

No. 835,526.

PATENTED NOV. 13, 1906.

H. HORN.

APPARATUS FOR CONVEYING MATERIALS.

APPLICATION FILED JULY 25, 1905.

2 SHEETS—SHEET 1.

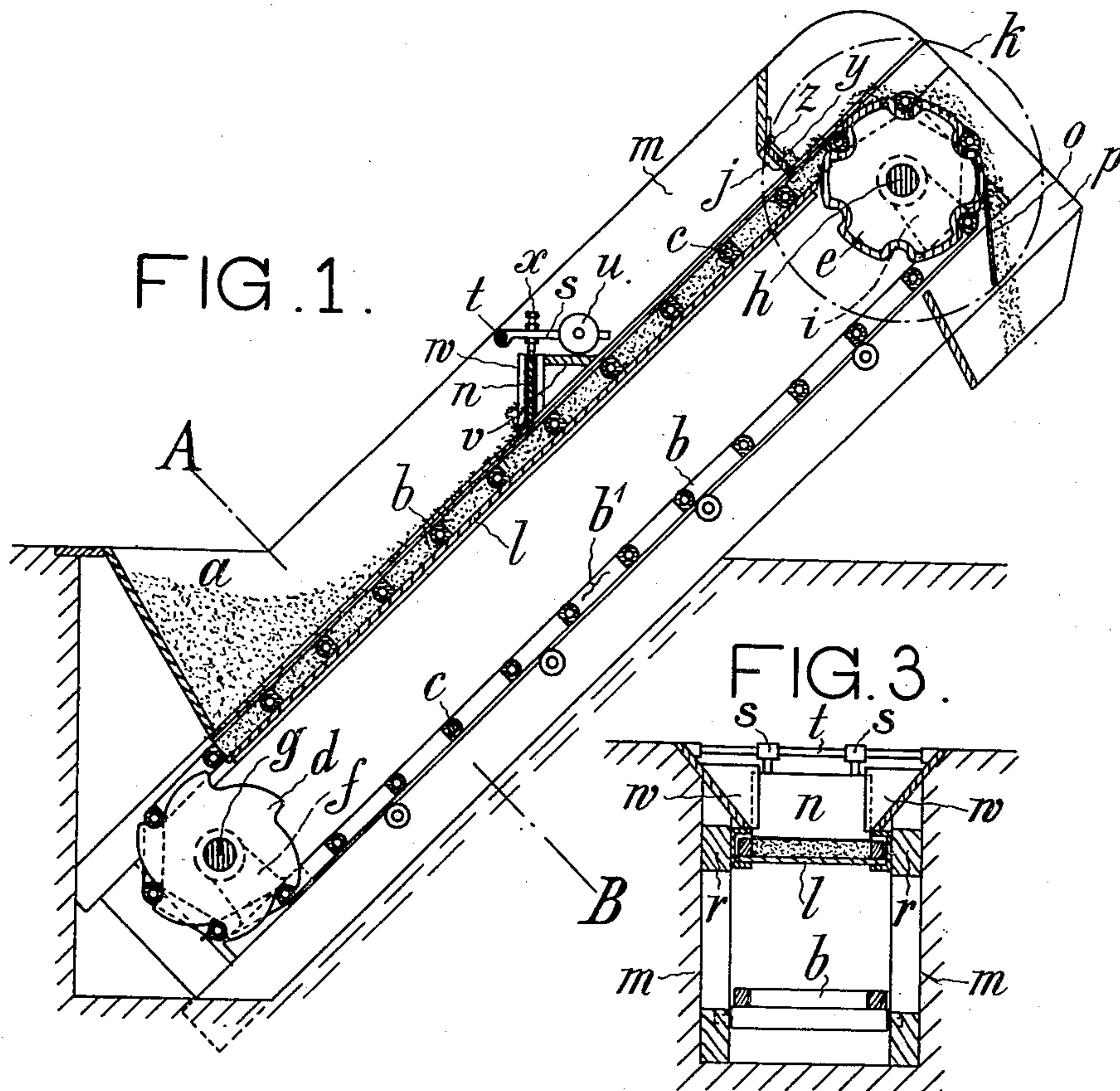


FIG. 1.

FIG. 3.

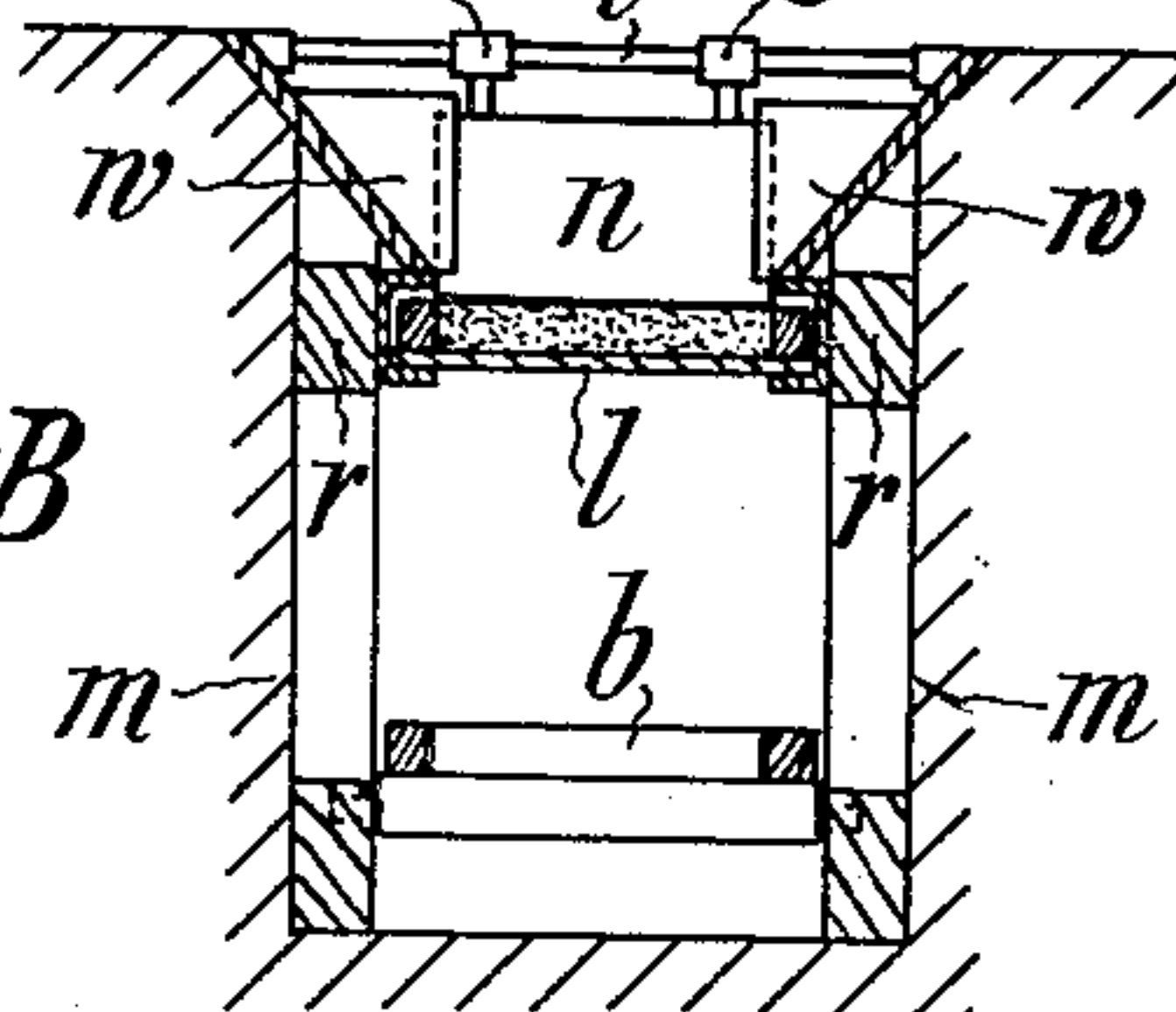
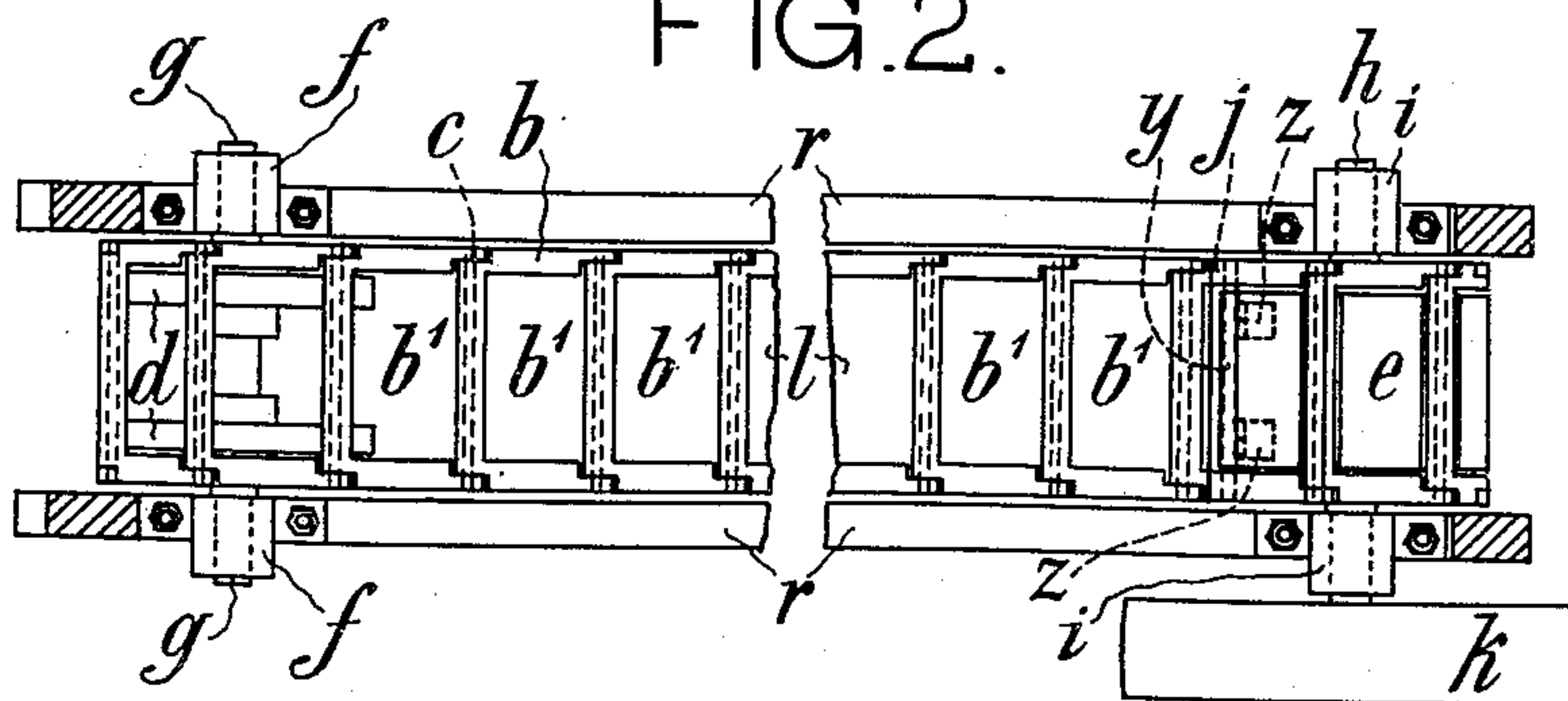


FIG. 2.



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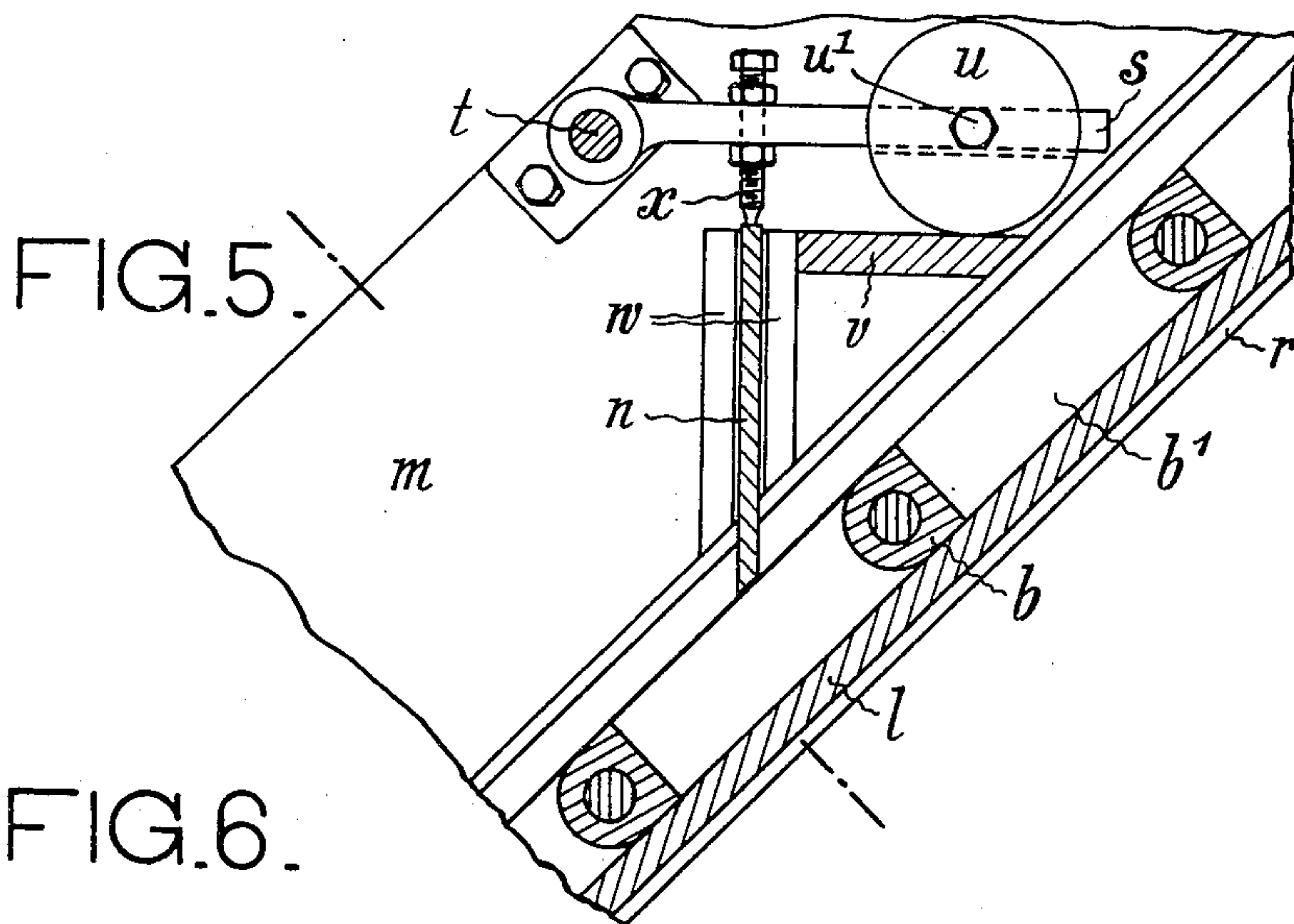
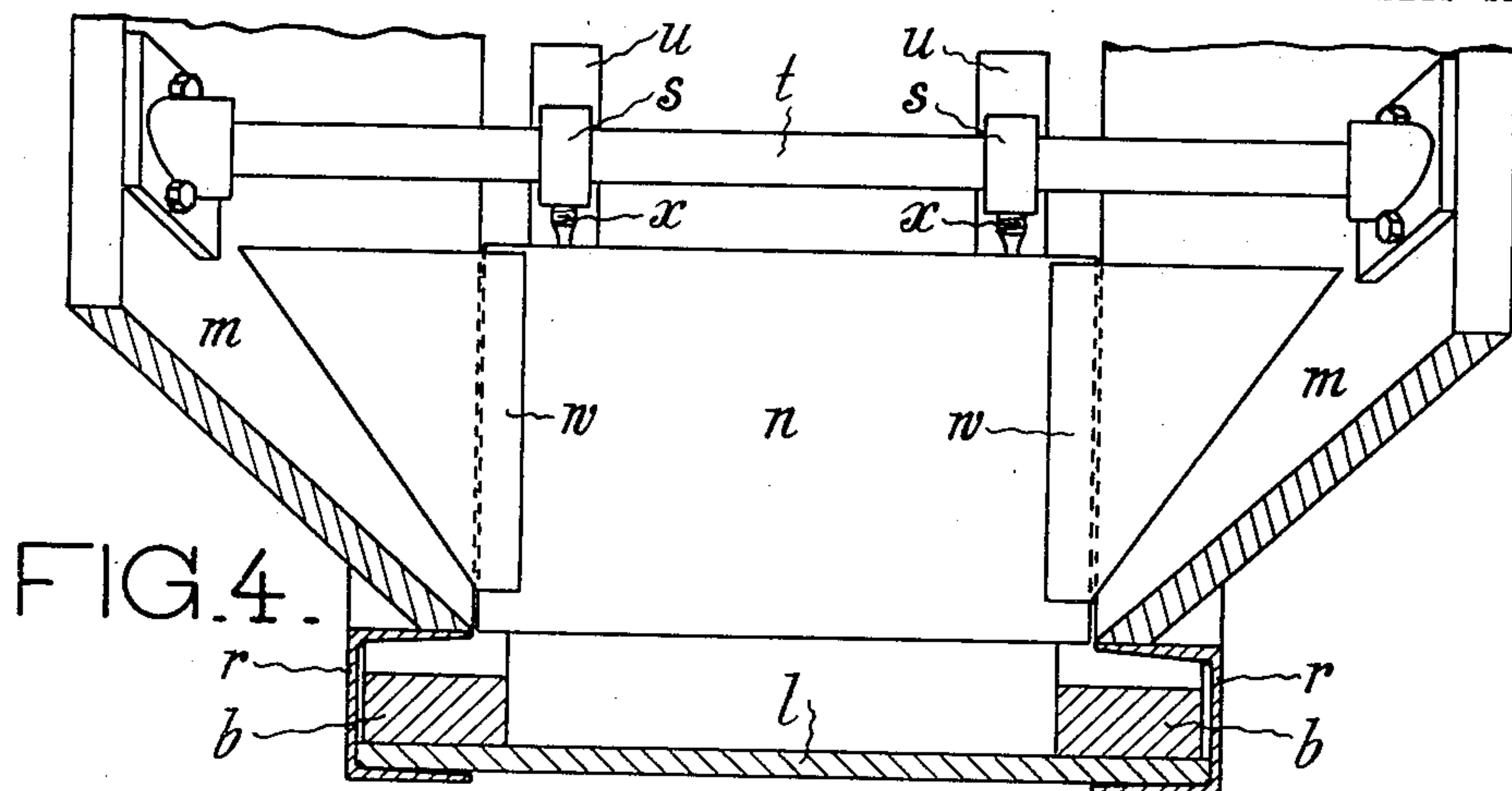
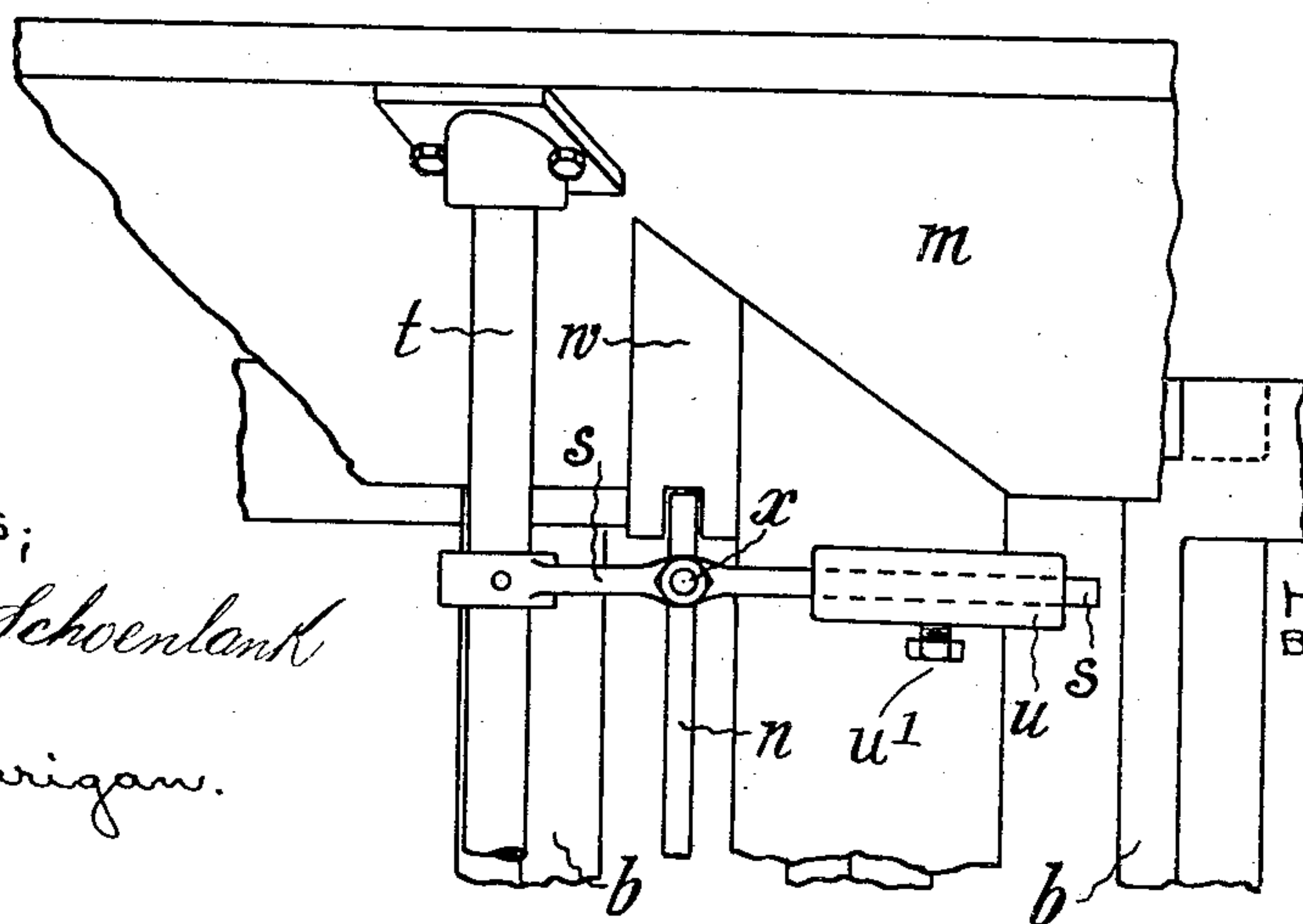


FIG. 6.



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UNITED STATES PATENT OFFICE.

HEINRICH HORN, OF GÖRLITZ, GERMANY.

APPARATUS FOR CONVEYING MATERIALS.

No. 835,526.

Specification of Letters Patent.

Patented Nov. 13, 1906.

Application filed July 25, 1905. Serial No. 271,130.

To all whom it may concern:

Be it known that I, HEINRICH HORN, a subject of the King of Prussia, German Emperor, residing at 12 Biesnitzerstrasse, Görlitz, in the Kingdom of Prussia and Empire of Germany, have invented new and useful Improvements in Apparatus for Conveying Materials, of which the following is a specification.

My invention relates to apparatus for conveying tenacious or sticky material—such as moist clay, loam, and the like—by means of a drag-chain, which takes the material automatically from a feed-receptacle and mixing it in a long channel adjoining the said receptacle conducts the same in equal quantities to machines. The material, which is uniformly distributed by means of a leveling means, herein called “striking-off board” or “scraping-board” or “scraper,” in the spaces between the links of the drag-chain is forced from this chain by one of the chain-drums, the periphery of such drum being provided with elevations corresponding in size to the spaces between the chain-links and engaging these spaces in the passage of the drag-chain. Any material which may adhere to the elevations can if necessary be removed by a scraper. In order to prevent the material which has been forced from the drag-chain by the elevations on the periphery of the chain-drum from falling back upon the drag-chain and into the conveyer-channel, I provide a catching device as near as practicable to the chain-drum. The aforesaid scraping or striking device may at the same time serve for this purpose, thereby enabling the conveyer-channel, which joins the receptacle into which the material is thrown, to be utilized completely for mixing the material.

In the accompanying drawings I have shown a constructional form of this invention by way of example.

Figure 1 is a vertical longitudinal section. Fig. 2 is a plan. Fig. 3 is a transverse section on the line A B of the apparatus. Fig. 4 is an enlarged view of a portion of Fig. 3. Fig. 5 is an enlarged view of a portion of Fig. 1, and Fig. 6 is a fragmentary plan view showing the striking-off board or scraper and weight means.

The endless drag-chain *b* consists of links cast in one piece and connected with each other by bolts *c*, fixed therein by riveting. This chain is conducted over two chain-drums *d* and *e*. The lower chain-drum *d* is

keyed upon a shaft *g*, held in two bearings *f*, while the upper chain-drum *e* is fixed upon the shaft *h*, which is held in the two bearings *i* and adapted to be set in rotation by the belt-pulley *k*. Whereas the lower chain-drum *d* consists, as usual, of two toothed disks serving to guide the drag-chain *b*, the upper chain-drum *e* forms a cylinder having recesses for the transverse bars of the links of the chain *b*. This drag-chain passes over the cylindrical drum *e* and its upward bars engage the recesses in the drum. The upwardly-moving part of the drag-chain *b* slides in the well-known manner upon the plate or bottom *l*, which, together with the walls *m*, strengthened by beams *r*, forms between the two chain-drums *d* and *e* the feed-receptacle *a* and the conveyer-channel joining such receptacle.

The links of the chain *b*, sliding upon the plate or bottom *l*, form rectangular spaces *b'*, which are filled up with the material that lies in the feed-receptacle *a* or is thrown into the same or into the adjoining conveyer-channel. On its way to the top the material taken away by the drag-chain often rolls back and is turned over in order to be again conducted higher up and to partially fall back once more, so that it will become thoroughly mixed in the long channel.

Approximately in the middle of the length of the conveyer-channel I arrange the scraping or leveling device designed to remove the excess of material from the drag-chain. This device has a striking-off or leveling board *n*, adapted to bear by its lower edge upon the drag-chain, this board being fitted to move up and down in vertical guides *w* (see especially Figs. 4, 5, and 6) on the side walls *m* of the conveyer-channel and subjected to the action of weighted levers *s*. The latter can turn upon a bolt *t*, fixed in the side walls *m* of the conveyer-channel and are furnished with adjustable weights *u*, slidable on the levers or arms *s* and clamped in the desired position by screws *u'*. Their downward movement is limited by these weights *u* bearing in their lowest position upon a stop *v* in the form of a transverse bar. Moreover, the action of the weighted levers *s* upon the scraping or striking board *n* can be regulated, the former transmitting their pressure to the scraping or striking board *n* through the intervention of screws *x*, adjustably carried by the levers or arms *s* and which bear upon the upper edge of the movable scraping or striking-off board

n. Said board *n* retains the material *s*, lying in heaps between the links of the drag-chain *b*, and spreads it out. As a consequence, the spaces *b'* between the links of the chains are
 5 always quite filled up, and the links do not carry away more material than can find room between them. In case there are large stones between the links the scraping or striking-off board *n* will be lifted against the
 10 counterweights *u* and will immediately be lowered again after the passage of the stone.

By its cylindrical faces, which form elevations, the upper chain-drum *e* forces the material lying in the spaces *b'* between the
 15 links of the drag-chain from between these links and throws it off. Part of the material thus ejected will fall back into the conveyer-channel. In order to catch up the material which may fall back, I provide a catching de-
 20 vice in front of the point where the drag-chain runs onto the upper chain-drum *e*. The said catching device comprises a flap *y*, adapted to move about hinges *z* in the direction of motion of the drag-chain and pre-
 25 vented by stops *j* to move in the other direction. Thus the flap can yield to large stones, so as to let them pass, and prevents the material from falling back into the channel. It will be seen, therefore, that the material will
 30 be uniformly carried away by the drag-chain *b* and that the quantity will depend upon the free spaces *b'* between the links and that the speed of delivery will be proportionate to the speed of movement of the chain *b*.

35 For particularly tenacious or adhesive material I have arranged between the lateral beams *p* a scraper *o*, which extends to the cylindrical faces of the drum *e* and scrapes any adhering material off the drum *e*.

40 In case the scraping or leveling device, with the movable scraping-board *n*, is arranged immediately in front of the point where the drag-chain runs onto the upper drum *e* the material forced out by the latter
 45 will be prevented from falling back into the conveyer-channel, thus enabling a special catching device to be dispensed with.

What I claim as my invention, and desire to secure by Letters Patent, is—

50 1. In apparatus of the character described, a drag-chain, a lower and an upper chain-drum, over which the drag-chain runs, a bottom for the drag-chain between the chain-
 drums, side walls on the bottom which form
 55 with the latter a feed-receptacle and the conveyer-channel adjoining this receptacle, cylindrical elevations on the upper chain-drum, between which the bars of the drag-chain enter, a movable scraping-board, vertical
 60 guides for the same on the side walls of the bottom, means for weighting the movable scraping-board, and means for regulating the weight, substantially as and for the purpose herein set forth.

65 2. In apparatus of the character described,

a drag-chain, a lower and an upper chain-drum, over which the drag-chain runs, a bottom for the drag-chain between the chain-
 drums, side walls on the bottom which form
 70 with the latter a feed-receptacle and the conveyer-channel adjoining this receptacle, cylindrical elevations on the upper chain-drum, between which the bars of the drag-chain enter, a movable scraping-board, vertical
 75 guides for the same on the side walls of the bottom, weighted levers for weighting the movable scraping-board, weights adapted to be adjusted thereon, screws which are adjustable therein for transmitting the pres-
 80 sure to the scraping-board, and a fixed stop for the weighted levers to bear thereon in their lowest position, substantially as and for the purpose herein set forth.

3. In apparatus of the character described, a drag-chain, a lower and an upper chain-
 85 drum, over which the drag-chain runs, a bottom for the drag-chain between the chain-
 drums, side walls on the bottom which form
 90 with the latter a feed-receptacle and the conveyer-channel adjoining this receptacle, cylindrical elevations on the upper chain-drum, between which the bars of the drag-chain enter, a movable scraping-board, vertical
 95 guides for the same on the side walls of the bottom, means for weighting the movable scraping-board, means for regulating this weight, and a catching device for preventing the material ejected from falling back into the channel, substantially as and for the purpose herein set forth.

4. In apparatus of the character described, a drag-chain, a lower and an upper chain-
 drum, over which the drag-chain runs, a bottom for the drag-chain between the chain-
 drums, side walls on the bottom which form
 105 with the latter a feed-receptacle and the conveyer-channel adjoining this receptacle, cylindrical elevations on the upper chain-drum, between which the bars of the drag-chain enter, a movable scraping-board, vertical
 110 guides for the same on the side walls of the bottom, means for weighting the movable scraping-board, means for regulating this weight, a flap arranged in front of the point
 115 where the drag-chain runs onto the upper chain-drum, and adapted to move in the direction of motion of the drag-chain, and fixed stops for preventing the flap to move in the opposite direction, substantially as and for the purpose herein set forth.

5. In apparatus of the character described, a drag-chain, a lower and an upper chain-
 drum, over which the drag-chain runs, a bottom for the drag-chain between the chain-
 drums, side walls on the bottom which form
 125 with the latter a feed-receptacle and the conveyer-channel adjoining this receptacle, cylindrical elevations on the upper chain-drum, between which the bars of the drag-chain enter, a movable scraping-board which is ar- 130

ranged immediately in front of the point where the drag-chain runs onto the upper chain-drum, vertical guides for the same on the side walls of the bottom, means for weighting the movable scraping-board, and means for regulating this weight, substantially as and for the purpose herein set forth.

6. In apparatus of the character described, a drag-chain, a lower and an upper chain-drum, over which the drag-chain runs, a bottom for the drag-chain between the chain-drums, side walls on the bottom which form with the latter a feed-receptacle and the conveyer-channel adjoining this receptacle, cylindrical elevations on the upper chain-drum, between which the bars of the drag-chain enter, a scraper bearing against the cylindrical elevations of the upper chain-drum, a movable scraping-board, vertical guides for the same on the side walls of the bottom, means for weighting the movable scraping-board, and means for regulating the weight, substantially as and for the purpose herein set forth.

7. In apparatus of the character described, a drag-chain, chain-drums over which the

drag-chain runs, a bottom for the drag-chain between the chain-drums, side walls on the bottom which form with the latter a feed-receptacle, a conveyer-channel adjoining this receptacle, elevations on one chain-drum, between which the bars of the drag-chain enter, and a movable scraping-board, substantially as described.

8. In apparatus of the character described, a receptacle, an open drag-chain passing through the receptacle, and means for closing the openings in the chain, in combination with means for traversing the chain and with a catching device, and with means situated beyond the scraper for removing conveyed material from the chain, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HEINRICH HORN

Witnesses:

HERBERT SMITH,
ALMA SÜNDER.