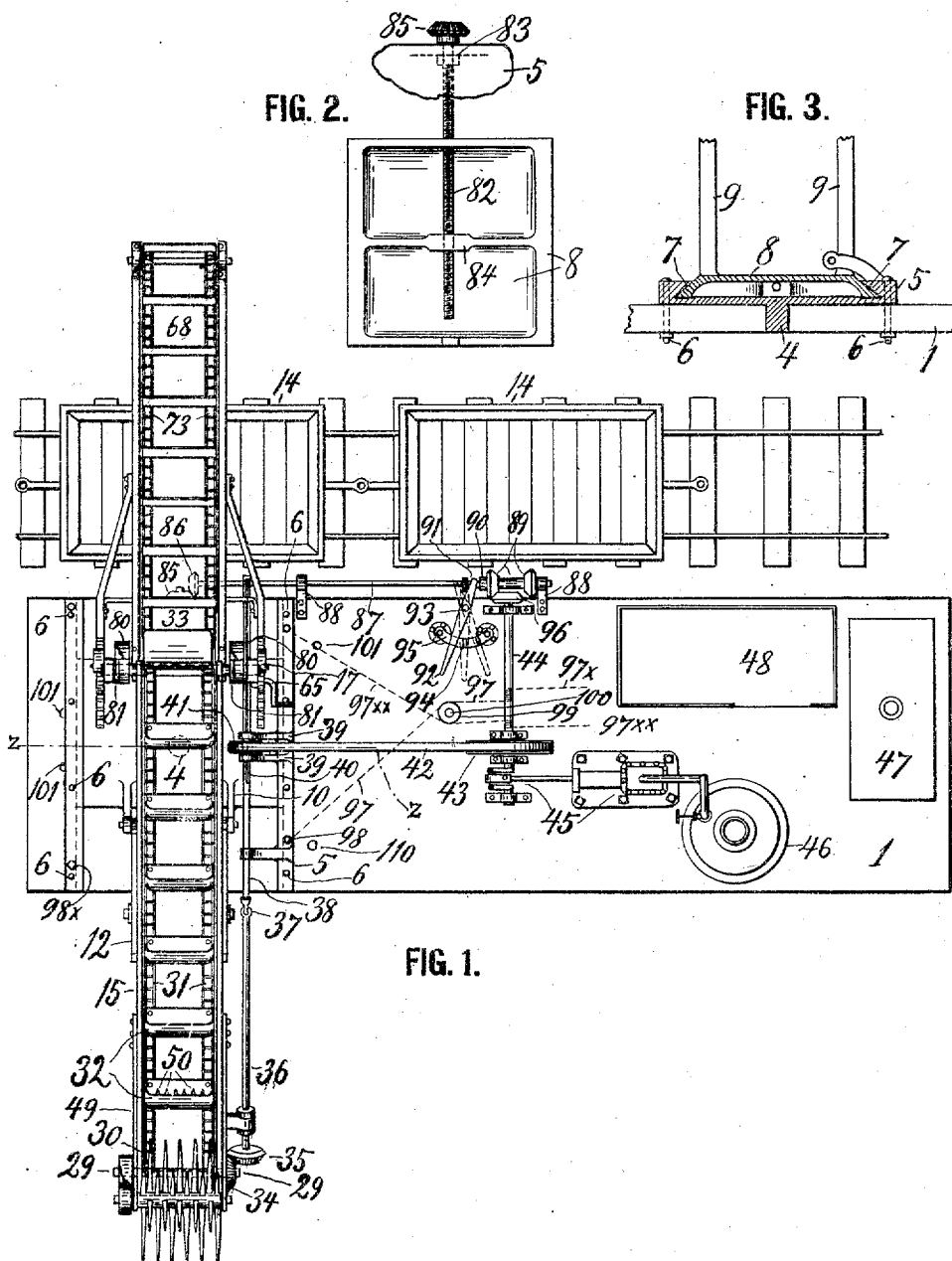


T. REISTAD.
EXCAVATING MACHINE.
APPLICATION FILED APR. 29, 1907.

2 SHEETS—SHEET 1.



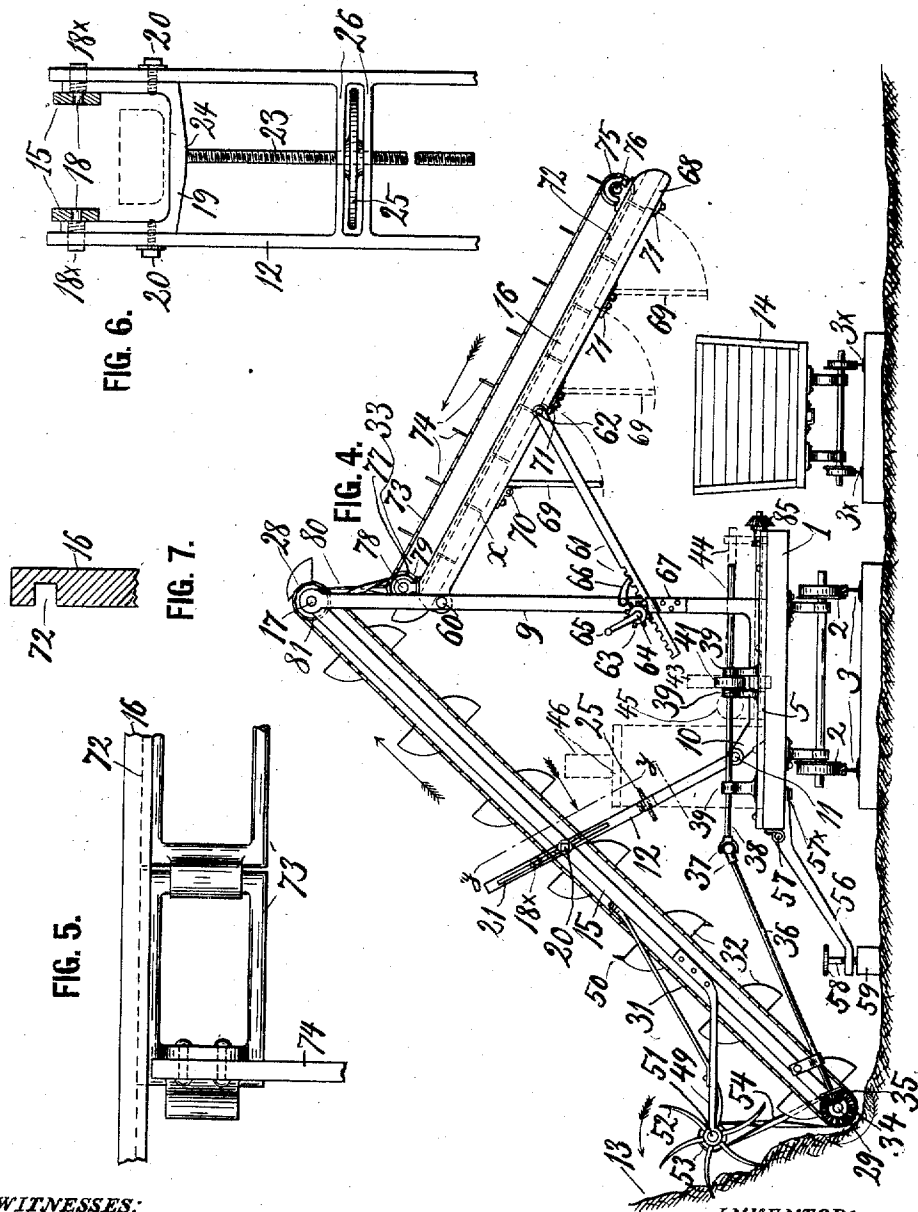
WITNESSES:

D. E. Carlson.
L. E. Carlson.

INVENTOR:
Torgels Reistad.
BY HIS ATTORNEY:
A. M. Carlsen.

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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

TORGELS REISTAD, OF ST. PAUL, MINNESOTA.

EXCAVATING-MACHINE.

No. 880,826.

Specification of Letters Patent.

Patented March 3, 1908.

Application filed April 29, 1907. Serial No. 370,811.

To all whom it may concern:

Be it known that I, TORGELS REISTAD, a subject of the King of Norway, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented a new and useful Excavating-Machine, of which the following is a specification.

My invention relates to excavating machines, and the object is to provide a comparatively cheap but efficient machine for excavating in general, but more specially for removing hills and grading roads and loading the earth upon adjacent wagons or cars by which it is hauled away. This and other objects I attain by the novel construction and arrangement of parts illustrated in the accompanying drawing, in which,—

Figure 1 is a top or plan view of my excavating machine and some sand cars upon a track in position to be filled. Fig. 2 is a bottom view of a bed or frame sliding upon the main frame and supporting the working mechanism, and a fragment of the main frame. Fig. 3 is a vertical cross section on line *z z* in Fig. 1, of the sliding frame and the fixed frame in which it moves. Fig. 4 is a side elevation of the machine and end elevation of its platform and of the cars to be filled, looking from right to left in Fig. 1, but with engine and boiler only in dotted outlines and water and coal box omitted. Fig. 5 is a detail top view near *x* in Fig. 4. Fig. 6 is an enlarged sectional view on the line *yy* in Fig. 4. Fig. 7 is a cross section or end view of the upper bar in Fig. 5.

Referring to the drawing by reference numerals, 1 designates the base or body of the machine, and it consists of a heavy platform supported on wheels 2, adapted to stand on rails 3 and to travel on ordinary railway rails during transportation. Upon said platform is pivoted at 4 to turn in horizontal plane a bed-plate 5, held in normal position as in Fig. 1 by bolts 6, (see Fig. 3). In said bed-plates slides at 7 a frame plate 8 having two uprights 9, and two lugs 10, to which is pivoted at 11 a bracing frame 12 (best shown in Fig. 6).

In Fig. 4, 13 presents a hill side from which the machine is taking earth and loading it into the car 14 on track 3^x. This is accomplished by two conveyers, 15 and 16. The conveyer 15 is composed of a frame 15, pivoted at 17 and supported by the bracing frame 12, in which it is held by trunnion-

screws 18, screwed into a U-shaped piece 19, held in the frame 12 by bolts 20, which may slide up and down in slots 21 in the frame; in said slots engage also the flattened ends 18^x of the trunnion screws, so as to keep them from accidental turning. 23 is a screw fixed at 24 and moved end-wise up and down by the hand-wheel 25, retained between cross bars 26 of the frame and having screw-threads engaging the screw so that by turning the wheel the conveyer will be raised and lowered to various positions, in which it is held more firmly by tightening the screws or bolts 20. In said conveyer 15 is journaled the upper shaft 17 with wheels 28 fixed on it, and the lower shaft 29 with chain-wheels 30, which engage and drive two endless chains 31, on which are secured a series of steel buckets 32, which may have teeth 50 and are adapted to dig and convey the earth and deposit it at 33 upon the conveyer 16, which conveys it to the car, as will presently be more fully described.

The shaft 29 is rotated by having a bevel gear 34 engaged by a bevel gear 35, fixed on a shaft 36, which is connected by a universal joint 37 to a shaft 38, sliding in bearings 39 fixed on the bed plate 5 and having a key-way 40 engaged by a slidable key fixed in a pulley 41, which is guided between two of the bearings 39 and driven by a belt 42 from a pulley 43 fixed on the shaft 44 of the engine 45 mounted on the platform and having a boiler 46, water tank 47 and coal box 48.

In frame arms 49 extending from frame 15, is journaled the shaft 51 of a digging wheel 52, whose curved sharp arms loosen and bring down the earth so that the buckets 32 need not do much digging in order to get full as they pass the lower end of frame 15. Said shaft 51 is turned by a pulley 53, fixed on it and a crossed belt 54 and a pulley 55 fixed on one end of shaft 29. Shields (not shown) are used to keep said pulleys and belt and the gears 34—35 from getting damaged by the sand and earth.

56 is one of several supporting arms which are foldable upward on joints 57 during transportation of the machine, but when the machine is in use they are each held by a bolt 57^x, and each of them carries a screw 58, which makes the arm adjustable to a supporting block 59 placed on the ground.

The second conveyer has its frame 16 pivoted at 60 to the uprights 9 and supported

by two rack-bars 61, pivoted at 62 and operated by pinions 63, fixed on a shaft 64 journaled to the posts 9 and turned by a crank 65.

66 is a dog engaging one of the tracks to hold it in the desired position.

67 is a guide fixed on the post to guide the rack. One or two racks may be used, and the dog may engage either the rack or the pinion.

The frame 16 is provided with a bottom 68 in which are several large openings, each of which is normally closed by a shutter 69 hinged at 70 and held closed by latches 71, flush with the upper side of the bottom, so that in operation of the machine, the frame being inclined acts as a chute capable of conveying earth or sand to the cars 14, either through its outer end or through the opening after such of the shutters as may be folded down, according to the distance the car is away from the machine, such distance being varied by moving of the machine toward the hill several times before the long track the cars move on needs to be moved.

To insure motion of the earth in the chute without inclining the chute by an undesirable high framework, I provide the sides of it with grooves 72, (see Figs. 5 and 7), in which are guided the edges of endless link-belts 73, provided with transversely-disposed fixed wings 74, which move the earth along the bottom of the chute. The conveyer belt thus formed is stretched over rollers or wheels 75 on shaft 76 and sprockets 77 fixed on shaft 78; the latter has fixed pulleys 79 driven by crossed belts 80 and pulleys 81 fixed on shaft 17.

As best shown in Figs. 2 and 3, a feed screw 82 is journaled at 83 to the bed-plate 5 and screw-threaded in a bearing 84 of the sliding frame 8. The outer end of the screw is provided with a bevel gear 85, driven by a bevel gear 86, (see Fig. 1), fixed on a shaft 87, journaled in bearing 88. And upon said shaft is keyed to slide a double-faced friction drum or member 89 having in its end-hub 90 an annular groove 91, engaged by a shifter-lever 92, pivoted at 93 and normally engaging a notch 94 in a fixed segment 95, so that the friction member stands clear of the friction member 96 fixed on the engine shaft 44; but whenever the lever is held toward one end of the segment 95 one of the friction faces 89 will be engaged by the member 96 and thus the screw 82 will move the frame plate 8 and all machinery supported on it, to and from the hill under excavation. This motion is mainly used to enable the machine to dig away a belt of earth of considerable width along its track before the track needs to be moved; and, as already stated, the shutters 69 compensate not only for said motion by the screw 82 but also for one or two movings of the track 3 toward the hill. The lever 92 may also be used very con-

veniently to increase the pressure of the digging devices proper against the ground when so required, and to withdraw the diggers when the ground in front of them slides down faster than the machine can remove it.

When the machine is to be transported on railways, the conveyers are turned in longitudinal direction of the platform 4 and the rails of the road. This is done by removing the bolts 6 and attaching a cable or rope 97 to a horn 98 on the bed plate, the rope is then taken over a pulley 99, turning on a post 100 fixed on the platform, and then taken a few turns around the shaft 44 of the engine, and as the latter is started up while a person gathers in the rope at 97^x, the plate 5, which may also be called a turn-table, turns on the stem 4 to some extent, and then the rope is placed on the horn 98^x and the engine applied again until the conveyer frames occupy a longitudinal central position of the platform, so as to pass through tunnels and wherever else an ordinary train can move; the turn table is then temporarily secured to the platform by inserting some of the bolts 6 through their regular holes in the table and holes 101 in the platform. And when the turn-table is to be returned to its normal position the rope is put in the position 97^{xx}, so it turns the table in the opposite direction. During the turning of the table the shaft 87, its bearings 88, engine belt 42 and shaft 36 are detached and placed upon the platform.

Having thus described my invention, what I claim is:—

1. An excavating machine comprising in combination, a body or platform having wheels adapted to stand and move on rails, a turn-table mounted thereon, and means for securing it in different positions, a frame guided to slide horizontally on the turn-table and having uprights, an endless inclined elevator supported by said uprights and having buckets adapted to dig and convey earth up the incline, a conveyer or chute receiving the earth from the elevator and delivering it into cars at the opposite side of the machine, an engine carried by the machine, and means operated by the engine for driving said elevator and conveyer and for feeding the sliding frame back and forth.

2. An excavating machine comprising in combination, a body or platform having wheels adapted to stand and move on rails, a turn-table mounted thereon, and means for securing it in different positions, a frame guided to slide horizontally on the turn-table and having uprights, an endless inclined elevator supported by said uprights and having buckets adapted to dig and convey earth up the incline, a conveyer or chute receiving the earth from the elevator and delivering it into cars at the opposite side of the machine, an engine carried by the machine, and means operated by the engine for driving said elevator

and conveyer and for feeding the sliding frame back and forth, said conveyer comprising a chute with several shutters in the bottom, for the purpose set forth.

5 3. An excavating machine comprising in combination, a body or platform having wheels adapted to stand and move on rails, a turn-table mounted thereon, and means for securing it in different positions, a frame
10 guided to slide horizontally on the turn-table and having uprights, an endless inclined elevator supported by said uprights and having buckets adapted to dig and convey earth up
15 the incline, a conveyer or chute receiving the earth from the elevator and delivering it into cars at the opposite side of the machine, an
20 engine carried by the machine, and means operated by the engine for driving said elevator and conveyer and for feeding the sliding frame back and forth, said conveyer comprising a chute with several shutters in the
25 bottom, and an endless guided conveyer belt or belts with blades adapted to move the earth along in the chute to the end of it, or to such shutter as may be open.

4. An excavating machine comprising in combination, a body or platform having wheels adapted to stand and move on rails, a turn-table mounted thereon, and means for
30 securing it in different positions, a frame guided to slide horizontally on the turn-table and having uprights, an endless inclined elevator supported by said uprights and having
35 buckets adapted to dig and convey earth up the incline, a conveyer or chute receiving the earth from the elevator and delivering it into cars at the opposite side of the machine, an
40 engine carried by the machine, and means operated by the engine for driving said elevator and conveyer and for feeding the sliding frame back and forth, and means carried by the sliding frame for changing the incline of the elevator and of the chute.

5. An excavating machine comprising in combination, a body or platform having wheels adapted to stand and move on rails, a turn-table mounted thereon, and means for
45 securing it in different positions, a frame guided to slide horizontally on the turn-table

and having uprights, an endless inclined elevator supported by said uprights and having
50 buckets adapted to dig and convey earth up the incline, a conveyer or chute receiving the earth from the elevator and delivering it into cars at the opposite side of the machine, an
55 engine carried by the machine, and means operated by the engine for driving said elevator and conveyer and for feeding the sliding frame back and forth, journal bearings on the turn-table, a shaft sliding therein and
60 having a universal joint whereby a portion of it may be inclined, gear-wheels connecting said inclined portion with one of the shafts of the endless elevator, a pulley slidably keyed on the shaft, and a belt thereon receiving motion from the engine, and means for retaining the pulley in line with the belt when the shaft slides.
65

6. An excavating machine comprising in combination, a body or platform having
70 wheels adapted to stand and move on rails, a turn-table mounted thereon, and means for securing it in different positions, a frame guided to slide horizontally on the turn-table and having uprights, an endless inclined elevator supported by said uprights and having
75 buckets adapted to dig and convey earth up the incline, a conveyer or chute receiving the earth from the elevator and delivering it into cars at the opposite side of the machine, an
80 engine carried by the machine, and means operated by the engine for driving said elevator and conveyer and for feeding the sliding frame back and forth, said feeding mechanism comprising a screw journaled in the
85 turn-table and engaging the sliding frame to move it, operative connection between said screw and the engine, and a friction clutch mechanism interposed in the operative connection, and a lever by which the operator
90 controls the friction mechanism.

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

TORGELS REISTAD.

Witnesses:

A. M. CARLSEN,
D. E. CARLSEN.