

(No Model.)

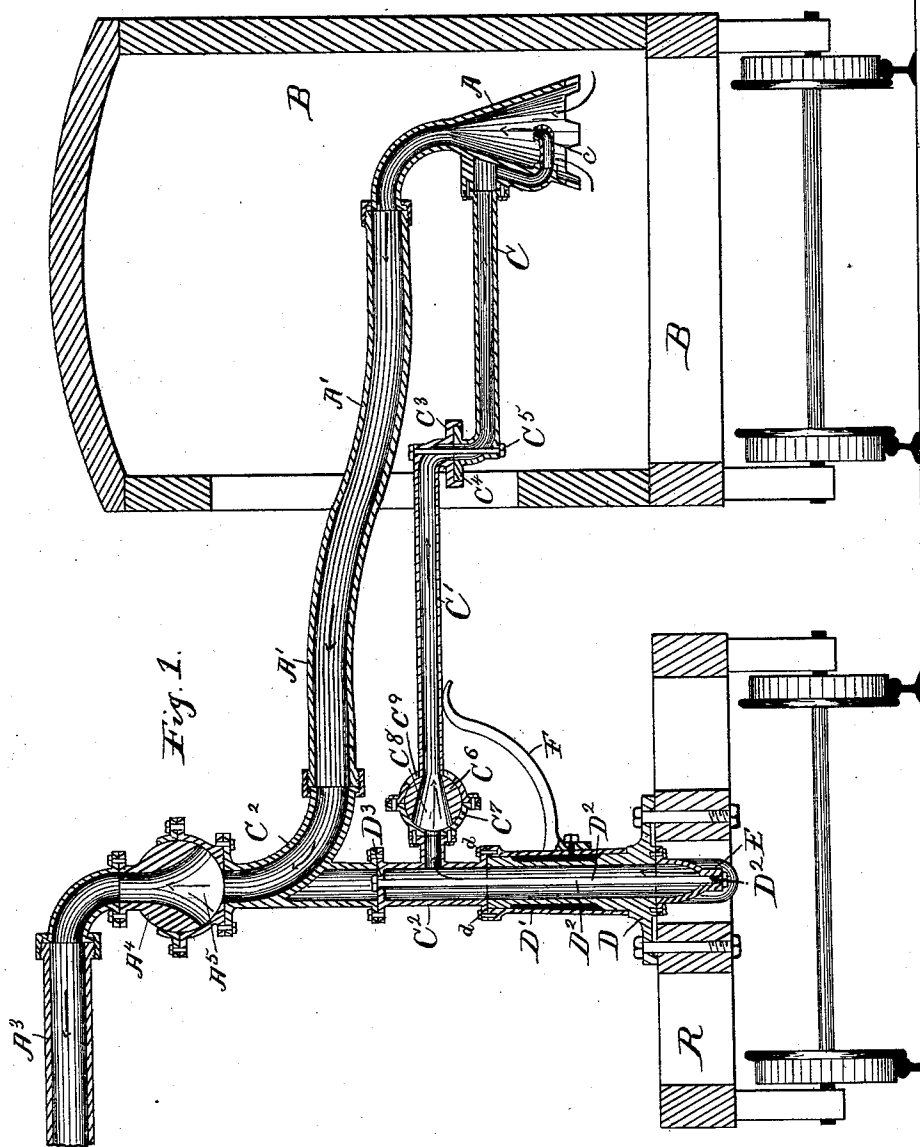
4 Sheets—Sheet 1.

J. LEWIS.

PNEUMATIC APPARATUS FOR TRANSFERRING GRAIN.

No. 351,783.

Patented Nov. 2, 1886.



Witnesses.

Sew. C. Curtis.
H. M. Munday.

Inventor:

Joseph Lewis.

By Munday Evans & Adcock
his Attorneys:

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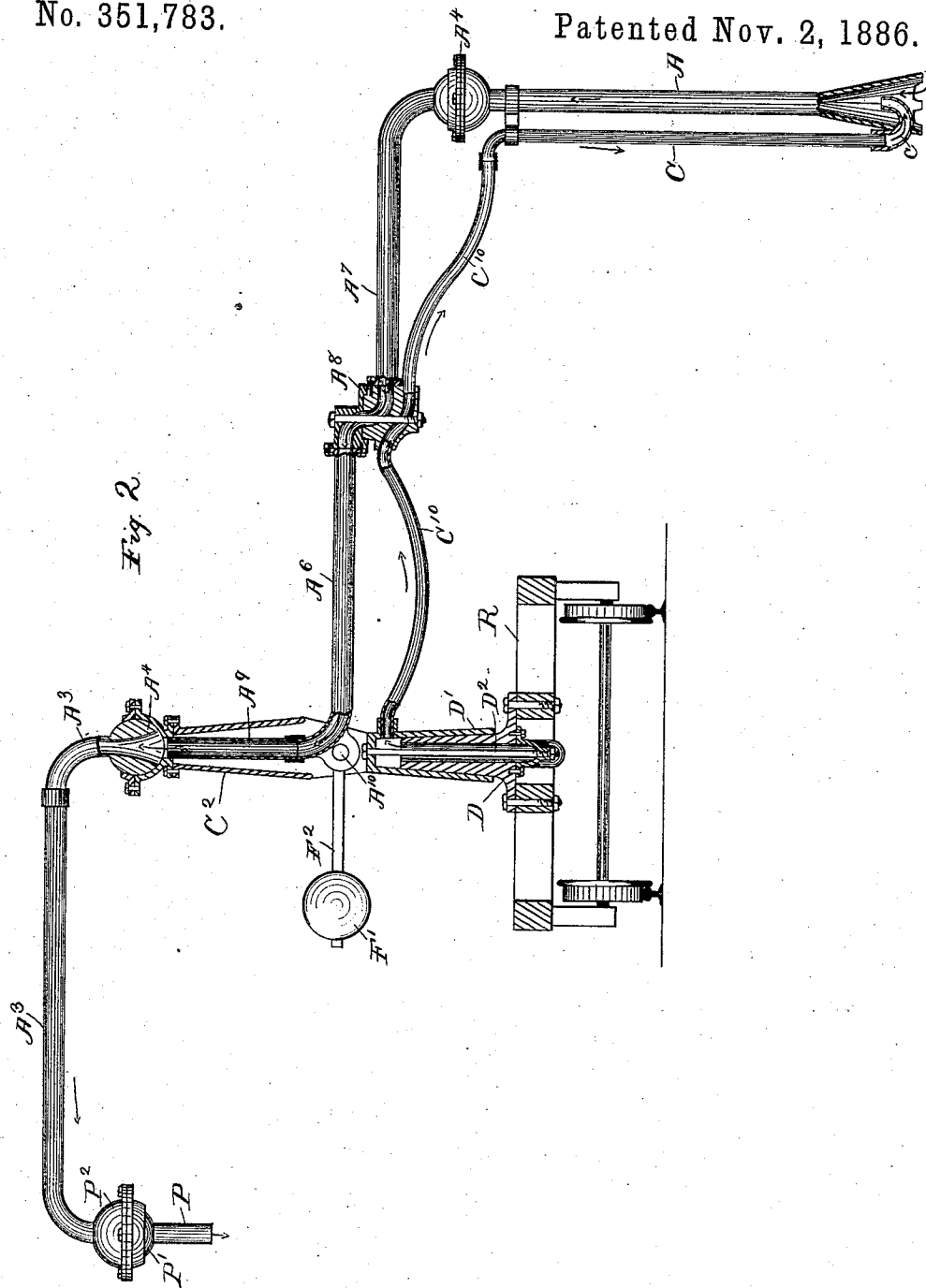
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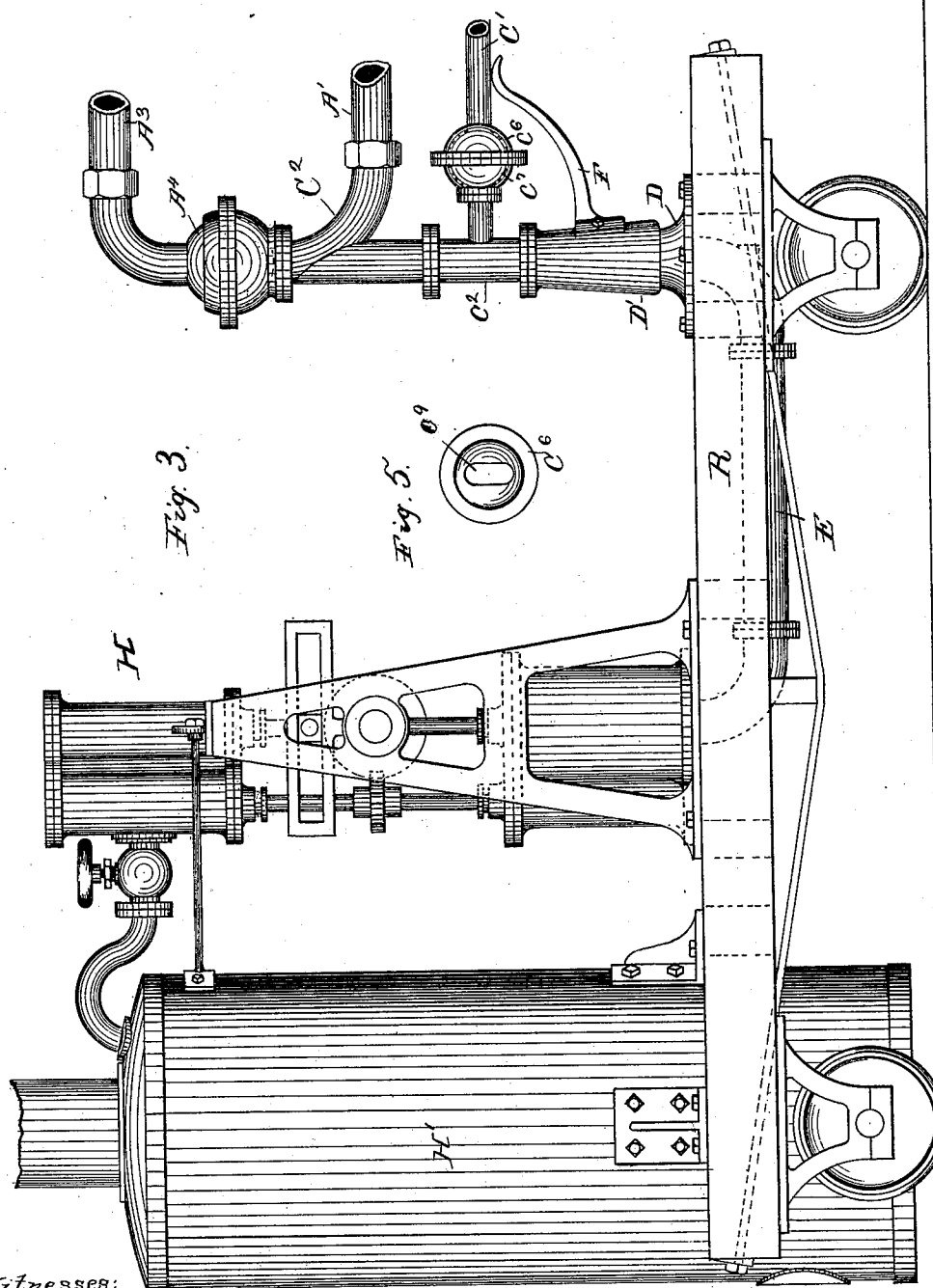
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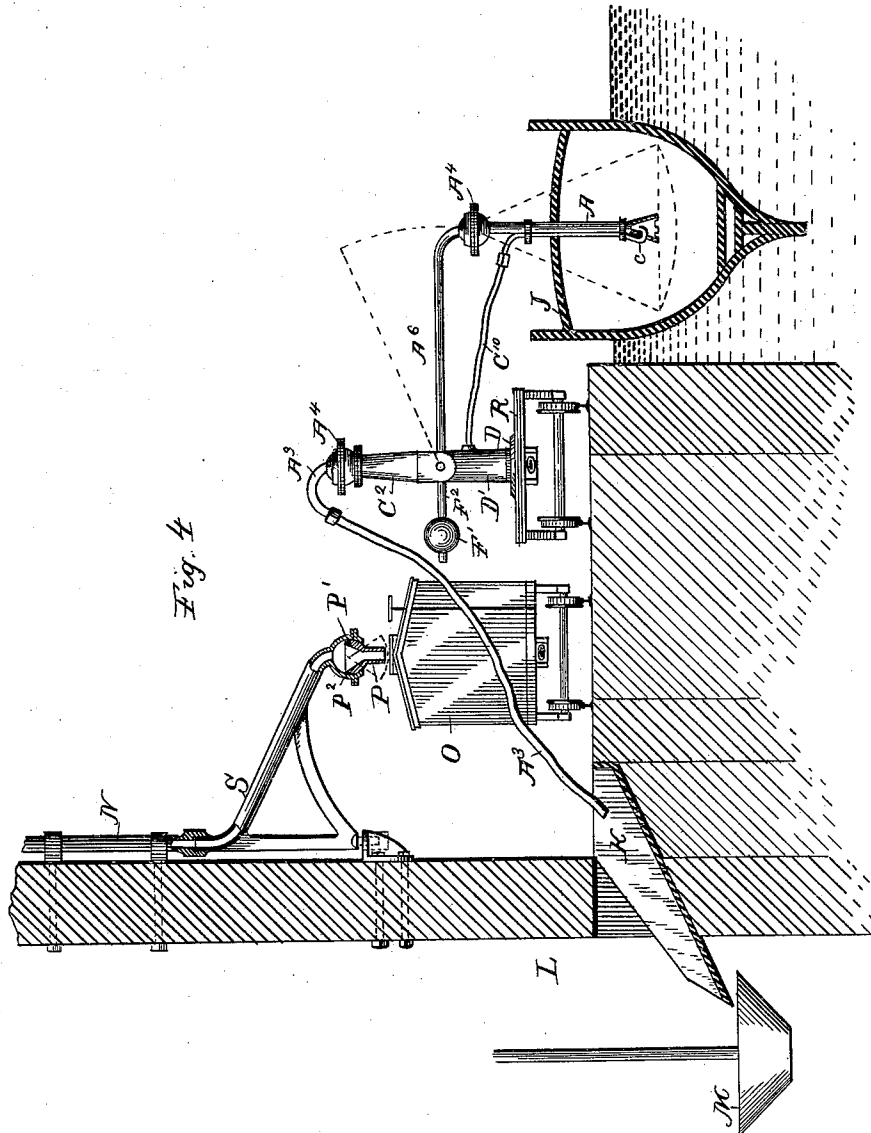
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UNITED STATES PATENT OFFICE.

JOSEPH LEWIS, OF SOUTH EVANSTON, ILLINOIS.

PNEUMATIC APPARATUS FOR TRANSFERRING GRAIN.

SPECIFICATION forming part of Letters Patent No. 351,783, dated November 2, 1886.

Application filed February 13, 1886. Serial No. 191,836. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH LEWIS, a subject of the Queen of Great Britain, residing in South Evanston, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Pneumatic Apparatus for Transferring Grain, of which the following is a specification.

In the Letters Patent to me of September 18, 1883, No. 285,047, there is shown a nozzle intended to be held in the hand during use in unloading or drawing grain from a car or other receptacle, such nozzle being provided with vent-tubes placed parallel to the nozzle and extending down to the orifice thereof, for the purpose of supplying air to the orifice and preventing choking at that point. This vented nozzle, while it effectually prevented choking, is subject, I find, to another objection—viz., that it so reduces the sucking-power of the induced current in the pipe to which the nozzle is attached, and due to the elevating-blast in the main elevating-passage of the apparatus, that the grain is not economically moved; hence I have been led to substitute for said vented nozzle the devices hereinafter described.

Instead of relying upon the induced current of my said patent to suck up the grain into the same, (although such induced current may be and should be present when the nozzle is connected to an elevating-blast in the manner shown in said patent,) I furnish the nozzle with an upwardly-directed blast or jet of air at a point just within its mouth, whereby to create the necessary suction at the mouth to draw in, and at the same time to propel, the grain on its upward course and prevent the choking. The primary feature of my invention consists in the combination, with the nozzle, of this blast thus delivered thereto in an upward direction and just within its mouth.

In order that the nozzle and its accompanying blast may be moved about in the car or receptacle and kept in contact with the grain, I make the grain and air pipes with which they are connected flexible, either by the use of universal joints or by making the pipes themselves of flexible material; and my invention partly relates to these features of construction.

In the drawings, Figure 1 is a vertical section of my invention. Fig. 2 is a like view of a modification thereof. Fig. 3 shows a transfer-car provided with an air-supplying engine, and Fig. 4 shows how the apparatus may be utilized at an elevator-building. Fig. 5 is a detail of one of the pipe-joints.

In the drawings, A represents the nozzle to be inserted and moved about in the body of grain to be transferred from the car B or other receptacle. It is preferably cone or bell shaped at the mouth.

C C' is the blast-supplying pipe, terminating in the jet c, passing through to the inside of the grain-nozzle, and delivering the blast therein in an upward direction in close proximity to the mouth. This creates a suction below the air-jet and draws the grain into the nozzle A. At the same time it propels the grain upward in the grain-tube and avoids any choking at the mouth of the grain-nozzle.

As the grain-nozzle and its air-supplying tubes must be moved about in the grain, I connect them to the stationary parts of the elevator or transfer apparatus by pipes which are flexible. This flexibility may be obtained by making the pipes themselves flexible or by forming them of metal in sections united by joints which permit the required movements. I prefer to make one of the pipes at least partly of flexible material and the other of metal with the flexible joints, so that the latter may be made to project horizontally, and also be made to support and guide the other. Thus in Fig. 1 the grain-pipe is made to embody a flexible or hose section, A', while the air-pipe is wholly metal, the latter being provided with a face-flange joint between the sections C and C', and a universal or globe joint between the latter and post C². In the former of these joints the ends of the pipe-sections are bent down and up so as to meet, and provided with flanges C³ and C⁴, respectively, and are held together by a bolt, C⁵, passing centrally through the bent portions. This joint allows section C to swing in a horizontal plane upon the bolt C⁵ as a pivot. The joint at the post permits movement up and down, being composed of the globe C⁶ on the section C', and an inclosing-shell, C⁷, on the post, the former having a spreading mouth, C⁸, so the supply of air may

be continuous, and the latter an elongated opening, C², like that shown in Fig. 5, to allow the vertical movement of the pipe.

The air-blast may be introduced to the interior of post C², and from thence into the pipe C C'. Said post may also be capable of movement around its vertical axis. I obtain this freedom by providing the post with a stationary base, D, and secure it thereto by a sleeve, D', inclosing said base, and secured to the movable post, as by bolts Z, and a central bolt, D², passing through diaphragm D³ and the end of the air-conduit E, connecting with the bottom of the post, and by providing the top of the post with a globe-joint, A⁴, uniting it to the branch A³, leading to the elevator building or to the place where the grain is to be discharged. By widening the opening A³ in the globe of this joint the conduit A³ may be allowed to rise and fall without obstructing the passage through which the grain is lifted.

In the modification, Fig. 2, the grain-pipe is composed of two metal sections, A⁶ and A⁷, coupled together by a face-flange joint, A⁸, and bolt, similar to that already described and shown in Fig. 1 as uniting the sections C and C' of the air-pipe. In this case, also, the nozzle A is united to the section A⁷ by a universal globe-joint, A⁴, similar to that at A⁴ in Fig. 1, so that the nozzle may be inclined in any direction and moved laterally, while the vertical movement is permitted by the flexible or hose section A³, connecting the section A⁶ with the conduit A⁷ or globe-joint A⁴, and pivoting said section A⁶ to the post at A¹⁰. The blast-pipe C c, used with the grain-pipe just described, is provided with a flexible or hose connection, C¹⁰, extending to the post, and supported, if necessary, in the coupling A³, as shown. The post in this modification may, as in the other case, form a part of the conduit for the air, and have a similar base, D, and be held thereon by a similar sleeve, D', secured to or integral with the post, and bolt D².

In order that the attendant who guides the nozzle to the grain may not be obliged to sustain the entire weight of the nozzle and its connections above described, I provide a spring, F, extending from the sleeve D' and supporting the pipes, as in Fig. 1; or, in lieu of the spring, a counterbalance-weight, F', upon the arm F², projecting to the rear from one of the metal sections of pipe—as, for instance, A⁶—may be employed, as in Fig. 2; or, if more convenient, the nozzle may be supported from the elevator building or tower.

The apparatus above set forth may be mounted upon a car, R, as illustrated in the several figures, or it may be stationarily located. It may be employed to draw the grain from one car or vessel into another, or into or from the elevator, or from one bin or receptacle to another. It may be connected and deliver the grain to a force-blast apparatus, such as is shown in my patent already mentioned, or to a suction-elevator, such as is used with the

form of apparatus shown in patent to me of October 23, 1883, No. 287,033. When mounted upon a car, the air-blast may be supplied through conduit E by the air-compressing engine H and its boiler H', placed upon the same car.

In Fig. 4 my invention is shown as taking the grain from the hold of a vessel, J, and delivering it into the chute K of an elevator building, L. This chute may convey the material to the hopper M, from which it may be lifted to the upper part of the building or into connection with the discharge-pipe N, by which the car O may be loaded. If the grain is to be transferred directly from the vessel J to car O, then the conduit A³, instead of being extended to chute K, is simply carried to the inside of car O.

In loading cars and vessels, especially when done through the roof or deck, a very convenient device for directing the flow so the grain may be evenly distributed and leveled without shoveling by hand will be found in the discharge-nozzle P. (Shown in Figs. 2 and 4.) Being provided with a globular enlargement, P', held in a globular shell, P², like the globe and shell A⁴ of Fig. 1 inverted, the nozzle can be given a wide range of movement, and the grain directed to any part of the room being filled.

The discharge-pipe N may be supported from the building by a swinging bracket, S, so that when not in use it may be turned flat against the wall.

The dotted lines in Fig. 4 indicate the range of movement permitted to the grain-nozzle, and the arrows in all the figures show the direction of the blast.

When the inlet-nozzle pipes are properly supported by the spring or balance-weight, the nozzle may be guided by a gentle hand-pressure into the grain, and by giving it a circular pendulum-like motion the drawing up of the grain will be greatly facilitated. The operation need be no more severe on the attendant than the use of a broom.

I claim—

1. The combination, in a pneumatic grain-transfer apparatus, of the grain-pipe A⁶ A⁷ and nozzle A, made of metal and connected by flexible joints, as set forth, with the air-pipe C c and its flexible or hose connections C¹⁰, substantially as specified.

2. The combination, with the inlet-nozzle and the air-jet and their connecting-pipes, of the counterbalance-weight, substantially as specified.

3. The combination, with the inlet-nozzle and jet and their connecting-pipes, of the rotative post, to which said pipes are joined, substantially as specified.

4. The combination, with the inlet-nozzle and jet and their connecting-pipes, of the post to which said pipes are joined, said post forming part of the air-conduit supplying the jet, substantially as specified.

5. The combination, with the post, of the grain-pipe A⁶ A⁷, pivoted to the post at A¹⁰, and the hose-section A⁹, connecting said pipe to the discharge-pipe, substantially as specified. 5
6. The combination, with the car R, of the post supporting both grain and air pipes, as set forth, and an air-compressing engine connected to said air-pipes, substantially as specified.
- 10 7. The combination, with a rotative post, of the globe-jointed discharge-conduit, substantially as specified.
- 15 8. The post C², the grain-feed pipe, and the grain-discharge pipe communicating with said feed-pipe and joined to the post by a globe-joint, in combination with blast-producing apparatus, substantially as specified.
- 20 9. In a pneumatic transfer grain apparatus, a rigid horizontal grain or air pipe pivotally joined to its support, so as to swing up and down, and consisting of two or more flexibly-joined sections, in combination with a companion air or grain pipe, substantially as set forth.
- 25 10. In a pneumatic transfer grain apparatus, a rigid horizontally-projecting grain or air pipe embodying one or more flexible joints, in combination with a flexible companion air or grain pipe supported by said rigid pipe, substantially as set forth. 30
11. In a pneumatic grain-transfer apparatus, a rigid horizontally-projecting grain or air pipe pivotally joined to its support, so as to be capable of up-and-down motion, and a companion air or grain pipe, in combination with a flexibly-joined inlet-nozzle and air-jet, substantially as set forth. 35
12. The grain-pipes shown, consisting of metal sections united by flexible joints, one of said joints being a horizontal face-flange joint to give horizontal movement, and another a globe-joint, substantially as set forth. 40
13. In pneumatic grain-transfer apparatus, the combination, with a rigid horizontal grain-pipe and its support, of the pendulous pipe A, suspended from said horizontal pipe by a globe-joint allowing it to swing in any direction, substantially as specified. 45

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Witnesses:

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