No. 737,643. PATENTED SEPT. 1, 1903.

J. MABUS & F. L. HAY.

GRAIN CONVEYER.

APPLICATION FILED FEB. 11, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

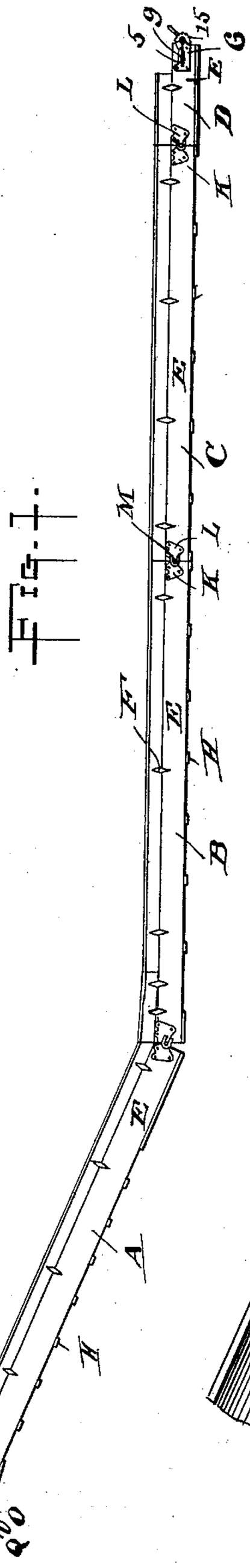

FIG. 1.

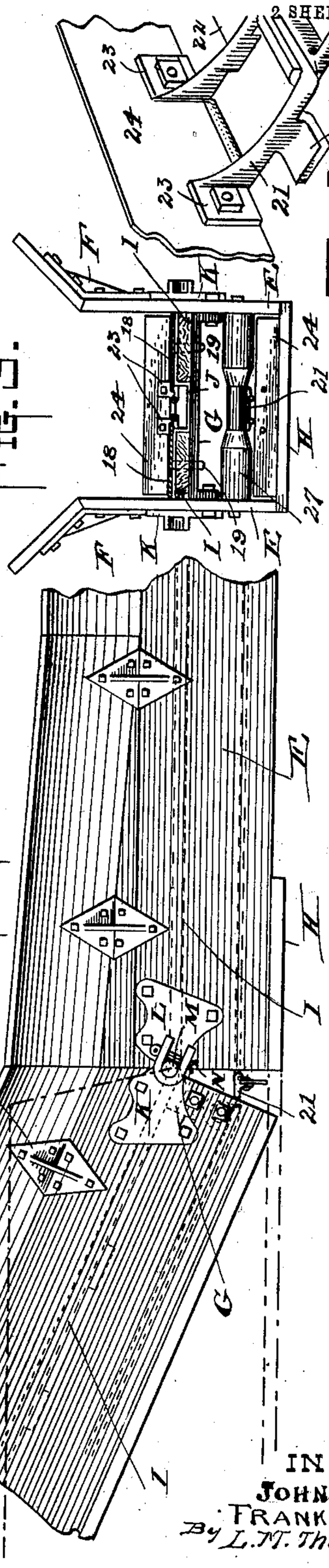

FIG. 3.

FIG. 2.

FIG. 4.

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NO MODEL. 2 SHEETS—SHEET 2.

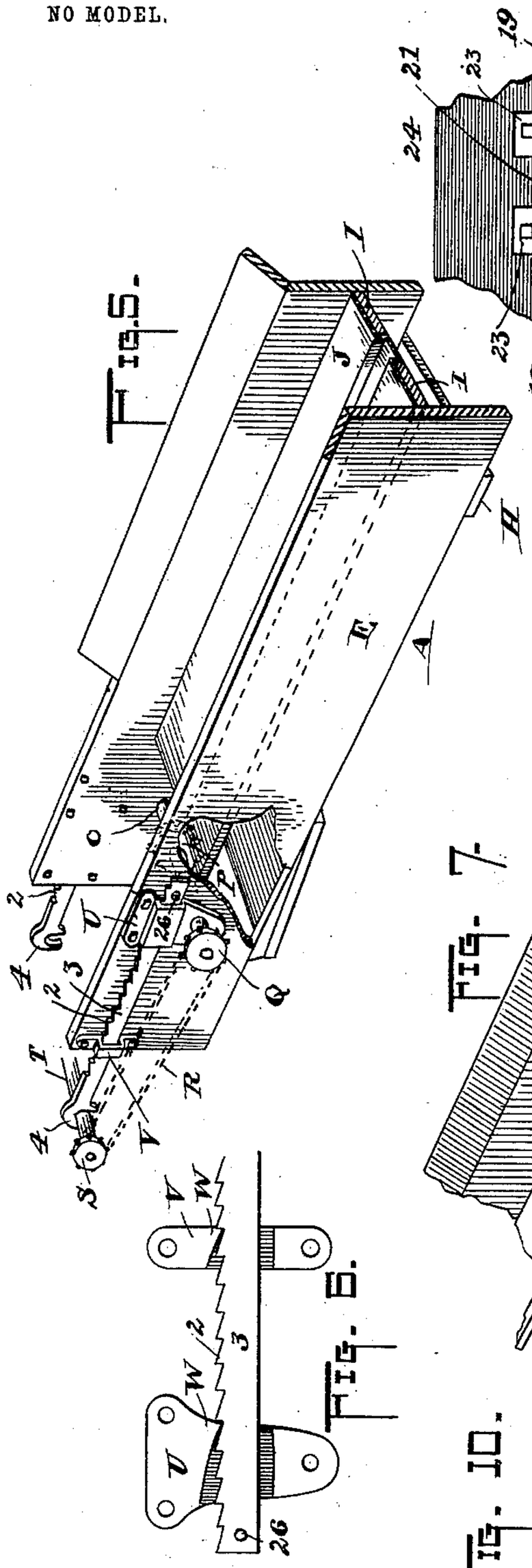

FIG. 5.

FIG. 6.

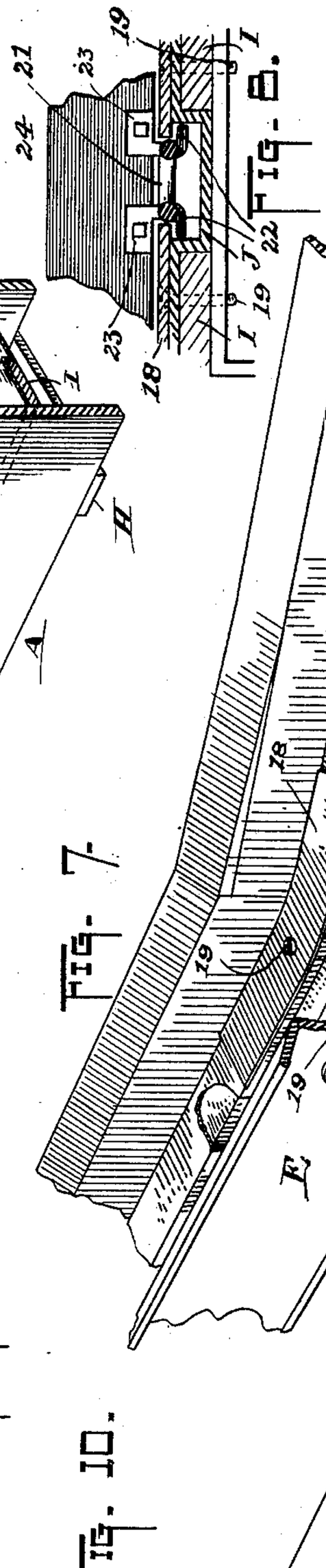

FIG. 7.

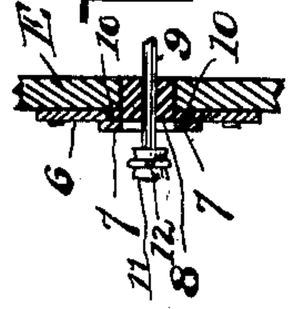

FIG. 10.

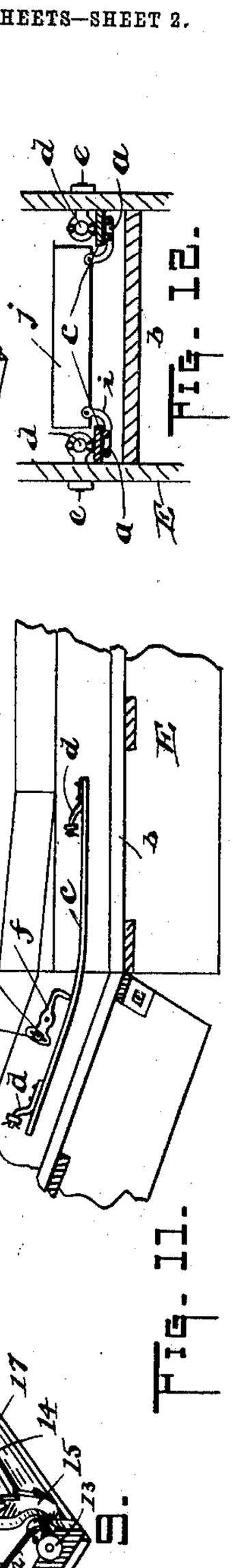

FIG. 12.

FIG. 11.

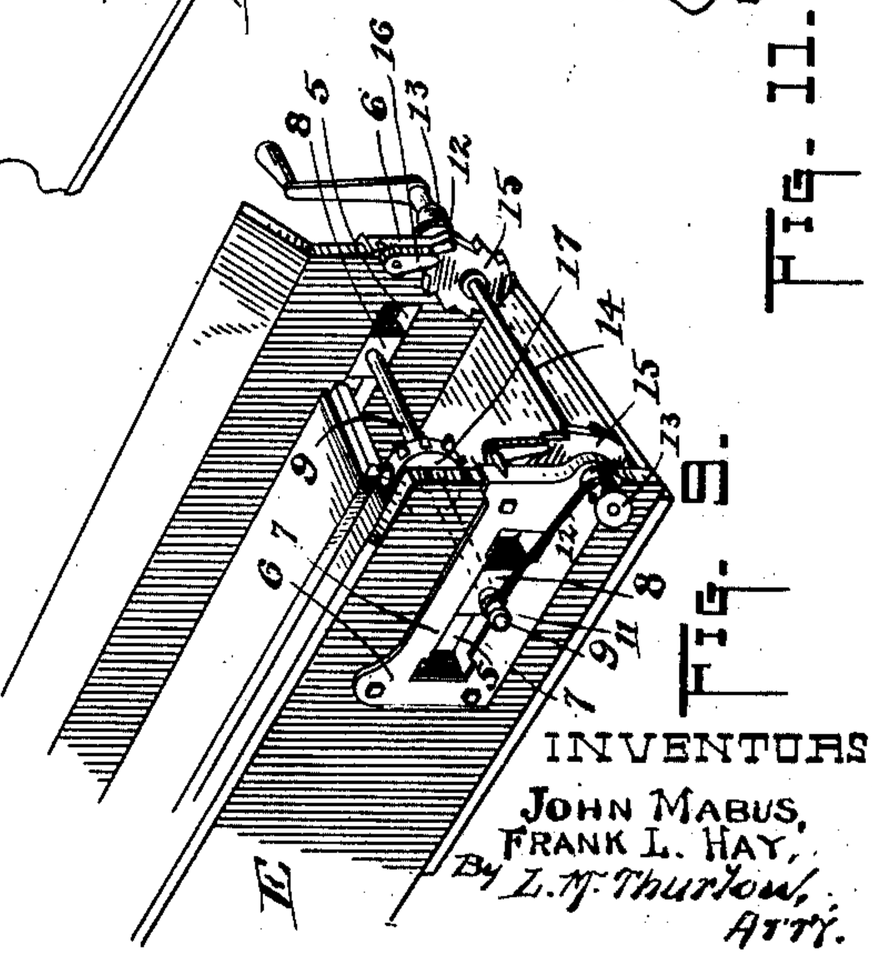

FIG. 9.

WITNESSES

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No. 737,643. Patented September 1, 1903.

UNITED STATES PATENT OFFICE.

JOHN MABUS AND FRANK L. HAY, OF LILLY, ILLINOIS.

GRAIN-CONVEYER.

SPECIFICATION forming part of Letters Patent No. 737,643, dated September 1, 1903.

Application filed February 11, 1903. Serial No. 142,971. (No model.)

To all whom it may concern:

Be it known that we, JOHN MABUS and FRANK L. HAY, citizens of the United States, residing at Lilly, in the county of Tazewell and State of Illinois, have invented certain new and useful Improvements in Grain-Conveyers; and we do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention pertains to improvements in conveyers and elevators for use in handling ear-corn and the like—as, for instance, in conveying ear-corn to the corn-sheller or into bins.

The object of the invention primarily is to construct an improved runway for the chain which carries the grain.

Another and important object is to so construct devices of this nature that much less power will be necessary to operate them than in the older forms.

Still another object is to provide a new chain-tightening arrangement.

In addition to these several objects the invention seeks to employ a new construction and arrangement of various parts of the conveyer and elevator, all of which will be pointed out in the following specification and in the accompanying claims.

In the drawings hereunto annexed, Figure 1 is a side view of the elevator and conveyer. Fig. 2 is a side elevation of a portion of the elevator and a portion of a conveyer attached thereto, this being on a much larger scale than that shown in Fig. 1. Fig. 3 is an end view of the elevator where it joins the conveyer in Fig. 2. Fig. 4 is a partial view in perspective of the conveyer-chain and a drag used thereon. Fig. 5 is a perspective view of the upper end of the elevator, showing attachments for connection with the swivel of the corn-shelling apparatus. Fig. 6 is a back view of a ratchet-bar and fastenings for the same, all being shown in Fig. 5. Fig. 7 is a perspective view of the elevator and conveyer portions shown in Fig. 2. Fig. 8 is a cross-section of the bottom of the conveyer and elevator in part only, showing position of the drag-chain thereon. Fig. 9 is a perspective view of the rear section of the conveyer, showing the chain-tightening apparatus. Fig. 10 is a cross-section of a portion of the side of the conveyer, showing a sliding block and shaft forming part of the chain-tightener. Fig. 11 is a side view of the interior of the elevator and conveyer where they join, showing a modified form of shoe for carrying the chain. Fig. 12 is a cross-section of a portion of the conveyer, showing the device in Fig. 11.

In the figures, A indicates the elevator, and B C D several sections of conveyer connected therewith. All of these sections are made substantially alike and consist, as shown in Fig. 3, of the sides E E, having flaring sides on their top edges held by the angled brackets F or other good means. The said portions E are suitably held against spreading—as, for instance, by means of braces similar to that shown at G in Fig. 3 and also by means of cleats H, secured to the bottom of such portions, as in Fig. 1. The said braces G are placed within the conveyer and elevator about in the position shown in Fig. 3 and may be placed at such intervals as best suited to the needs of these portions. Upon these braces two boards I are placed, each being placed against the sides, as shown in Fig. 3, leaving a space between their adjacent edges. The floor thus formed extends throughout the entire length of all the sections of the conveyer and up the elevator. A sheet-iron covering of the form of cross-section shown at J in Figs. 3, 5, 7, and 8 covers the floor formed by I and extends down between them, as shown, thus forming trough or runway for the drag-chain to be described. The several sections are connected together by means of interlocking plates K and L. The latter is merely a casting bolted to the conveyer, Fig. 2, and has a projecting lug M, which, as shown, has its center coincident with the end of such conveyer and also with the top of the floor I. (Shown in broken lines.) The plate K is similar to L, except that in place of the lug M a forked projection is used which straddles the said lug M, as shown. A split pin N serves to keep these portions locked together, but at the same time permits the parts to pivot on one another. The elevator, Fig. 2, is provided with one of the plates K, which pivots on the plate L, as described, said elevator being cut off at an angle to permit it to be

raised to the position shown, or it may also lie flat, as indicated by the broken lines.

At the upper end of the elevator is a shaft O for carrying the chain. Such shaft is provided with a sprocket-wheel P, so located with reference to the bottom I that its top or periphery is about on a level with the trough or runway formed by the sheet-iron covering J described. The said shaft O is carried in suitable bearings and has a sprocket-wheel Q outside the elevator, which receives a sprocket-chain R, running over a sprocket-wheel S on the corn-sheller shaft T, the latter serving to drive the chain of the elevator, as in usual practice. To the elevator at each side is secured a channeled plate U in the region of the shaft O, while at the extreme end of such elevator is attached a somewhat similar plate V. As shown in Fig. 6, these plates are provided inside with a downwardly-extending lip W, which acts as a lock to the teeth 2 of a ratchet plate or bar 3. The free end of this bar is provided with a fork 4 for straddling the shaft T of the sheller for holding the elevator in position for work, the said lips W of the plates U V serving as the adjustment for the sprocket-chain R, as will be more fully explained presently.

The end of the conveyer (shown in Fig. 9 and represented by D in Fig. 1) is provided with a chain-tightener, which may be understood from the following: The sides E of the conveyer are slotted horizontally at 5, and plates 6, also slotted to correspond, are secured to such sides, as shown, and provided with the lips or flanges 7. Within the slots 5 are placed sliding blocks 8, which form bearings for and carry a shaft 9. These blocks have a flange 10 at top and bottom, which slide between the flanges 7 of the plates 6 and the sides E, as shown plainly in Fig. 10, and serve as the means for guiding the blocks in their back-and-forth movements. The shaft 9 projects at each side beyond the blocks and carries a sleeve or spool 11, to which is secured a cable 12, whose other end is wrapped around a drum 13 at each end of a shaft 14, having bearings at the end of the conveyer within the plates 6, substantially as shown, though, as a matter of fact, other arrangements may be used for carrying said shaft, as desired. The shaft 14 described carries a ratchet-wheel 15 near each end, and a pawl 16 above each serves to hold the shaft against movement at any desired place, as will be understood. A sprocket-wheel 17 on the shaft 9 carries the chain for moving the grain, and the use of the tightener in taking up the slack in said chain will be taken up later on. Since the said chain must run horizontally through the conveyers and then move upward through the elevator at an angle, some means must be provided for holding the chain down to its work at the junction of the elevator with the conveyer-section B. To this end we provide, as shown in the several figures and more particularly in Fig. 7, what we term a "shoe," which is placed at each side of the elevator on the bottom portion I. These portions consist of metal plates 18, made, preferably, of spring metal, which will adjust themselves to the positions of the elevator. These said plates project beyond the edges of the said bottom portion I and sheet-metal covering J and overhang the runway, as shown. A machine-screw 19 is passed through the shoe and the portions beneath and is threaded into the metal brace G, Figs. 3 and 8, and by adjustment of such screw the shoe may be given any vertical adjustment desired to give a shorter or longer curve to the same. It will be seen that since both ends of the shoe bear upon the bottom portions I the middle part through which the screw passes will naturally tend to rise; but the screw holds it down, so that both ends are held firmly down. As shown in Fig. 7, an approach is provided for guiding the chain to the shoe. This consists of a strip of thin metal 20, whose one end abuts against the shoe and the other pointed to a knife-edge and, if desired, thrust through an aperture in the covering J, so that there will be no hindrance to the free passage of the chain. The latter, as shown in Figs. 4 and 8, consists of links 21 of the ordinary form of sprocket-link, having downwardly and outwardly projecting lugs 22 at the middle of such link, and these lugs are designed to pass under the projecting edge of the shoes 18 to prevent the chain rising at the point of juncture of the elevator with the conveyer, as before explained. Every fifth or sixth link is provided with upwardly-extending ears 23, to which are bolted what we term "drags," which are merely metal plates 24, but one of which is shown. It will be seen that but one chain is employed, the lugs 22 of which extend beneath the edges of the shoes, as clearly illustrated in Fig. 8. It will further be seen that by permitting the ears 23 and drag-plate 24 to move along on the portion J when reaching the strips 20 they will rise upon it and pass along to the shoe and up over it without resistance. As illustrated in Fig. 7, said strips 20 also overhang the runway, and the lugs 22 pass thereunder, and a notch 25 in said strips allows the said lugs to drop below the said overhanging edge in case they have accidentally ridden over the top of the same at the start, such notches to be cut back flush with the side of such runway. By this means the chain will never meet with resistance in any way and at the same time will be held down to its work in a perfect manner, and we attach much value to this portion of my invention.

In Figs. 11 and 12 is illustrated a form of shoe employed when a double chain is used. In this case a chain is used at each side of the conveyer and elevator, the same being indicated by *a a* in Fig. 12. In this form also a plain flat bottom *b* only is used, and to the sides E are secured flexible shoes *c*, under which the chains pass. Said shoes consist of the plates just mentioned, to each

end of which is secured a bent pin *d*, adapted to enter the eyes of the bolts *e*, secured in the said sides E. Near the middle of the plate, secured to the said sides E in pivotal manner, is a dog *f*, one end of which bears down upon the shoe and the other end being slotted to receive a bolt *g* and nut *h*. By loosening the nut the dog may be adjusted to depress or release the shoe, and the nut then on being tightened holds the dog, and consequently the shoe, wherever desired. The chains are provided with upwardly-extending ears *i*, to which the drag-plate *j* is secured.

The office of the ratchet-bars 3, in conjunction with the chain-tightener, will now be described. After placing said bars 3 upon the support on the sheller—*i. e.*, the shaft T—the sprocket-chain R is placed upon the wheels Q and S. Then the elevator is drawn away from the sheller until the said chain is sufficiently tight to run properly, and then the upper end of said elevator is permitted to drop, thus carrying the lips W of the plates U and V into the notches of said bar 3 to engage the teeth of the latter. Now by turning the shaft 14 of the chain-tightener in a direction to wrap the cable 12 upon it the shaft 9, carrying the chain, is caused to move away from the shaft O at the top of the elevator, thereby taking up all slack in said chain. Then by means of the pawls 16 the shaft 14 is securely held against movement, as also is the shaft 9 as against backward shifting, which would loosen the chain. A pin 26 in the rear end of the bars 3 prevents their slipping out of the plates U, as shown in Figs. 5 and 6.

In Fig. 2 the elevator-chain is indicated by broken lines, a portion thereof, however, showing in full lines at the opening between the elevator and conveyer, and since some means must be provided for holding the chain as it runs beneath the bottom I a roller 27 is provided at the extreme lower end of the elevator under which said chain passes, said roller being of such a form as to keep the chain in the middle of the conveyer, as indicated in Fig. 3.

The advantage in the use of the plates K and L is that any number of the sections of conveyer may be connected together in a few moments, and the drag-chain may be lengthened to correspond. Said plates form a firm connection for these said sections and at the same time permit of easy and quick detachment. Another advantage of such plates is that since the pivots thereof are located just on a line with the juncture of the bottom portion I I of the sections the latter may be raised up or down—as, for instance, in the case of the elevator-section—without changing the relative positions of said portions I I.

The metal covering J covering the portions last mentioned prevents the corn dropping through to the ground, although it is quite evident that a board or metal covering could be attached to the bottom of I I and the same end will be accomplished, since it is not desired to confine ourselves to a stated structure in producing our device.

Having described our invention, we claim—

1. In a conveyer comprising a plurality of sections to be detachably connected for the purposes described, a plate L attached to one of the said sections at the end thereof, an outwardly-extending lug M the center of the same being horizontally in line with the top surface of the conveyer-bottom, and a plate K on the adjoining section of conveyer, a forked projection on said plate K for straddling the said lug M as shown and described, the opening of the fork being in line horizontally with the end of the conveyer-bottom to permit said conveyer-sections to pivot on the other without separation of the said conveyer-bottoms as set forth.

2. In a conveyer and elevator section adapted to pivot one on the other the pivot-point being at the point of meeting of the adjacent section-bottoms, a channel in the bottoms of each section for the passage of the conveying-chain, and a flexible plate overhanging each side of the channel for holding the chain in said channel, said plate secured to one of the sections and adjustable vertically thereon while movable upon the other in its flexing by the pivotal movement of said sections as set forth.

3. In a combined elevator and conveyer of the character described, the former adapted to pivot on the latter to incline it at any desired angle, a bottom for each portion, the said bottom of each adjoining one another regardless of the angle of inclination, and consisting of two separated portions having a space between them substantially as described, said space being closed at the bottom to form a channel for the purposes set forth, and adjustable shoes secured to the bottom portions and projecting over the channel at each side, the same being flexible and arranged to move with the elevator in the adjustment thereof.

4. In a combined elevator and conveyer of the character described, the sides thereof abutting at their ends and pivoted together for the purposes explained, a bottom for each comprising two separated portions, there being a space between such portions, such space being closed at the bottom to form a channel, and flexible overhanging plates secured to the said bottom portions for overhanging the said channel in combination with a drag-chain for such elevator and conveyer adapted to be held down by the passage thereof under the said overhanging plates substantially as described.

5. In a combined elevator and conveyer, the sides E of each, the bottom portions I I arranged substantially as described there being a space between them, the sheet-metal covering J therefor to form a channel, the pivots on both the said elevator and conveyer the same arranged to permit the portions to pivot

at the point of juncture of the bottom portions I I, and the flexible plates 18 mounted upon the said portion I to overhang the channel as described and extending within the elevator and conveyer in both directions from the point of juncture of the said portions I in combination with the drag-chain adapted to pass partially under the projecting edges of the said plates for the purposes explained, the plates adapted to flex with the movement of the elevator in being raised or lowered.

6. In combination with a corn-sheller, the elevator, the drag-chain therefor, a shaft at the head of the elevator for carrying said chain, a sprocket-wheel on the outer end of said shaft, a sprocket-wheel on the corn-sheller, a sprocket-chain connecting the two wheels, adjusting-plates secured to the sides of the elevator, a ratchet-bar having teeth for engaging the said plates the free ends of such bars adapted to engage with the corn-sheller all for the purposes set forth and described.

7. In an elevator, the drag-chain therefor, the shaft O and sprocket P for carrying the chain, the sprocket Q outside the elevator on the said shaft O, in combination with the shaft T of the corn-sheller, the sprocket S thereon, the chain R for both sprockets, the ratchet-bar 3 adapted to engage the shaft of the sheller, said bar having the teeth 2, and the plates U and V secured to the sides of the elevator and with which the teeth of the said bar are adapted to engage for the purposes set forth and described.

8. In an elevator and conveyer mechanism of the character set forth, the combination of the conveyer-body, the conveyer-shaft, slidable bearings therefor, there being openings in the sides of the conveyer for the reception of the bearings, a shaft at the end of the conveyer, cables attached to the two shafts substantially as described, said cables adapted to be wound on one of them to shift the other together with its slidable bearings and means for holding the winding-shaft stationary after adjustment all for the purposes explained.

9. In a combined elevator and conveyer of the character described, the shafts O and 9 located substantially as set forth, the drag-chain for running over them, the movable bearing-blocks 8 for carrying said shaft 9, the shaft 14, the cables 12 attached thereto, such cables being also attached to the shaft 9 substantially as described, and the ratchet-wheels 15 on the shaft 14 together with the pawls 16 for holding said ratchets and shaft 14 wherever placed for the purposes indicated.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN MABUS.
FRANK L. HAY.

Witnesses:
JOSEPH STOREY,
CLAUDE CASEY.