E. C. STARNES AND E. C. WILLIS.

GRAIN HANDLING MEANS.

APPLICATION FILED MAY 3, 1920.

1,405,692.

Patented Feb. 7, 1922.

2 SHEETS—SHEET 1.

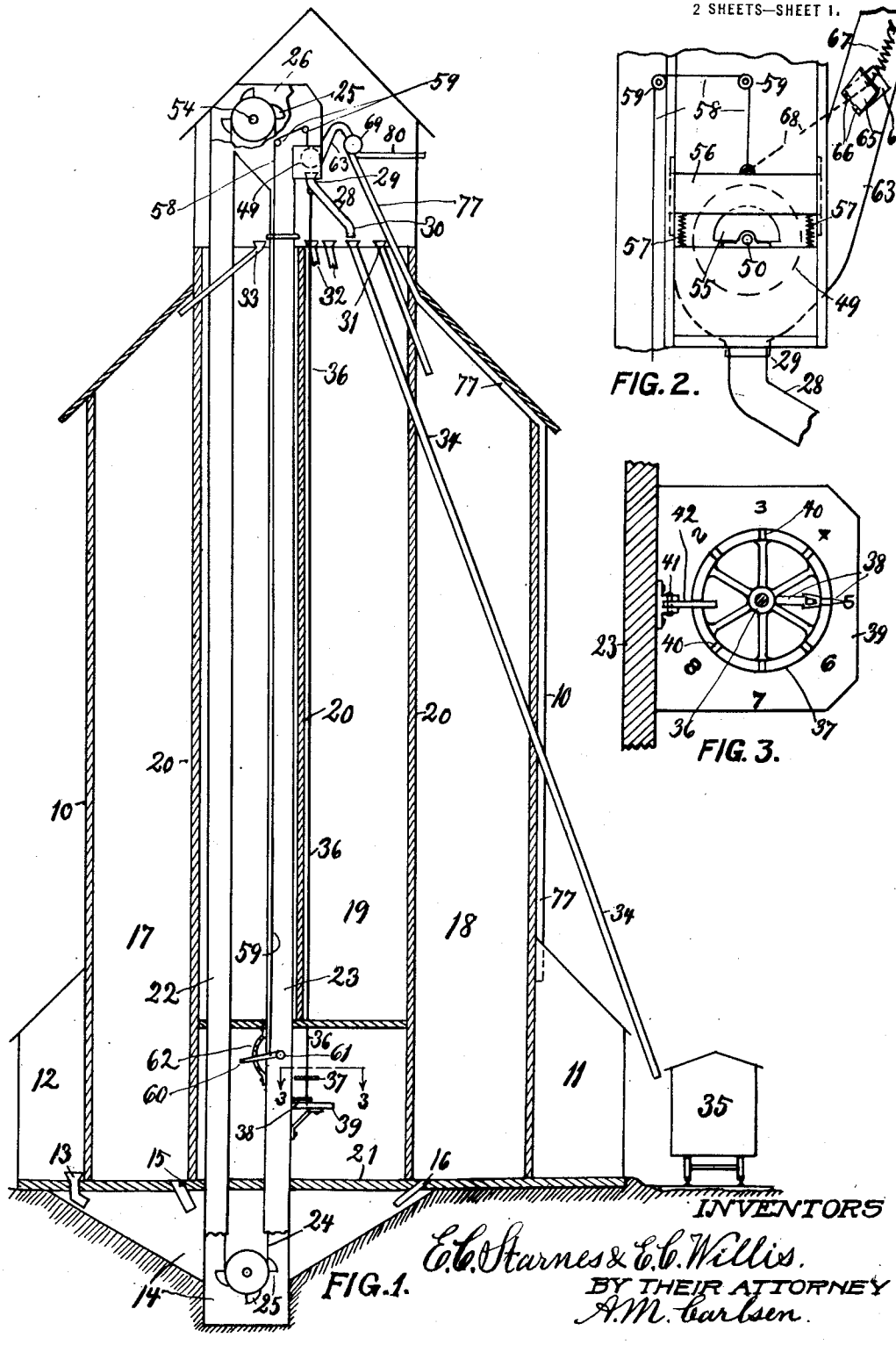


FIG. 1.

FIG. 2.

FIG. 3.

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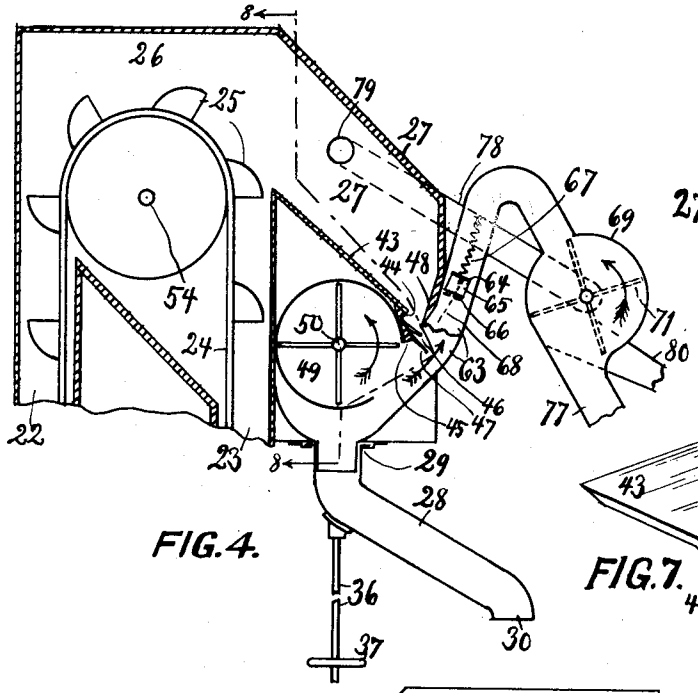


FIG. 4.

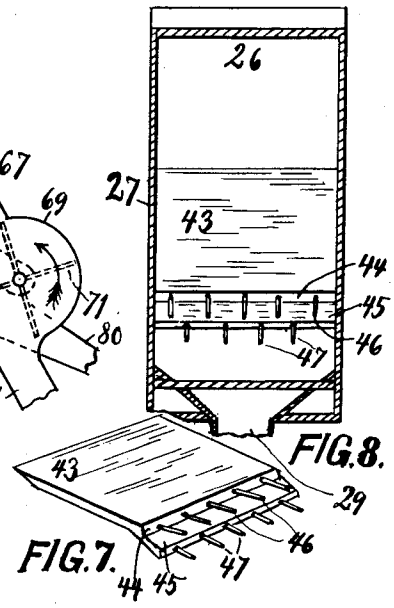


FIG. 8.

FIG. 7.

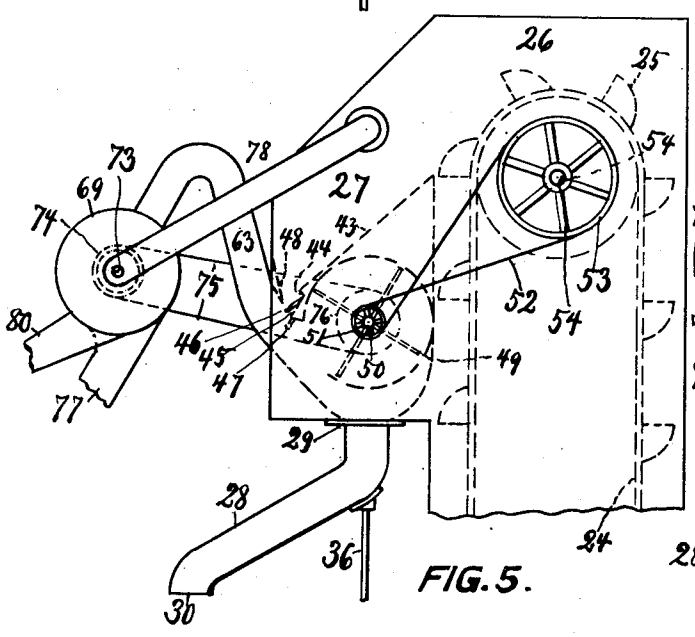


FIG. 5.

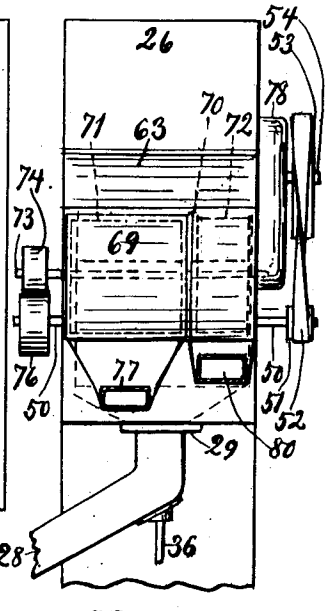


FIG. 6.

INVENTORS:

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UNITED STATES PATENT OFFICE.

EARL C. STARNES AND EDWARD C. WILLIS, OF ALPHA, MINNESOTA.

GRAIN-HANDLING MEANS.

1,405,692. Specification of Letters Patent. Patented Feb. 7, 1922.

Application filed May 3, 1920. Serial No. 378,673.

To all whom it may concern:

Be it known that we, EARL C. STARNES and EDWARD C. WILLIS, citizens of the United States, residing at Alpha, in the county of Jackson and State of Minnesota, have invented a new and useful Grain-Handling Means, of which the following is a specification.

Our invention relates to new methods and means for handling grain, and the main object is to reduce the cost of handling and treating the grain, by consolidating several actions, operations and movements required for hoisting, scalping, conditioning and delivering the grain either into grain cars for shipping or into bins from which cars may afterwards be loaded. Another object is to improve some of the operating means involved.

In the accompanying drawings:

Fig. 1 is a vertical section of a grain elevator building equipped with and embodying our invention, and a grain car alongside the building. Fig. 2 is an enlarged side view of the main fan casing, showing means for admitting air thereto and for regulating vacuum in the adjacent parts. Fig. 3 is an enlarged section on the line 3—3 in Fig. 1. Fig. 4 is a partly sectional side elevation of the receiving head of the elevator and its adjacent fans. Fig. 5 is Fig. 4 seen from the opposite side and showing also the pulleys and belts of the elevator head. Fig. 6 is a left side or edge view of Fig. 5 with the belt 75 omitted. Fig. 7 is a perspective view of the grain guiding and dividing board. Fig. 8 is a section on the line 8—8 in Fig. 4.

Referring to the drawing by reference numerals, 10 designates the head house or building of a grain elevator, close to which is built a dust house 11 and a shed 12. The shed represents one of several sheds into which teams or cars may haul grain and dump it through spouts like 13 into a pit 14 in the base of the building. Into said pit grain may also be run through spouts 15, 16, from bins 17, 18, 19, and other bins, not shown, created by suitable partitions 20.

21 is the working floor, and up through the same extend the elevator legs 22—23 of the usual endless elevator 24, having cups 25 by which to carry grain from the pit 14 up into the elevator head 26, from which it is dumped into a dumping pocket 27 which delivers it directly into a scalping and conditioning apparatus having in its bottom a distributing spout 28 connected by a swivel joint 29, so it may be swung in a horizontal plane with its outlet end 30 over either one of the tubes 31, 32, 33, of the bins or over the long tube 34, which is arranged for loading grain cars 35 placed near the building. The spout 28 is rotated by a shaft 36, which near the working floor 21 is provided with a hand wheel 37, and a pointer 38. Said pointer is arranged to point to different numbers upon a dial 39 and thereby indicate the position of the spout 28. The dial is arranged upon or may constitute a table into which the bottom end of the shaft 36 may be journaled. In Fig. 3 is shown that the hand wheel 37 may have a notch 40 for each number 1 to 8, on the dial, and near the wheel is pivoted at 41 a dog 42 adapted to be dropped into either of the notches 40 so as to prevent accidental rotation of the wheel.

Turning now to a further description of the dumping pocket 27 and its adjacent mechanism, the bottom of the pocket is an inclined guiding and spreading board 43 having across its lower end a recess forming two baffle-plates 44, 45, each of which is provided with a series of fingers 46 or 47; and above said baffle plates the pocket itself is formed with a baffle plate 48.

Disposed close below the board 43 is a blower fan 49 having its shaft 50 provided with a pulley 51, driven by a cross belt 52 from a pulley 53 fixed on the shaft 54 of the elevator.

The fan 49 receives its air through an aperture 55, (see Fig. 2) the size of which is regulated by a vertically slidable closure 56 having one or more springs 57 tending to close it, and a cable 58 for opening it. Said cable is guided over pulleys 59 and has its operated end extended to the working floor, where it is connected to a lever 60, which is pivoted at 61 and arranged to engage in notches of a sector 62 fixed on one of the elevator legs or any other stationary object.

The air blown from fan 49 passes through a flue 63 having a side aperture 64 closed by a lid 65, which is hinged at 66 and normally held closed by a spring 67 and may be more or less opened by a chain or cord 68 connecting it with the closure 56 or the cable 58 above the closure.

The upper end of the flue is curved downwardly and provided with a fan casing

69 having a partition 70 dividing it into two chambers for two fan wheels 71, 72, both of which are fixed on the same shaft 73, which has a pulley 74, driven by a belt 75 (see Fig. 5) from a pulley 76 fixed on the shaft 50 of the lower fan. The fan 71 sucks air from the flue 63 and delivers it and all chaff and dust it contains through a tube 77 into the dust house 11. The other fan, 72, draws its air through a tube 78 from an aperture 79 in the dumping pocket or elevator head and exhausts by way of a tube 80 to the outside of the building.

In the operation of the apparatus as a whole the grain is elevated and dumped from the elevator cups in distinct lots from each cup upon the plate 43 down which it slides by gravity and mixes one lot with another and is partly spread by the plate 43, but as the stream of grain moves on quite fast it does not get fully spread by the plate only and as it would be poor operation to allow it to pass into the flue 63 in lumps, the stream is retarded and spread by the baffle plates 48, 44 and 45 and by the fingers 46, 47, projecting in alternate position from the baffle plates. After being thus fully spread the stream of grain enters the flue 63, in which the blast from the fan 49 passes through it, allowing the clean grain to pass downward into the distributing spout 28 while the chaffs, dust and other light stuffs are blown so far up the flue 63 that the suction of the fan 71 gets hold of them and they are delivered by the latter fan into the dust house through the tube 77. This part of the operation is modified and regulated according to the condition of the grain by more or less opening or closing of the closure 56 of the air intake 55, and the lid 65 by which vacuum in the flue 63 is regulated.

Meanwhile the fan 72 is removing from the elevator head 26 and pocket 27 such dust and light stuff as will usually fill the air therein and be drawn downward by the elevator cups into the pit and mix with the grain therein unless removed by said fan and the tubes 78 and 80 of same. If cars are available the grain is loaded into them through the tube 34, thus cleaning or scalping and conditioning and loading the grain in a single one operation. Or if cars are not always available or ready to be loaded, the grain may be directed into some of the bins, and afterward simply loaded therefrom into the cars.

It will be understood that as the grain passes from the plate 43 into the chute an upper sheet-like stream of it is divided by the fingers 46 into several smaller streams, and the heavier part of the grain passes therebelow along the baffle plate 45 and is divided by the fingers 47 into a lower sheet of small streams, all of which upper and lower small streams divide the grain so fully in the air that the blast gets the maximum chance to blow away all light and foreign matter from the downward passing grain.

Having thus described our invention and its operation, what we claim is:

1. In a grain cleaning apparatus a dumping pocket having an inclined bottom, a vertically disposed baffle plate (48) for rebounding and spreading the grain, near above the lower end of the inclined bottom, and a grain outlet adjacent the lower end of the bottom, and means for blowing a current of air upwardly past the opening for cleaning the grain dropping therefrom, said bottom having its lower end offset downwardly to form a shoulder, a series of fingers projecting from the shoulder and another series of fingers projecting from the downwardly offset end of the bottom, said fingers of one series being arranged in line with the spaces between the fingers in the other series, so as to effectively spread into the air current the grain to be cleaned.

2. In an apparatus of the kind described, an elevator head having a dumping pocket, an air flue receiving the grain from the dumping pocket, a fan blowing air upwardly through the flue, a suction fan aiding the blown air current in its movement, a driven shaft fixed in the head of the suction fan, a second suction fan of smaller capacity and having its head fixed on the same shaft as the first mentioned suction fan, and its casing operatively connected with the inclosure of the elevator head at the point where the grain is thrown from the elevator into the dumping pocket.

In testimony whereof we affix our signatures.

EARL C. STARNES.
EDWARD C. WILLIS.