

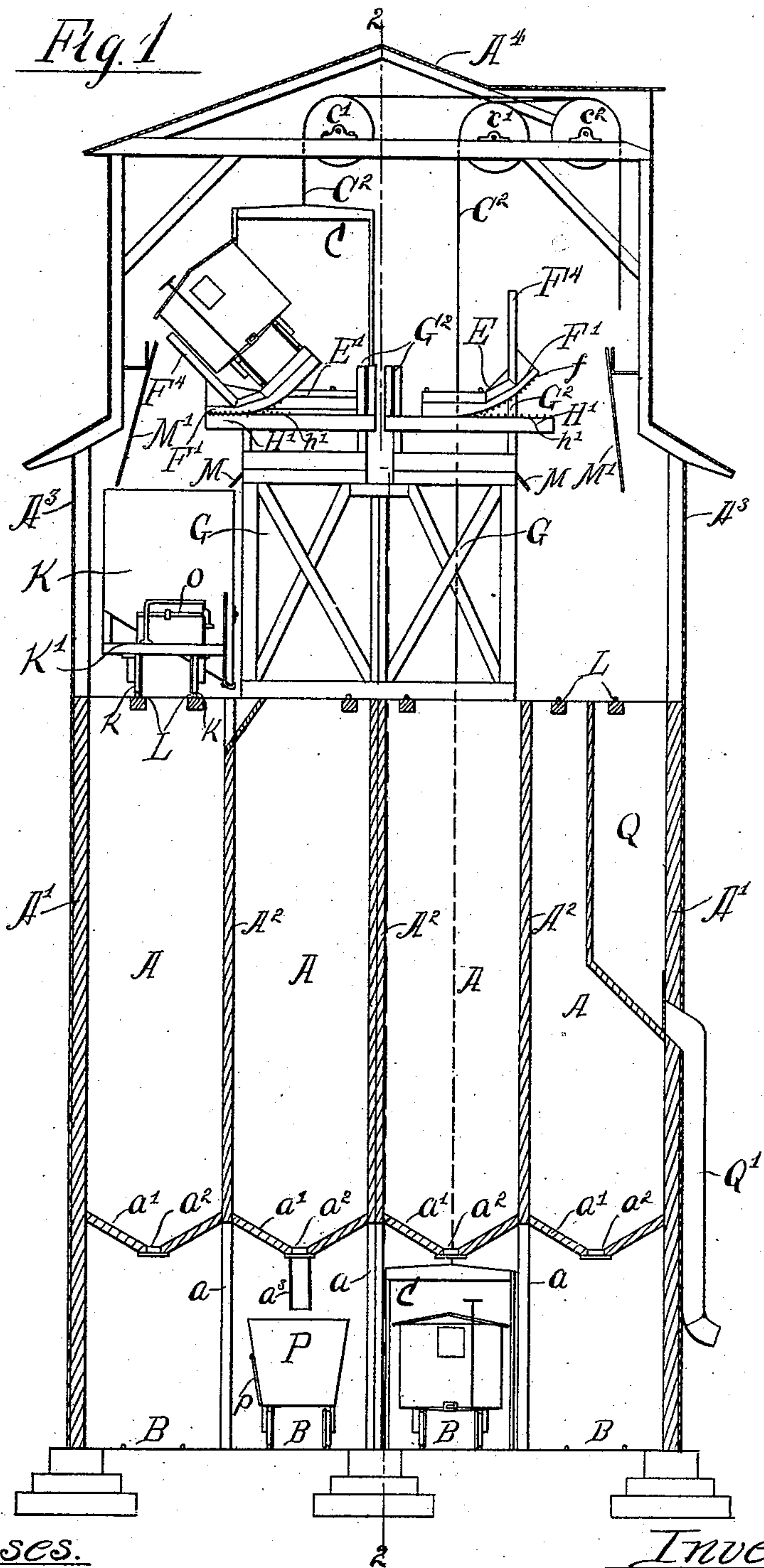
(No Model.)

4 Sheets—Sheet 1.

M. F. & J. Y. SEELEY.  
GRAIN STORAGE ELEVATOR.

No. 572,726.

Patented Dec. 8, 1896.



Witnesses.

Clifton Hamlin  
Leif Teale

Inventors  
Marquis F. Seeley  
Jennie Y. Seeley

by: Clayton. Poole & Brown

Attys

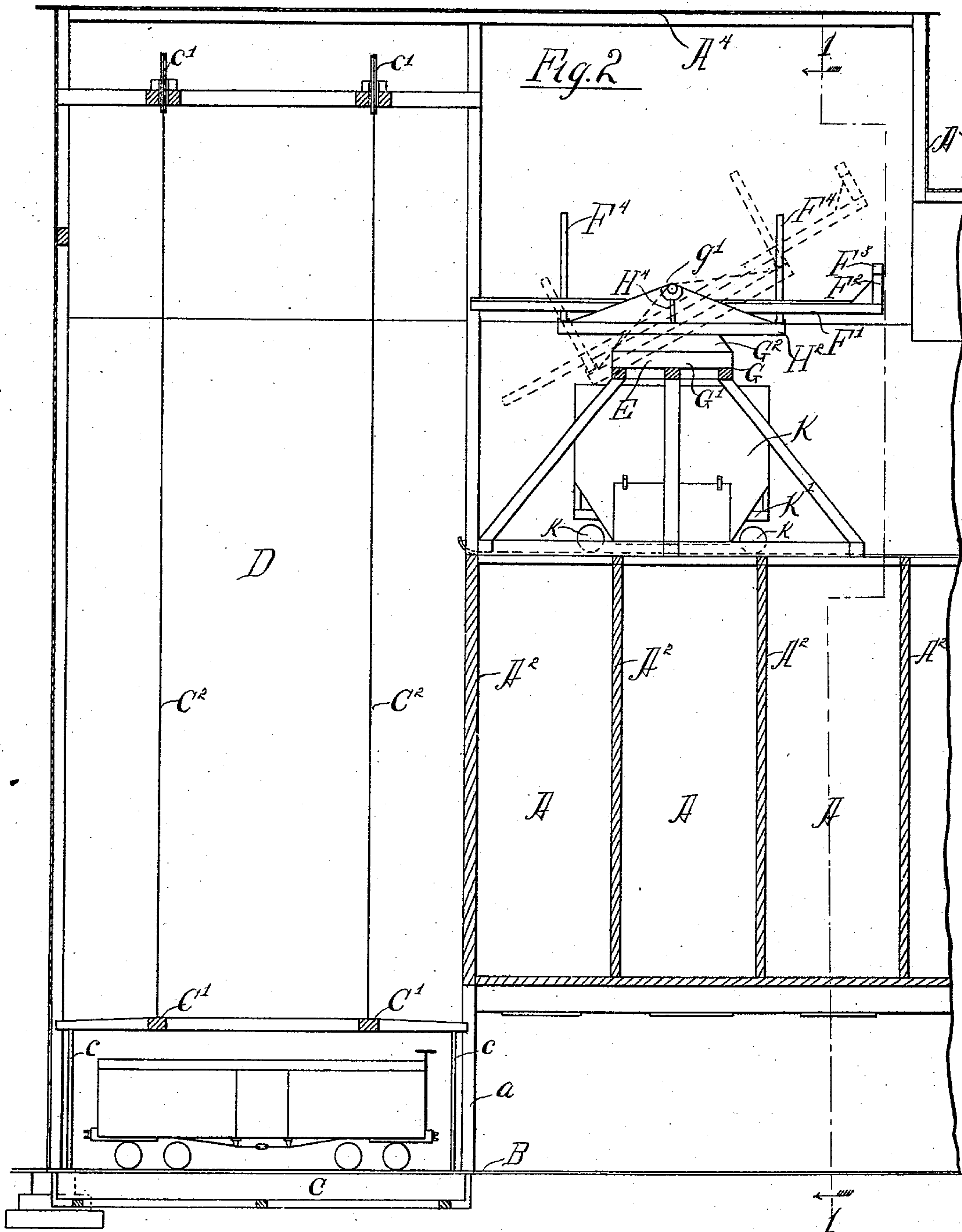
(No Model.)

4 Sheets—Sheet 2.

M. F. & J. Y. SEELEY.  
GRAIN STORAGE ELEVATOR.

No. 572,726.

Patented Dec. 8, 1896.



Witnesses.

Wm. M. Rhum.  
Clifton Hamblin

Inventors

Marquis F. Seeley  
Jennie Y. Seeley

by Wayton, Poole & Brown

Attys

(No Model.)

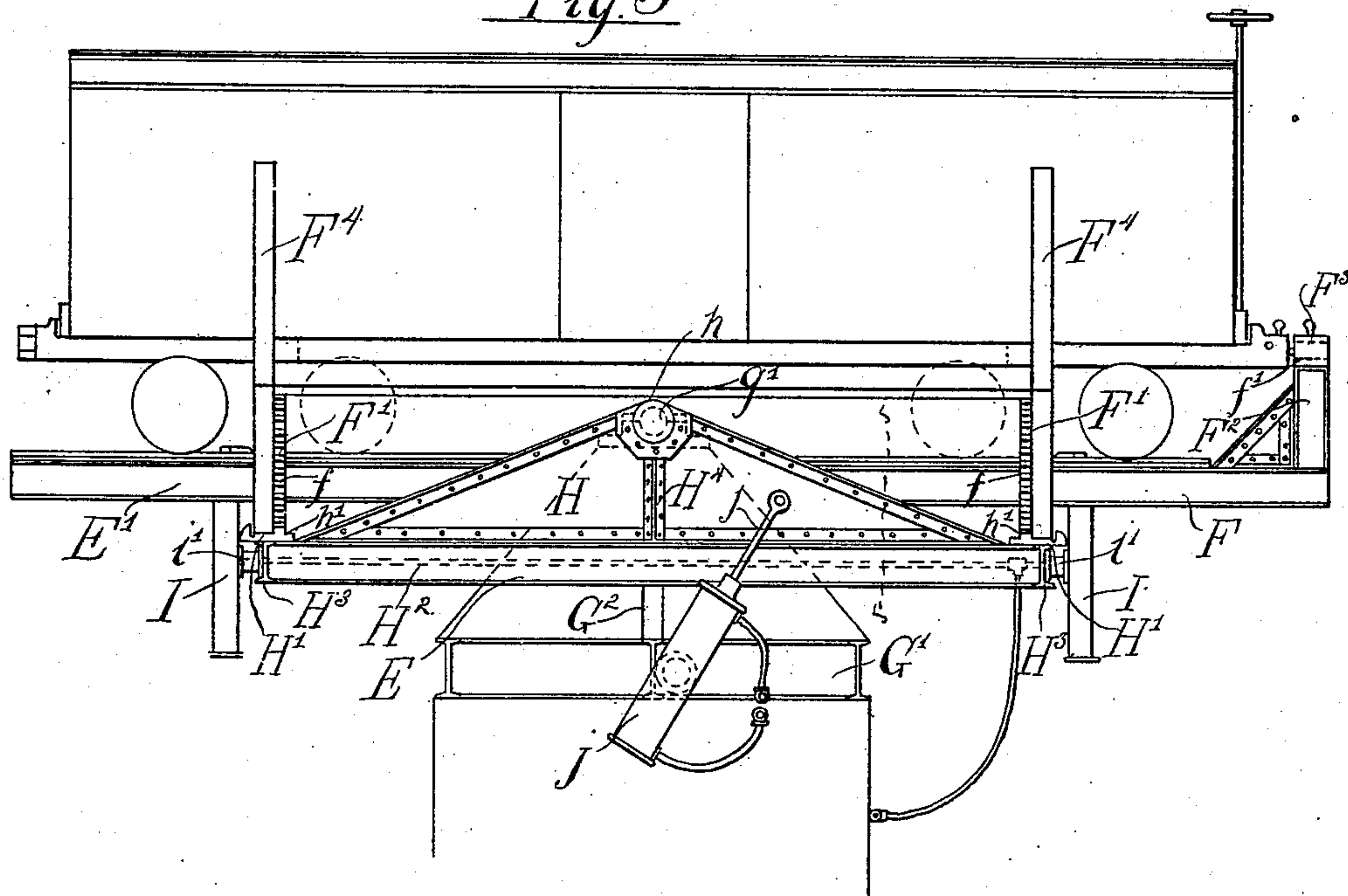
M. F. & J. Y. SEELEY.  
GRAIN STORAGE ELEVATOR.

4 Sheets—Sheet 3.

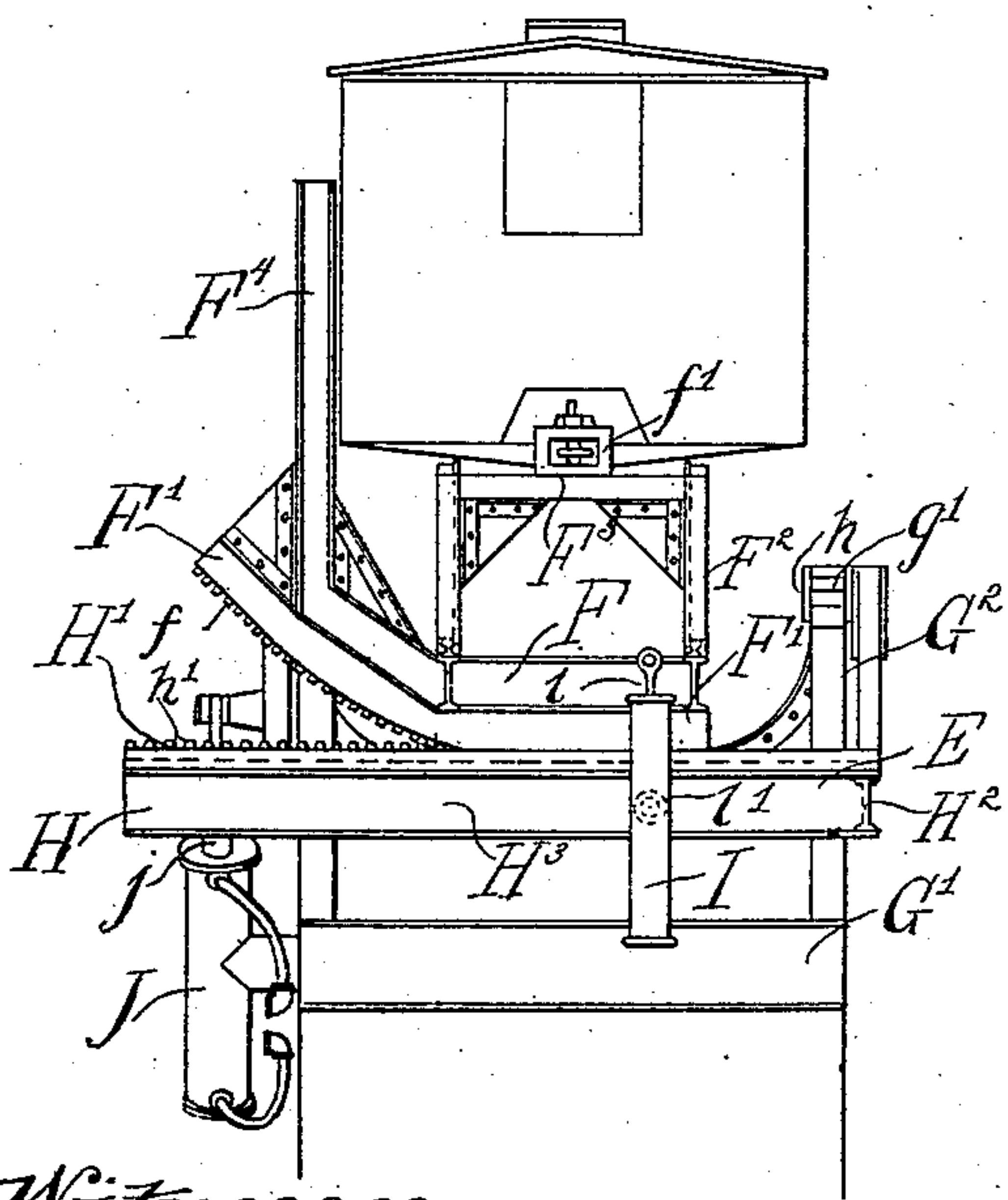
No. 572,726.

Patented Dec. 8, 1896.

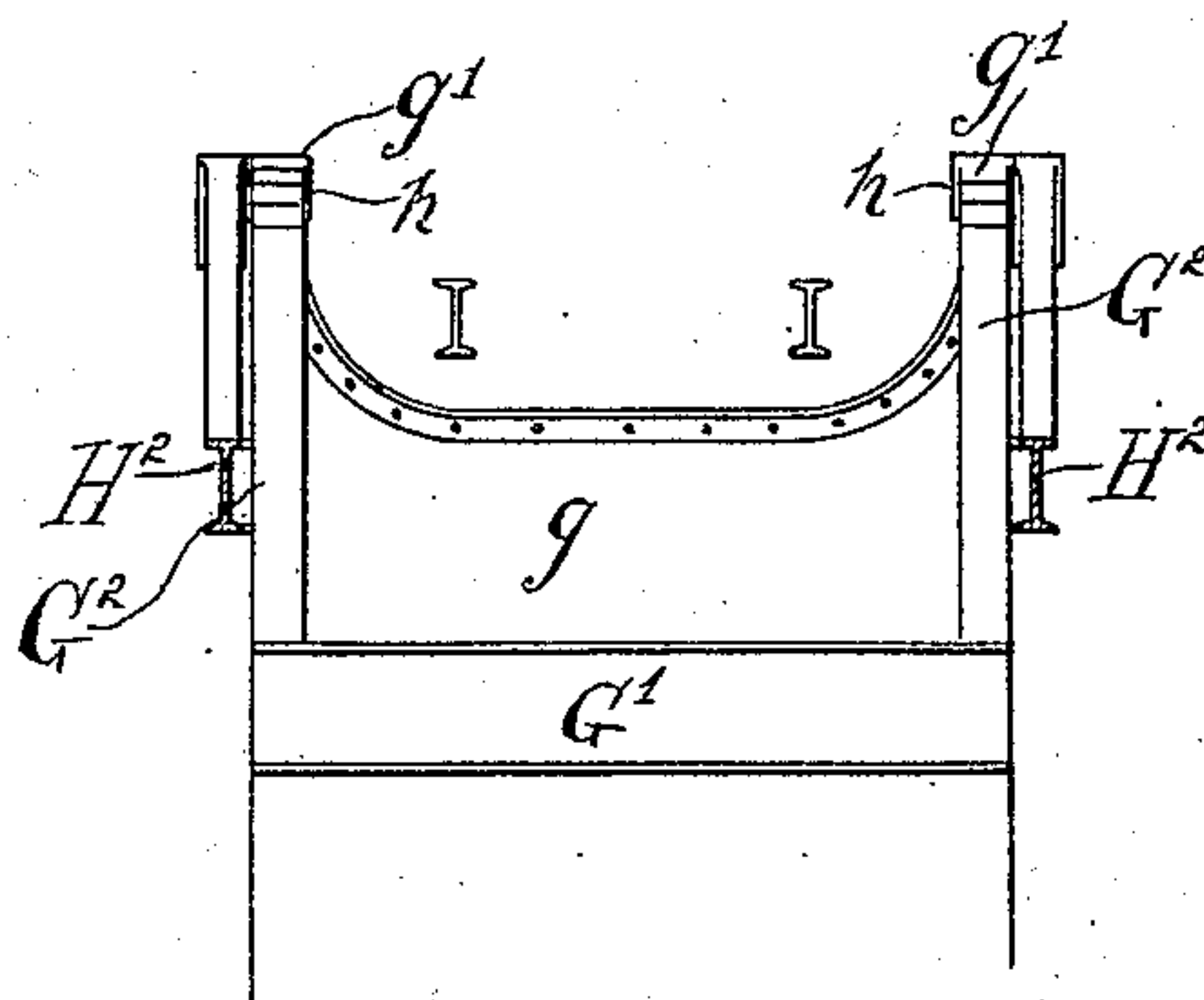
*Fig. 3*



*Fig. 4*



*Fig. 5*



*Witnesses.*

*Wm. M. Rhein.*  
*Clinton Hamlin*

*Inventors*  
*Marquis F. Seeley*  
*Jennie Y. Seeley*

*by: Clayton, Poole & Brown*

*Atty's*



(No Model.)

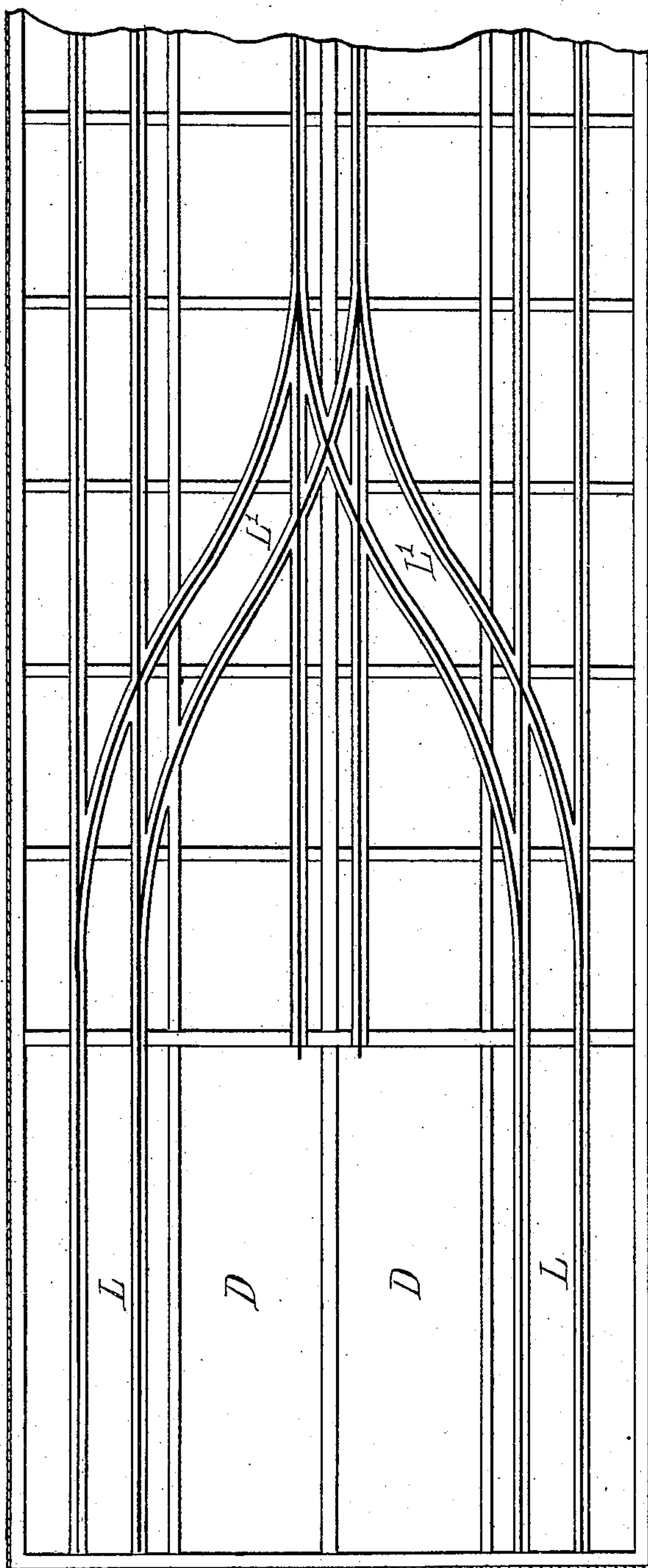
4 Sheets—Sheet 4.

M. F. & J. Y. SEELEY.  
GRAIN STORAGE ELEVATOR.

No. 572,726.

Patented Dec. 8, 1896.

Fig. 6



Witnesses.

Wm. M. Phelps  
Clifton Hamilton

Inventors

Marquis F. Seeley  
Jennie Y. Seeley

by Clayton, Poole & Brown. Attys



# UNITED STATES PATENT OFFICE.

MARQUIS F. SEELEY AND JENNIE Y. SEELEY, OF CHICAGO, ILLINOIS.

## GRAIN-STORAGE ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 572,726, dated December 8, 1896.

Application filed August 8, 1894. Serial No. 519,764. (No model.)

*To all whom it may concern:*

Be it known that we, MARQUIS F. SEELEY and JENNIE Y. SEELEY, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Grain-Storage Elevators; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in storage-houses for grain, or what are commonly known as "grain-elevators," and more particularly to devices adapted for use in connection with the storage receptacles or bins of such houses for handling the grain in receiving and shipping the same or for transferring it from one to the other of several bins or receptacles.

A grain-handling apparatus embodying our invention consists in its principal features in a lift or elevator-platform by which a car loaded with grain may be carried from the level of the ground to a point above the tops of the storage-bins, a dumping-platform or tipple also located above the tops of the bins and adapted to receive loaded cars from the elevator-platform, a wheeled hopper or receptacle adapted to receive the grain when discharged from the car by the use of the tipple, and railway-tracks located above the level of the tops of the bins on which the wheeled hopper is adapted to run and along which said hopper may be shifted to a point over any one of the bins in the building, so as to discharge the grain directly therein.

The features above described alone constitute a means for receiving grain from railway-cars, but for the purpose of transferring from one bin to another and for shipping or loading into a car or vessel from either bin the same device may be used in connection with the usual arrangement of railway-tracks and discharge-spouts at the lower ends of the bins, so that grain may be discharged from either bin into a car or hopper placed on the elevator-platform and thereby lifted to the tipple, in case it is a car of ordinary construction, or to the railway-tracks in case it is a hopper-bottomed or self-discharging car, it being of course understood in this connection

that in loading cars or vessels the grain will be discharged into a bin the bottom of which is located a considerable distance above the ground and which is provided with a discharge-spout through which grain may be conducted to a car or into the hold of a vessel.

The invention may be more readily understood by reference to the accompanying drawings, in which—

Figure 1 is a view in cross-section of a storage structure embodying our invention, taken on line 1 1 of Fig. 2. Fig. 2 is a longitudinal vertical section of the same, taken on line 2 2 of Fig. 1. Fig. 3 is an enlarged detail side elevation of the dumping device or tipple. Fig. 4 is an end view of the same. Fig. 5 is a detail cross-section taken on line 5 5 of Fig. 3. Fig. 6 is a plan view of the elevator structure, showing the track-rails and bins, but omitting the parts above the same.

As shown in said drawings, A A A indicate the storage-bins, which are formed in the usual manner by outer walls A' A' and intermediate walls or partitions A<sup>2</sup> A<sup>2</sup>. The outer walls A' are shown as extending to the ground, and the intermediate walls A<sup>2</sup> are supported on posts *a a*, said intermediate walls or partitions terminating at the level of the bottoms *a' a'* of the bins in the usual manner. Said bottoms are made of hopper shape and provided with exit-openings *a<sup>2</sup> a<sup>2</sup>*, through which grain may be discharged through suitable spouts, or otherwise, into cars located on the tracks B B, extending beneath the bins. Above the level of the bins is formed a housing or inclosure consisting of side walls A<sup>3</sup> A<sup>3</sup> and a roof A<sup>4</sup>, such housing serving to inclose and protect the apparatus by which the grain is delivered to the bins, as heretofore common in similar structures.

To now refer to the novel features of construction embodying our invention, the storage house or structure is provided with a power-lift or elevator having two vertically-movable cars or cages, (indicated by C C in Fig. 1,) the same being adapted to move vertically in shafts or passages D, located in one end of the elevator structure. Said cars may be actuated by any suitably-applied hoisting device, such, for instance, as hydraulic machinery commonly used for freight and passenger elevators. As herein shown, the cars



C C consist of platforms connected by tie-rods  $c c$  with overhead frame-bars  $C'$ , to which are attached hoisting-ropes  $C^2 C^2$ , which pass over guide-pulleys  $c' c'$  at the upper ends of the shafts and thence over other guide-pulleys  $c^2 c^2$  to the hoisting-engine. When two elevator cars or platforms are employed, as shown, they will commonly be arranged to counterbalance each other by means of the cables shown or other suitably-arranged connecting-cables passing over pulleys at the top of the building, so that the weight of an empty car resting on one platform could be utilized to aid in lifting the loaded car on the other platform, an obvious advantage of this construction being that the weight of each descending car is utilized to lift an ascending car, so that the work done by the hoisting-engine is that of elevating only the grain with which the ascending car is loaded. When the platform C is at the lower end of its movement, the tracks with which it is provided are at the level of the ground and in alinement with the track-rails of the railway over which loaded cars are brought to the elevator, so that loaded cars may be run directly upon the elevator-platform, which latter is made of such size and length as to easily receive railway-cars of the size ordinarily employed.

E E indicate as a whole two dumping devices or tipples which are located at the upper part of the elevator structure at a considerable distance above the tops of the bins and adjacent to the elevator-shafts. The platforms  $E' E'$  of said tipples are located on the same level or approximately the same level with the elevator-platform when the latter is at the upper limit of its movement, so that cars may be transferred from said elevator-platforms  $E' E'$  to the tipples. The transfer of the cars from the elevator-platforms to the tipples may either be direct or through the medium of an intervening stationary section of track, the result being the same in either case.

For simplicity of construction we have herein shown the tipples as located adjacent to the elevator-shafts without any intervening tracks, the ends of the tipple-platforms being arranged to reach the sides of the shafts, so that they extend to the elevator-platform, and the cars may be run directly from the track-rails on the platforms of the elevators to those on the platforms of the tipples.

Each of the tipples referred to is constructed as follows: G indicates as a whole a supporting-framework which rests on the upper edges of the partition-walls of the bins and which supports the tipple at a considerable distance above the same. On the top of the said framework rests a horizontal metal frame or platform  $G'$ , at each side of which is a rigid standard  $G^2$ . The platform  $G'$  and standards  $G^2 G^2$  are preferably made of rolled-metal girders and plates, and lat-

eral stiffness is given to the standards by means of a connecting brace or braces, herein shown as having the form of a transverse plate  $g$ , stiffened by angle-irons at its upper edge. At the upper ends of the standards  $G^2 G^2$  are formed journal-bearings  $g' g'$ , adapted to receive short axles or journals  $h h$ , which are attached to a swinging frame H, by which the tipple-platform F is supported. The pivotal axis on which the said frame H swings is arranged at right angles to the track-rails on the platform F, so that when said frame H is swung about said pivotal axis the ends of said platform will be raised or lowered. Furthermore, said platform F is mounted on the frame H in such manner that the platform may be tipped or inclined laterally, the device herein shown for this purpose consisting of transversely-arranged curved supporting bars or rockers  $F' F'$ , attached to the platform F and adapted to rest and roll on transverse ways  $H' H'$  on the frame H. This construction of the parts which support the tipple-platform obviously will permit a car resting on said platform to be tipped in two directions, namely, both endwise and sidewise, thereby providing means by which all of the grain in an ordinary box or grain car may be discharged from one side door thereof, it being obvious that if the car be first tipped sidewise by the tilting of the platform F on its longitudinal axis a considerable part of the grain will flow through the central door, and that if while the car is thus held in a sidewise-inclined position the frame H is then swung on its pivotal axis, so as to first lower one end and then the other end of the car, the grain remaining in the ends of the car after it has been tipped sidewise will be discharged or poured from the central door.

It is of course understood that the two movable parts of the tipple, namely, the platform F and the frame H, can be so arranged as to permit an inclination of the car sufficient to insure the discharge by gravity of practically all the grain therein.

The frame H of the tipple is shown as consisting of two longitudinal side pieces  $H^2 H^2$ , which extend outside of the supporting-standards  $G^2 G^2$  and which are connected at their ends by cross-pieces  $H^3 H^3$ . On these cross-pieces  $H^3 H^3$  rest the tracks or ways  $H' H'$ . Said cross-pieces  $H^2$  are extended at one side of the frame H a considerable distance past the frame-piece H in order to afford proper support for the outer end of said ways  $H'$ . The pivot studs or journals  $h$  are preferably located at a considerable distance vertically above the longitudinal side pieces  $H^2$  of the frame, and said studs are connected with the said side pieces by vertical ribs  $H^4$ , which are suitably stiffened by angle-irons, and which are preferably extended throughout practically the full length of the frame, so as not only to afford connection between the pivot-studs and frame, but to give longi-



tudinal stiffness to said frame. The location of the pivot-studs above the main part of the frame H on which the ways H' H' are supported brings the pivotal axis on which the platform F and the car swing at a point near the bottom of the car, and therefore much nearer the center of gravity of the platform and car than would be the case were the pivotal axis located at a level with or below the said platform. The platform F, furthermore, is arranged to rest directly on the transverse supporting bars or rockers F', so as to bring the track-rails as low as possible and the center of gravity of the car and platform as near as possible to the center of curvature of said rockers, it being obvious that if the center of gravity of said parts were coincident with the center of a circular curve conforming to the bearing-surface of the rockers such center of gravity would be neither raised nor lowered, but would move in a horizontal line in tipping the car and platform laterally, and this work could then be accomplished by a minimum effort. In practice we propose to make the curvature of the said rockers such as to bring the center of curvature as near as practicable to the center of gravity of the car and platform. By bringing the platform F as near as possible to the bottom of the said rockers, furthermore, we are enabled to bring the center of gravity of the car and platform much nearer the transverse pivotal axis of the frame H than would be the case were the said platform elevated a considerable distance above the main part of said frame. As will be clearly seen from Figs. 4 and 5, the arrangement of the pivots or journals h h above the level of the platform F and frame H makes it necessary that the supporting-standards G<sup>2</sup> G<sup>2</sup> should rise between the frame-bars of the platform and the side bars H<sup>2</sup> H<sup>2</sup> of the frame H. This construction, however, is unobjectionable and does not interfere with the tipping of the car, because the said standards G<sup>2</sup> G<sup>2</sup> and the elevated parts of the frame H come opposite the center of the car and between the wheels thereof, so that the car-body passes over said standards and elevated parts when the car is tipped laterally, as clearly seen in Fig. 4.

In order to maintain the platform F at all times in the same relation to the frame H, which supports it, both the rockers F' and the ways H' are provided with gear-teeth h f, which remain constantly in mesh with each other and prevent any lateral movement, slipping, or shifting of said platform relatively to the frame. The rockers F' are provided with flat or straight portions extending from a point beneath the center of the platform to the side of the platform opposite that at which a curved part of the rocker is located, such straight parts serving as a stop to limit the backward movement of the car when the platform is being restored to its horizontal position and preventing the tipping of the

platform in the wrong direction. Similar straight parts or surfaces at the outer ends of the rockers serve to limit the tipping of the car when inclined, and thus avoid possibility of the platform F becoming dislodged from its place on the platform H.

To hold the car on the tippable-platform F when operating the latter, we have provided devices as follows: At the end of the said platform remote from the elevator-shaft we place two strongly-braced uprights F<sup>2</sup> F<sup>2</sup>, which are connected by a cross-piece F<sup>3</sup>, carrying a coupling-block f', which is provided with a coupling-pin or other means corresponding with those commonly employed on cars, by which the car may be engaged with the coupling-block in the same manner that it is coupled to an adjacent car on a train. The standards and cross-piece in themselves hold the car from endwise movement when that end of the platform at which these parts are located is depressed, and the coupling devices hold the car from moving toward the opposite end of the platform when such opposite end is lowered. To hold the car from tipping sidewise under the action of gravity when the tippable-platform is laterally inclined, we have provided two rigid standards F<sup>4</sup> F<sup>4</sup>, which extend upwardly to the sides of the car in position to engage the same upon a very slight movement thereof from its central position on the car-tracks. If desired, blocks or wedges may be inserted between the standards and the sides of the car after the car is in place on the platform, but commonly this will not be necessary. The standards F<sup>4</sup> F<sup>4</sup> are shown as rising from and as being attached to the supporting-rockers F' of the platform F.

The two movable members of the tippable described, namely, the platform F and the frame H, may be moved by any suitably-applied actuating device adapted for operation either by hand or power. As a simple and convenient means of effecting such actuation of the parts of the tippable we have shown hydraulic cylinders I and J, arranged to operate the platform F and frame H, respectively. Such hydraulic cylinders when employed may be supplied with water under pressure from the same power plant by which the elevator-platform is actuated. We have shown in the drawings a hydraulic cylinder I arranged at each end of the frame H and as provided with a piston i, connected with a cross-piece on the frame F in such manner that the outward or upward movement of the piston-rods will lift the inner edge of the platform, and thereby turn or rock the same on the rocking bars F', the cylinders I being conveniently mounted on pivotal supports i', so that they may swing or oscillate to maintain their alinement with the pistons. The piston J is shown as pivoted to the frame G' and its piston-rod j as pivotally connected with the frame H at one side of the pivot-axis of the same, the said



cylinder J in this instance serving to swing the frame in either direction from its central or horizontal position.

The two dumping devices or tipples referred to are arranged side by side at the center of the building and opposite the two elevator-shafts, the tipples being arranged to dump in opposite directions and outwardly or toward the sides of the tipples nearest the exterior walls of the building.

To receive the grain discharged from the cars by the operation of the dumping devices described, we provide one or more hoppers K, which rest on a truck K', provided with supporting-wheels *k k*. The truck referred to is arranged to rest and run on track-rails L L, which are located at either side of the tipples at a sufficient distance below the same to bring the top of the hopper in position to receive the grain discharged from the cars on the tipple, and said tracks L L are extended throughout the length of the storage structure, over the tops of the bins thereof, and will be provided with suitable connecting tracks or switches L' L', Fig. 6, by which the hoppers may be transferred from one track to another and thereby carried to a point over any one of the bins into which it may be desired to discharge the contents of the hopper. Guards or shields M M' serve to confine the grain which is discharged from the car-door and insure its delivery to the hopper K. Said hopper is provided with an inclined bottom and with a lateral door or gate by which the grain therein may be discharged by gravity. When necessary to secure the discharge of the grain from the hopper into a bin beneath the track on which the hopper is located, a deflecting-board is provided, as clearly seen in Fig. 1. As far as the transfer of the grain from the dumping device or tipple to the several bins is concerned, the hopper K may be of any preferred construction, but to provide for the weighing of the grain as it is stored we provide a scale attachment, which may either consist of a track-scales applied to a section of track on which the hopper rests or a hopper-scales resting on and carried by the track K', which supports the hopper. This latter construction is shown in the drawings, wherein O indicates the scale-beam.

The parts above described obviously constitute a complete device for receiving, weighing, and storing grain, the loaded cars as they are brought to the elevator being placed on the elevator-platform, lifted to the top of the building, shifted upon the tipple-platform, and then tipped or inclined to secure the discharge of the grain from the car-door in the manner above described. The grain as it is discharged from the car is received into the hopper K, is weighed while within the hopper, and the hopper then moved or shifted along the track-rails until above or opposite the bin in which it is desired to store the grain, the grain being then discharged into the bin.

The features of construction described constitute efficient means for transferring or shipping the grain as well as for receiving and storing it. For these purposes we propose to employ a transfer-hopper P, Fig. 1, adapted to run on the track-rails B B beneath the several bins. Said hopper will preferably be open at its top and also have a side door or gate *p*. To transfer the grain from one bin to another by the use of said hopper P, the latter will be placed beneath the bin from which the grain is to be taken and the latter discharged into the hopper through the exit-opening *a*<sup>2</sup>, a spout, as indicated by *a*<sup>3</sup>, Fig. 1, commonly being used to direct the grain into the hopper. The said hopper will then be shifted to one of the elevator-platforms and lifted to the level of the tipple, on which it will be run and its contents discharged therefrom into the weighing-hopper in the same manner as in the case of an ordinary car. By the use of the weighing-hopper, or any ordinary hopper in case it be not desired to use the weighing-hopper for this purpose, the grain may be moved to a desired bin and discharged therein.

For shipping grain from the elevator the same may be conveyed in the manner described to an elevated bin or shipping-pocket Q, having a descending discharge-spout Q', through which the grain may be discharged either into the hold of a vessel or into cars in the manner as heretofore common.

In case it is desired to employ the features of construction described for receiving the grain only, other means may be provided for transferring the grain from one bin to another or for delivering the grain to a vessel or cars in shipping; as, for instance, where the several bins extend downwardly to the ground-level, as is common in some storage-elevators, a horizontally-arranged transfer-belt may be employed for moving the grain horizontally in connection with suitable devices for elevating it, or grain may be conveyed from a storage-bin to another bin or to a car or vessel by pneumatic pressure. It is to be noted, moreover, that the apparatus described, namely, an elevator-platform or hoist, a tipple at the top of the building, and a weighing or transfer hopper running on tracks above the bins, may be employed for transferring and shipping alone when other devices are used for receiving and storing the grain. Furthermore, if the bottoms of the bins are located at the ground-level, short elevators or conveyers may be employed for lifting the grain discharged therefrom and delivering it to cars or hoppers which rest on track-rails at the ground-level, and such cars or hoppers may be lifted to the top of the building in the manner as hereinbefore described.

We claim as our invention—

1. A structure for elevating and storing grain, comprising storage-bins, a vertically-movable elevated platform, a tipple located



above the bins, track-rails also located above the bins but below the tipple, and wheeled hoppers resting on said track-rails for transferring grain from the tipple to the bins, substantially as described.

2. A structure for elevating and storing grain, comprising storage-bins, a vertically-movable elevator-platform, a tipple located above the bins, track-rails also located above the bins but below the tipple, wheeled hoppers resting on said track-rails for transferring grain from the tipple to the bins, and means for weighing the grain when in the hopper, substantially as described.

3. A structure for elevating and storing grain, comprising storage-bins, two vertically-movable elevator-platforms, tipples located side by side above the level of the bins, track-rails also located above the level of the bins, and a wheeled hopper resting on the track-rails, said track-rails being provided with cross connections or switches by which the hopper may be transferred from one track to another, substantially as described.

4. A tipple for grain-cars, comprising a platform provided with curved supports or

rockers, and a frame on which the said platform is supported, which frame is provided with supporting-surfaces on which the said supports or rockers rest, and on which they roll in the lateral tipping of the platform, and means whereby said frame is adapted to swing transversely to the platform, substantially as described.

5. A structure for elevating and storing grain, comprising storage-bins, a vertically-movable elevator-platform, a tipple located above the level of the bins, said tipple comprising a platform which is movably supported in such manner as to tip both sidewise and endwise, track-rails also located above the bins, and a wheeled hopper resting on the track-rails, substantially as described.

In testimony that we claim the foregoing as our invention we affix our signatures in presence of two witnesses.

MARQUIS F. SEELEY.  
JENNIE Y. SEELEY.

Witnesses:

E. Y. LOOMIS,  
CHARLES A. HERTEL.