer of tongue and groove boards with a lining of paper between said layers, furring strips on the outer side of the outer layer forming air spaces, and hori-

zontal sheathing boards at the outer side of said section.

3. A silo section comprising spaced posts and horizontal ribs, said ribs each having a shoulder on its upper face and a groove on its lower face, an inner shell forming a portion of the wall of the section, and horizontally disposed boards forming the outer shell of the wall, the uppermost parallel boards between the ribs having their upper edges in said grooves, and the lowermost boards having their lower edges engaging said shoulders.

In testimony whereof I affix my signature.
FREDERICK KNACK.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."