March 19, 1929. A. J. HARTLEY 1,705,478

GRAIN ELEVATOR

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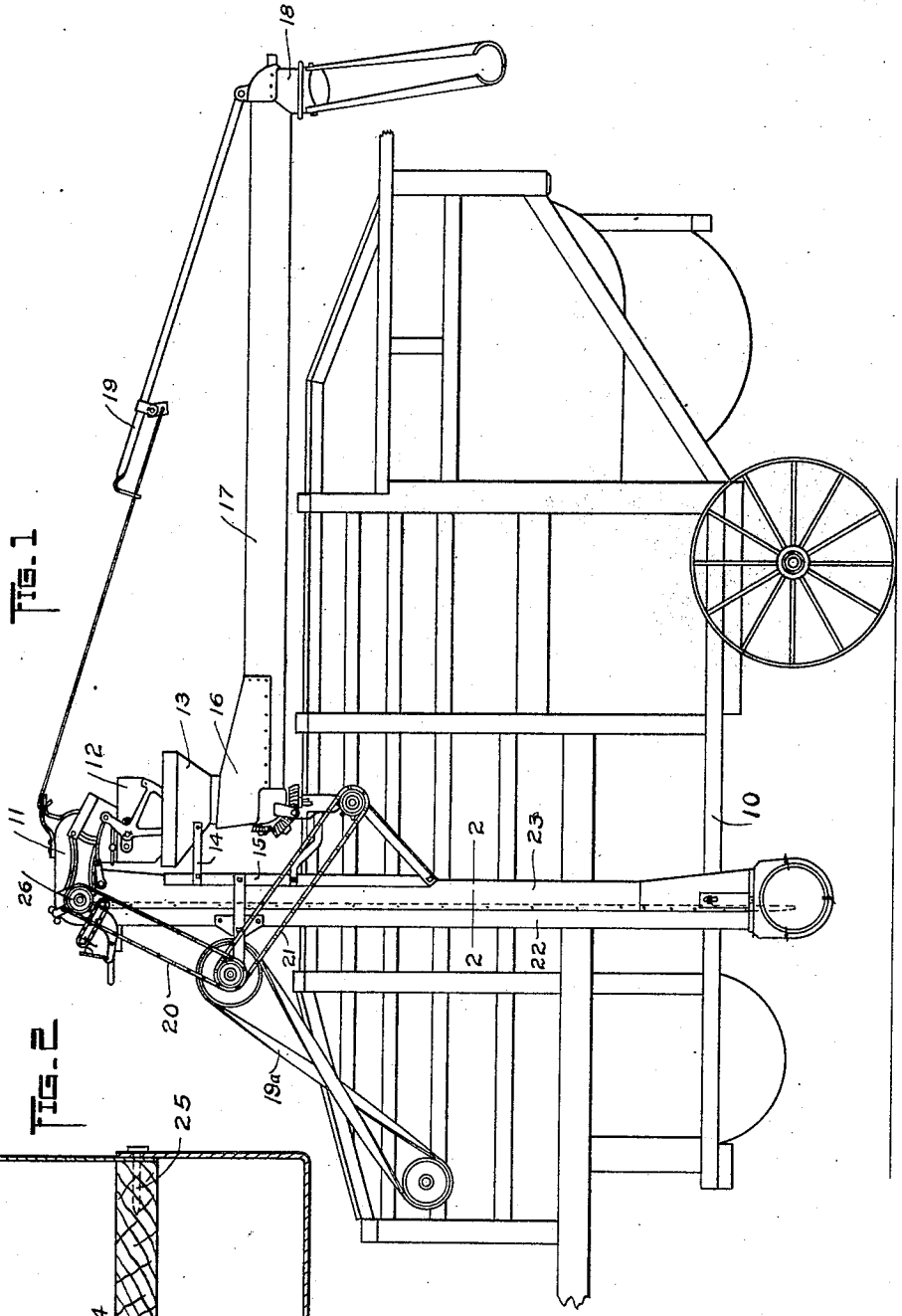


FIG. 1

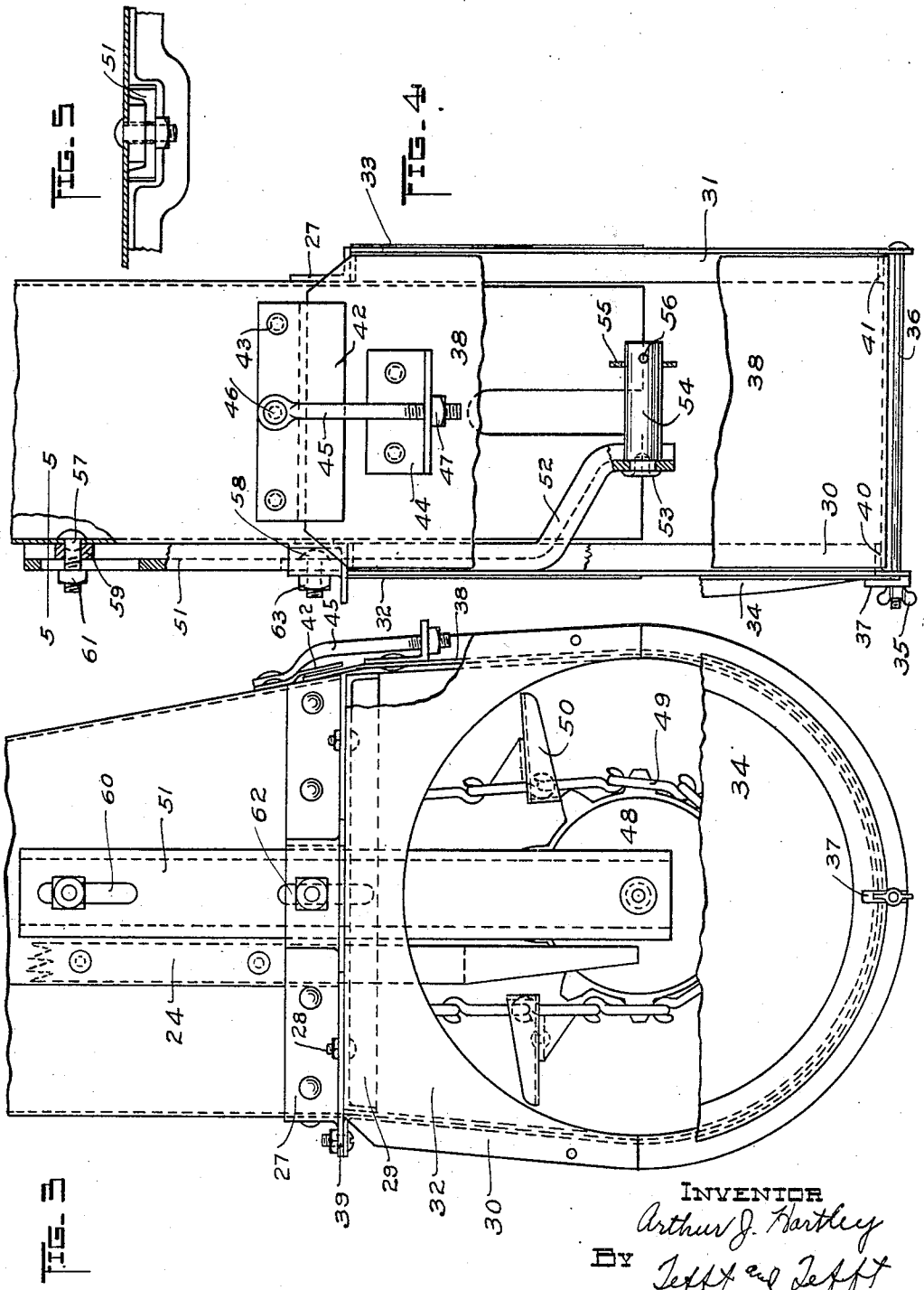
FIG. 2

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UNITED STATES PATENT OFFICE.

ARTHUR J. HARTLEY, OF PEORIA, ILLINOIS.

GRAIN ELEVATOR.

Application filed October 30, 1926. Serial No. 145,227.

This invention relates to grain elevators.

One of the objects of the invention is in the provision of a grain elevator fashioned in a manner to present an all metal exterior, the same being of simple construction but combining therewith the feature of increased strength and added utility.

Another object thereof is in the provision of grain elevating mechanism having its outer section formed of two metal sections, the same having their adjacent edge portions overlapped in such manner that the connecting means may also engage a wooden interior portion that divides the outer section into two distinct parts, namely the grain elevating side and the return portion for the grain elevating mechanism.

Yet another object is in the method of fashioning the housing portion of an elevating mechanism, whereby an all metal exterior is presented, said housing being attached in a simple manner to a wooden divider portion with the result that not only a simple and inexpensive elevator section is provided, but also one having the advantage of greatly increased strength and ease of manufacture.

Still another object lies in the provision of mechanism for adjusting the endless chain elevating mechanism disposed within the elevator section, said adjustable mechanism being disposed exteriorly of the elevator and in such position as to obviate the usual necessity of entering the elevator section to adjust the endless chain.

A further object is in the construction of a special boot member for the elevator section, said boot member including a readily attached and quickly removable band and cover member surrounding the main hopper portion, said quick detachable band and cover permitting ready entrance to the interior of the elevator section or boot portion in case of the necessity of service.

Other objects of the invention will appear in the following specification, taken in connection with the annexed drawings, in which—

Fig. 1 is an elevational view showing generally my elevator section attached to a threshing machine and in operative engagement therewith.

Fig. 2 is a cross-sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is an enlarged detail, partially in section, of the boot portion of the elevator, the same being shown in side elevation;

Fig. 4 is an end elevation of Fig. 3, portions thereof being cut away for a more detail view of the mechanism for adjusting the endless chain or grain elevating mechanism; and

Fig. 5 is a cross-sectional view taken on the line 5—5 of Fig. 4, the same showing more in detail a portion of the adjustable mechanism for the endless chain.

Referring to the drawings, there is shown in Fig. 1 the general assembly of the grain elevating mechanism in connection with a threshing machine.

Although the present application is directed specifically to the grain elevating portion, per se, nevertheless said view includes a showing of such auxiliary mechanism as ordinarily used in connection with the before mentioned grain elevator.

In the present instance, the grain elevating member, the same to be later described in detail, is suitably supported upon the side of a threshing machine, the same being designated 10. Suitably attached in any well known manner to the delivery end 11 of the present grain elevator is the well known grain weigher 12, the same delivering into a hopper 13 of usual construction, said hopper being suitably supported by means of the brackets 14, engaging angle irons 15 attached to the elevator section. The hopper 13 again delivers into the receiving end 16 of a power conveyor 17 of conventional design, said power conveyor finally delivering the grain from its delivery end 18. A manually operated mechanism 19 is provided for raising and lowering the power conveyor, said mechanism being attached at one end to the delivery end of the grain elevator and at its opposite end to the delivery end of the power conveyor. Means for driving the elevator, grain weigher and power conveyor includes a main belt drive 19^a from the threshing machine. From pulleys rotated by said belt 19^a, power is transmitted through chains 20 and 21 to the elevating mechanism in the grain elevator, and also to the power conveyor, all of said driving connections being of well known construction.

As stated before, the present application is directed mainly to the grain elevator itself. In the present instance, the housing for the grain elevator comprises two metal sections designated 22 and 23 respectively. These metal sections are fashioned in the manner shown in Fig. 2, with the edge por-

tions of section 22 overlapped by the opposed edges of metal section 23. The final connection between these two sections is accomplished by disposing the wooden divider member 24 in such manner with respect to the overlapping edges of the two metal sections, as to permit a single attachment member or plurality of attachment members 25 to engage at one time the overlapping edges of the metal sections and the edge of the wooden divider member. It is obvious that the plurality of attachment members 25 completes the final connection at various points along the edges thereof between the overlapping metal sections and the interior wooden divider.

It may be seen from the above that an elevator section of simple construction is provided, the method of constructing same permitting quickness of manufacture, the presentation of an all metal exterior, as well as an increase in strength over elevator sections heretofore known and including the presentation of a partial wooden interior.

The elevator section above described is adapted to have attached thereto at the upper end the before-mentioned delivery portion or head 11, the same being connected in the well known manner, and including a conventional sprocket member, not shown, driven by sprocket 26, which is in turn driven by the belt 20.

At the lower end of the above described elevator section is securely riveted a strengthening and supporting angle 27 surrounding three sides of the elevator section, as clearly shown in Figs. 3 and 4 of the drawings. Secured by means of a plurality of bolts 28 to said member 27 are the angle irons 29, to which are welded the framing members 30 and 31 for the elevator boot portion. These members 30 and 31 are the skeleton framing for the covering members of the boot portion. One side of the boot member remains open, with the exception of a metal plate 32 that covers the upper end thereof in a manner to present a complete circular opening, the latter coinciding with the grain delivery portino of the threshing machine, not shown. The opposite side of the boot has a similar plate 33, securely attached in a like manner to the skeleton frame 31.

However, there is left open in a similar manner, a complete circular aperture opening directly into the elevator boot. This opening is closed by a removable cover 34, which is held in fixed position by means of several clamps 37, which are held in operative position by wing nuts 35, screw threaded upon bolt members 36 which engage the skeleton frames 30 and 31. It is readily apparent that by loosening the wing nuts 35, the clamps 37 will release the cover 34, so that it may be quickly detached. The detachable feature of this cover member permits ready entrance into the boot in case of clogging or necessity of service and therefore contributes greatly to the efficiency of the grain elevator in the field.

To complete the enclosure of the boot portion, a band 38 of sufficiently flexible metal is securely attached, as at 39, at one end to the angle iron support 27, said metal band extending entirely around the boot and fitting closely the inwardly projecting edges 40 and 41 of the skeleton angle iron frames 30 and 31, said metal band 38 finally extending beneath an overlapping portion 42 riveted as at 43 to the elevator section. Secured to this loose end of the metal band 38 is a bracket 44, the same being apertured to receive a bolt 45 that is attached at 46 to the overlapping member 42. This bolt is adapted to project through the aperture in the bracket 44, and to have threaded upon its projecting end the nut 47, which holds the metal band 38 tightly upon the angle iron frames 30 and 31 and in such manner as to prevent the exit of grain from the boot.

Again, we find a covering for the boot which may be quickly removed, at least the loose end thereof may be disengaged to permit ready entrance into the boot in case of congestion or the necessity of repair to the grain elevating mechanism. We find, therefore, not the usual entirely enclosed boot member, difficult of entry, but a substantially skeleton boot member maintaining rigidity of construction, with the advantage of a quickly detachable covering that may be readily removed in the field in case of congestion or in case repair of the internal grain elevating mechanism is necessary.

As before described, a pulley of conventional construction is disposed and driven at the upper end of the elevator. Another sprocket 48 is disposed in the boot of the grain elevator and upon said pulleys is carried the endless chain 49, upon which are attached, in the usual manner, the grain elevating buckets 50. The sprockets are disposed with their axes in the same plane as the wooden divider 24, which separates into two sections the main elevator section before described and made up of the overlapping metal sections 22 and 23.

It is obvious that when grain is delivered into the boot of the grain elevator, the continuously operating chain, and more particularly, the buckets thereon, will pick up the grain therein, raise same in the elevator upon one side thereof, discharge the elevated grain at the delivery end 11, and the empty buckets will move downwardly upon the opposite side of the elevator section until they have reached the boot and again pick up the grain and continue their elevating action.

A special means has been provided for supporting and adjusting the lower sprocket 48. This mechanism includes a vertically dis-

posed sprocket supporting bar 51, angled as at 52 at a point adjacent its lower end in such manner as to project to a point at approximately the center of the boot, the same being fashioned to receive and have securely attached thereto, by riveting as at 53, a bearing 54 upon which is mounted the before mentioned sprocket 48. A washer 55, secured by pin 56, permits rotation of the sprocket upon the bearing and holds same in proper position. The sprocket supporting bar 51 projects through the angle iron supporting member 27 and is adjustably secured to the elevator section by means of bolt members 57 and 58. The bolt member 57 has its head lying within the elevator section, and its body projecting through the lug 59, thence through a slot 60 in the bar 51, a nut 61 being threaded upon the projecting end thereof in a manner to clamp the sprocket supporting bar 51 in any desired position of adjustment. The bolt 58 has a substantially similar mounting with respect to the sprocket supporting bar 51, in that the body portion thereof projects through a similar slot 62 therein, said bolt having a nut 63 threaded upon the projecting end thereof. It may be readily seen from the above that by loosening the nuts 61 and 63, any adjustment of the sprocket within the boot portion may be made without the necessity of opening up the boot. This exterior adjustment of the sprocket, and hence the endless chain, has the advantage of permitting quick adjustment thereof in the field and without the necessity of taking the time to remove the boot portions which in a grain elevator of conventional construction is a difficult matter. Also, this particular adjustable mounting results in a simplified elevator construction.

Referring to the operation of the described elevator, such operation is thought obvious as far as the elevation of the grain is concerned, and as respects the adjustment of the endless chain or grain elevating mechanism therein, the same has just been described, and mere manual adjustment of the sprocket supporting bar 51 exteriorly results in the proper tension of the elevating mechanism.

Likewise, it is apparent that by forming the elevator section of two distinct metal sections and having their edges overlap at a central point in such manner as to be engaged simultaneously by attachment members with the wooden divider member, not only an elevator section presenting an entire metal outer surface will be provided, but also an elevator section of greatly increased strength and simplicity of design.

With respect to the special boot portion of the elevator, it is apparent that by forming the skeleton framing member for the boot and thereafter detachably mounting a cover for the side of the boot, as well as a detachable band about the edges thereof, entrance to the elevator mechanism in the boot may be readily accomplished with a minimum of time and by the manual removal of a very few portions. This particular fashioning of the boot results in a greatly improved elevator mechanism and one that may be serviced quickly by an operator in the field.

What I claim is:

1. A grain elevator comprising a head portion, a boot portion and an intermediate elevating section comprising two metal half sections, the edges of one of said sections adapted to be overlapped by the edges of the adjacent section, a wood divider member having its edge portions lying adjacent the overlapping edges of the metal half sections and attachment means for connecting the overlapping edges of the metal sections and the wood divider member.

2. An elevator section comprising opposed metal half sections, adjacent edges of said metal half sections adapted to overlap in such manner that an all metal exterior is presented, and a wood divider member disposed within said sections, the edge portions thereof lying adjacent the overlapped edges of the metal section, and plural attachment means for connecting the overlapped edges of the metal sections and the wood divider member.

3. The method of forming an elevator section comprising first forming opposed metal half sections, then placing a wooden divider member in one of said sections, with the edge portions thereof lying adjacent the edges of the metal half section, then assembling the opposed half section with the edges thereof overlapping the edges of the first named half section and finally connecting the overlapped edges of the metal half section to the wood divider member.

4. A grain elevator comprising a heat portion, a boot portion, an intermediate elevating section including therein an endless chain elevating mechanism, and means for adjusting the endless chain elevating mechanism comprising a sprocket for the endless chain, a bearing for said sprocket, a bearing supporting member having one end disposed within the boot member and supporting the said bearing, the opposite end thereof being disposed exteriorly of the elevator, and means connected with said exteriorly disposed portion of the bearing supporting member permitting adjustment thereof to vary the tension of the endless chain mechanism.

5. A grain elevator comprising an elevating section including an endless chain elevating mechanism therein, a boot member, a driving sprocket for the endless chain mechanism, and means for adjusting the position of said sprocket to vary the tension of the endless chain comprising a sprocket supporting member having a portion thereof disposed exteriorly of the elevator section, and mechanism connected with said sprocket supporting

mechanism permitting manual adjustment of the tension of the endless chain outside the elevator section.

6. A grain elevator having an elevating section and a boot portion, said boot portion comprising rigid framing members fixed to said elevating section, a flexible metallic band extending peripherally around said framing members to form an outer wall of said boot, and having one of its ends fixed to said elevating section, and means for detachably securing its other end to said elevating section, said means being adapted to apply tension to said band.

7. A grain elevator having an elevating section and a boot portion, said boot portion comprising rigid framing members fixed to said elevating section, a flexible metallic band extending peripherally around said framing members to form an outer wall of said boot, and having one of its ends fixed to said elevating section, means for detachably securing its other end to said elevating section, said means comprising a bracket, a threaded member cooperating therewith, and a nut for drawing said bolt and bracket together to tension said band.

In testimony whereof I have hereunto affixed my signature.

ARTHUR J. HARTLEY.