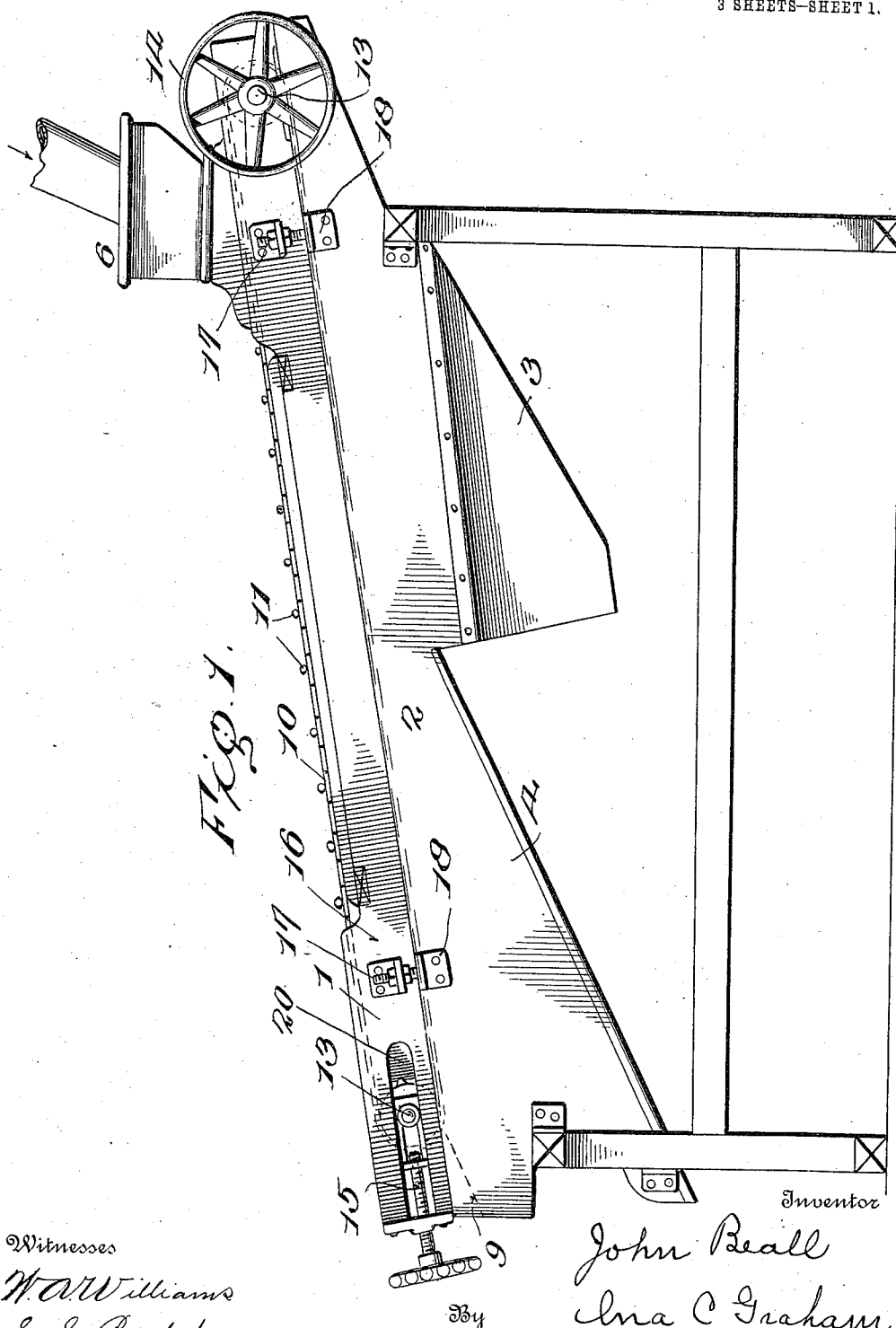


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APPLICATION FILED NOV. 27, 1909.

Patented Feb. 21, 1911.

3 SHEETS-SHEET 1.



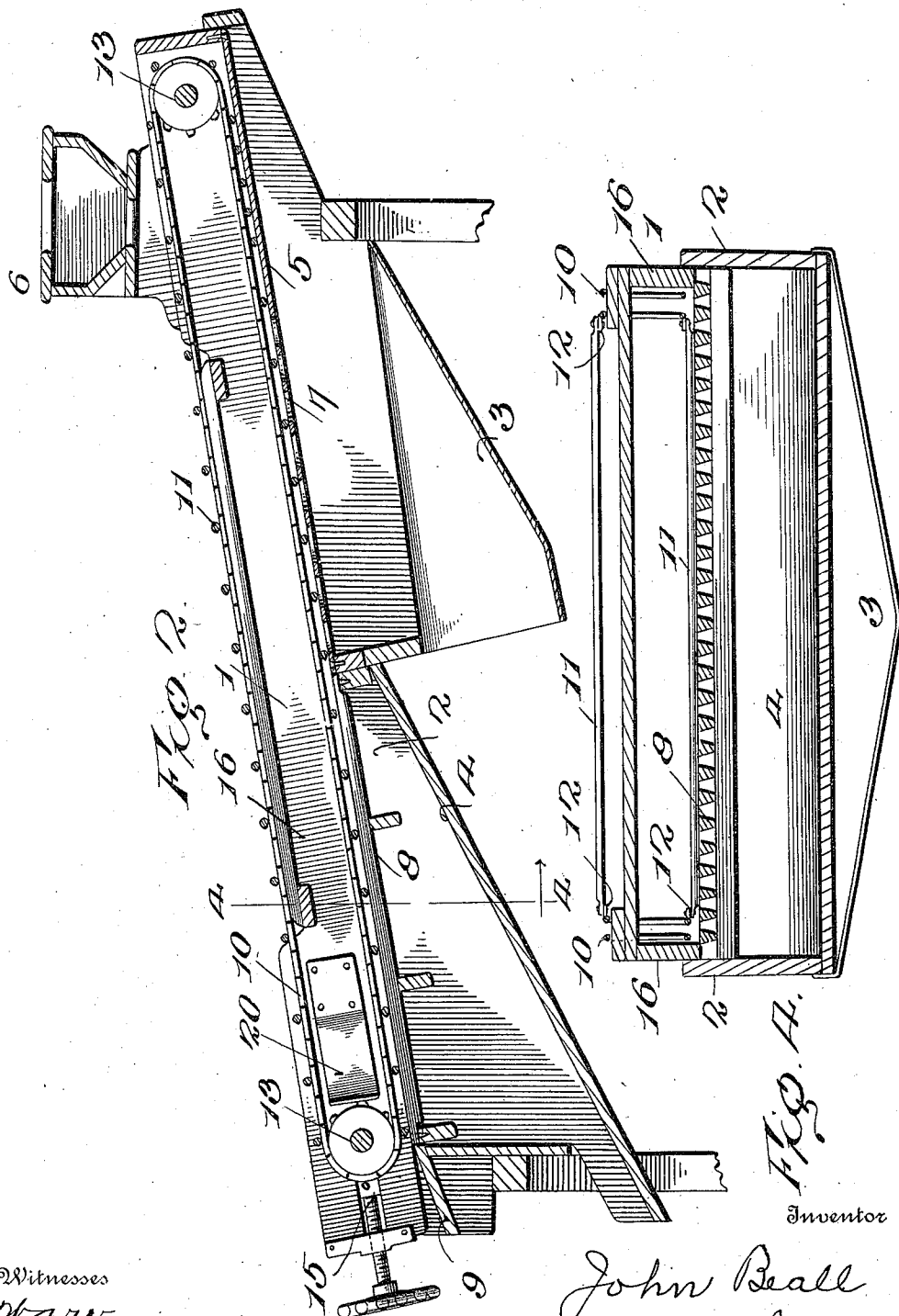
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3 SHEETS—SHEET 2.



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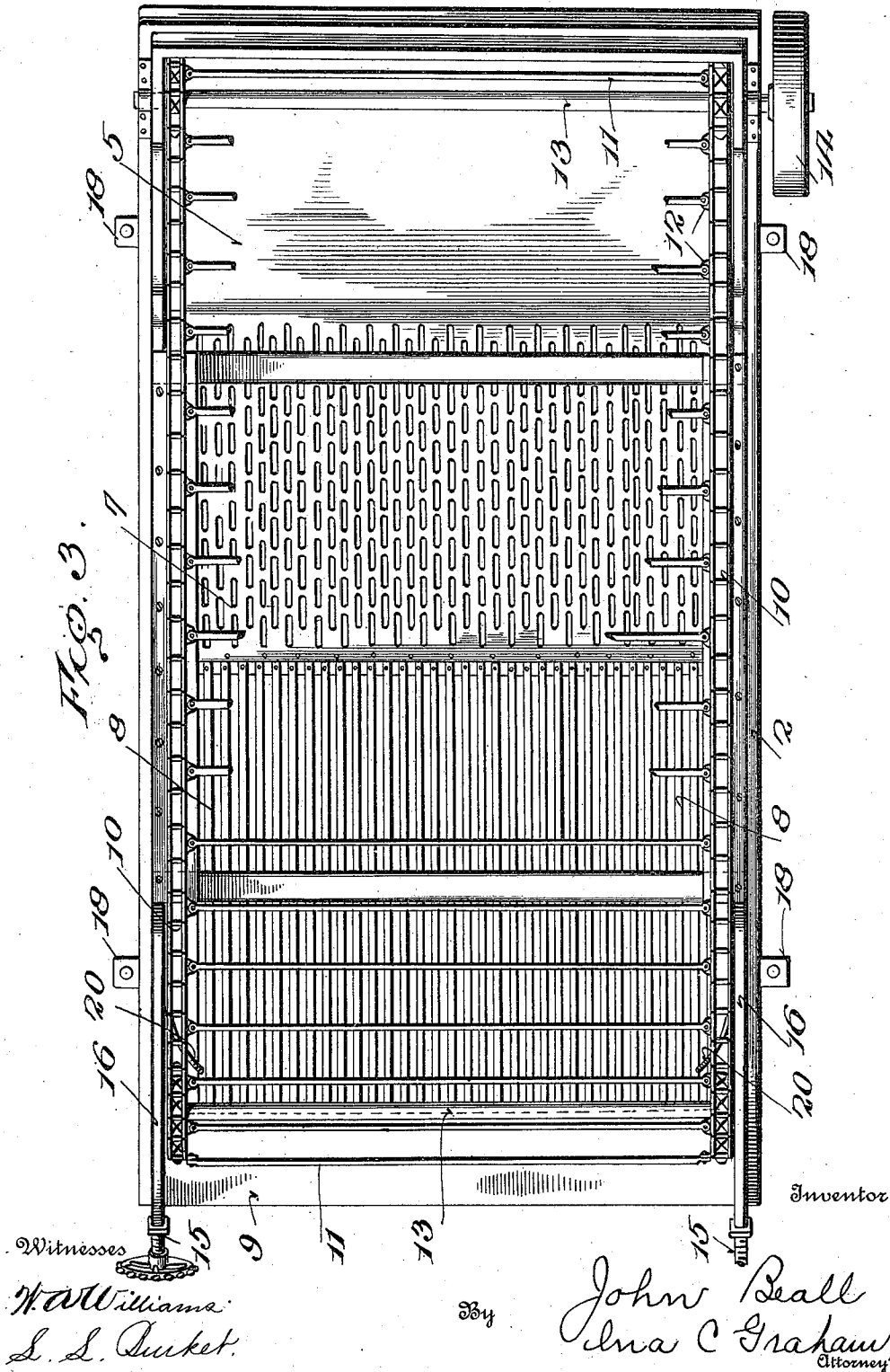
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984,740.



UNITED STATES PATENT OFFICE.

JOHN BEALL, OF DECATUR, ILLINOIS, ASSIGNOR TO HUGH CREA AND LOUIS D. WHITE,
BOTH OF DECATUR, ILLINOIS.

GRAIN-CLEANER.

984,740.

Specification of Letters Patent.

Patented Feb. 21, 1911.

Application filed November 27, 1909. Serial No. 530,247.

To all whom it may concern:

Be it known that I, JOHN BEALL, a citizen of the United States, residing at Decatur, Macon county, Illinois, have invented certain new and useful Improvements in Grain-Cleaners; and I do hereby 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 certain improvements in apparatus for cleaning or separating grain; and the objects and nature of my invention will be readily understood by those skilled in the art in the light of the following explanation of the accompanying drawings illustrating what I now consider my preferred embodiment from among other formations and arrangements within the spirit and scope of my invention.

It is an object of my invention to provide constantly traveling means for forcing and stirring the grain over and along a screening surface which is fixed or stationary while in action.

The invention consists in certain novel features in construction and in combinations and arrangements of parts and elements substantially as described and claimed.

Referring to the accompanying drawings:—Figure 1, is a side elevation of a machine embodying my invention. Fig. 2, is a vertical longitudinal section. Fig. 3, is a top plan view thereof, the feed hopper being removed. Fig. 4, is a sectional view taken on line 4—4 of Fig. 2.

In the drawings, 1, is any suitable supporting frame comprising longitudinal sides 2, from the spaces between which hoppers or chutes 3, 4, depend for receiving foreign material separated from the grain, and for receiving and delivering the screened grain. The screening surface is carried by the frame and is arranged longitudinally of and between said longitudinal sides 2, and over the open tops of said hoppers, and is usually arranged in a longitudinal plane inclined or sloping from the receiving end thereof downwardly to the discharge end thereof. At the receiving end of the machine, I usually arrange a flat imperforate sheet or surface 5 (usually sheet metal) between the frame sides and into which the grain is delivered from feed or supply hop-

per 6, and from this receiving sheet 5, the grain passes onto the screening surface proper which is usually flat and in continuation of and in approximately the same longitudinal inclined plane as the receiving sheet or surface 5.

In the specific example illustrated, the screening surface proper comprises several screens of different degrees of fineness removably resting or secured in the frame. For instance, I show two screens, the first one of which in the direction of movement of the grain is formed of perforated sheet metal 7, of a fineness to prevent passage of the grain therethrough but to permit downward passage therethrough of foreign material smaller in size than the grain and to be separated therefrom. The next screen in the direction of movement of the grain is formed to permit the grain to drop therethrough but to separate therefrom foreign material of larger size than the grain by preventing the passage of such foreign material through said screen. I prefer to form this screen by spaced parallel bars 8, arranged longitudinally of the screening surface and parallel with the direction of movement of the grain and forming elongated narrow slits between the bars through which the grain drops. The vertical side faces of the bars converge downwardly to form said slits, flaring downwardly for the purpose of preventing clogging.

Beyond the barred screen a downwardly inclined discharge surface 9, is provided for the foreign material passing over and from the barred screen.

Suitable means are provided for rubbing, pushing, sliding or forcing the grain from the receiving surface along the screening surface, and at the same time stirring or agitating the same so as to bring all particles thereof into contact with the screening surface. In the specific example illustrated, I accomplish this purpose by what might be termed an endless, continuously moving, conveyer having one ply over and longitudinally of the screening surface from the receiving to the discharge end of said surface. This conveyer comprises a pair of endless sprocket chains 10, arranged above the opposite longitudinal edges of the screening surface and rigidly connected by parallel spaced straight cross rods, bars or slats 11,

arranged transversely of the screening surface, and at their ends suitably secured to the links of the chains. If so desired, the ends of the bars can be secured to lateral ears 12, projecting from certain links of the chains; the bars being preferably uniformly spaced. The sprocket chains are carried by sprocket wheels fixed on transverse shafts 13, one of which can be provided with a drive pulley 14. The chains are kept at the desired tension by adjusting means 15, of any suitable construction as will be well understood by those skilled in the art.

The conveyer is carried by a suitable longitudinal frame arranged over the supporting frame sides 2, and comprising longitudinal beams 16, between which the shafts 13, extend and by which they are carried and supported. This conveyer supporting frame is preferably vertically adjustable with respect to the screening surface to move the grain moving devices to or from the screening surface. For instance, for this purpose, I can provide vertical adjusting bolts 17, carried by and arranged at the outer sides of the conveyer frame side beams 16, and screwing longitudinally in threaded ears 18, projecting from the supporting frame sides 2.

During the operation of the machine, the cross slats or scrapers of the conveyer, pass successively along the grain receiving surface and scrape, push or slide the grain therefrom and onto and along the screening surface to carry out the cleaning and separating process hereinbefore described. The cross bars preferably rub or slide along the screening surface and said bars or scrapers can be variously formed to attain the results described. If so desired, they can be provided with flexible brushing surfaces or surfaces of closely arranged points or projections can be provided.

The endless chains can be arranged entirely above the screening surface, or the return ply thereof can move back beneath said surface.

If so desired guides 20, can be arranged at the discharge end of the screening surface to prevent the refuse or foreign material passing into the rear sprocket wheels.

My machine provides sprocket chains connected by cross rods designed to move along the screening surface at a comparatively rapid rate of speed and to pass under and through the mass of grain resting on the screening surface and between the sprocket chains, and thereby convey or propel the mass of grain toward the rear end of the machine and stir and agitate the mass of grain to bring all portions thereof into contact with the screening surface. These rods are also designed to sweep the screening surface and prevent the grain from clogging the openings thereof, and to keep the grains

under such constant motion that they do not have opportunity to find secure lodgment in the screening surface openings.

The screening surface is not sharply inclined to cause forward movement of the grain by gravity, thereby necessitating the employment of slowly moving retarding slats and belts, or in other words, the angle of inclination of the screening surface is less than the angle of repose of the material to be operated on. In my machine the grain is conveyed, moved or dragged over the screening surface by the rapidly moving agitating and propelling cross rods spaced comparatively short distances apart and moving through the practically continuous body or layer of grain on the screening surface and kept under forward motion by the rapid succession of rods passing therethrough.

It is my aim to secure a machine of large capacity, that is, to rapidly handle large quantities of grain, and hence I provide the rapidly moving sprocket chains and rods to propel the grain, the machine being open between the chains so that there is no limit to the quantity of grain that can pile up on the screening surface and so that the grain can be delivered by the feed hopper into the space between the chains and constantly traversed by the rods, that is at a point in advance of the rear shaft carrying the rear sprocket wheels.

What I claim is:

1. In combination, a grain receiving surface, a relatively stationary screening surface to which the grain is pushed and propelled from said receiving surface, transverse shafts beyond the front and rear ends of said surfaces, respectively, and provided with sprocket wheels, a pair of endless sprocket chains carried by said wheels and arranged at the opposite longitudinal sides of said surfaces, spaced separated grain propelling and agitating cross rods between and carried by said chains and sweeping forwardly close to said surfaces to move forwardly through a mass of grain on said surfaces and stir and propel the same from said receiving to said screening surface, the space above said screening surface and between said chains being open and unobstructed except by said rods to permit the grain to pile on said surface covering said rods, substantially as described, and means for propelling said chains to carry said grain-pushing and propelling rods forwardly on said surfaces.

2. In combination, a frame, a screen, inclined at an angle less than the angle of repose of the material to be screened, a surface for delivering grain to said screen, continuously moving means arranged at each side of said surface and screen and provided with grain-agitating and propelling-rods arranged transversely of and moving longi-

5 tudinally along said surface and screen to propel the grain from said surface to and along said screen, and means to deliver grain between said rods and directly onto the portion of said surface traversed by said rods, substantially as described.

10 3. In combination, a grain receiving and delivering surface, a screening surface longitudinally inclined at an angle less than the angle of repose of the material to be received thereon, endless sprocket chains arranged longitudinally thereof, and at opposite edges thereof and extending rearwardly beyond the same, means for carrying and for 15 rapidly driving said chains, series of spaced grain-propelling-and-agitating cross rods secured to said chains and moved thereby longitudinally along said surface, and means to discharge grain between said chains and 20 directly onto said receiving surface for delivery to said screening surface.

25 4. In combination, a frame, a grain receiving and delivering surface, a screen in forward continuation of said surface and forwardly inclined at an angle less than the angle of repose of the material to be screened, endless sprocket chains arranged longitudinally of said surface and screen, and at opposite edges thereof, shafts and 30 sprocket wheels for carrying and driving said chains, cross rods secured to said chains and traversing said surface and screen and moved forwardly thereon to propel the grain from said surface to said screen and

to agitate the grain on and drag the same 35 forwardly along said screen, and means for delivering the grain onto said surface at a point between the rear end portions of said chains and in advance of the rear shaft thereof, substantially as described. 40

5. A main frame, a screening surface carried thereby and arranged longitudinally thereof and of varying mesh, and a grain receiving plate carried by said frame in rearward continuation of said surface, in combination with an upper frame arranged 45 longitudinally of and supported by said main frame, means for vertically adjusting said upper frame with respect to said main frame, transverse shafts carried by and arranged at the opposite end portions of said upper frame and provided with sprocket 50 wheels, endless sprocket chains mounted on said wheels and arranged longitudinally of and at opposite side edges of said plate and surface and provided with spaced-parallel grain propelling and agitating cross rods movable forwardly along said plate and surface, and a grain spout carried by said upper frame between said shafts for delivering 60 grain between said chains directly onto the portion of said plate traversed by said rods.

In testimony whereof I affix my signature, in presence of two witnesses.

JOHN BEALL.

Witnesses:

L. E. CAMPBELL,
NEAL R. SINE.