C. B. DUNN.

GRADING MACHINE.

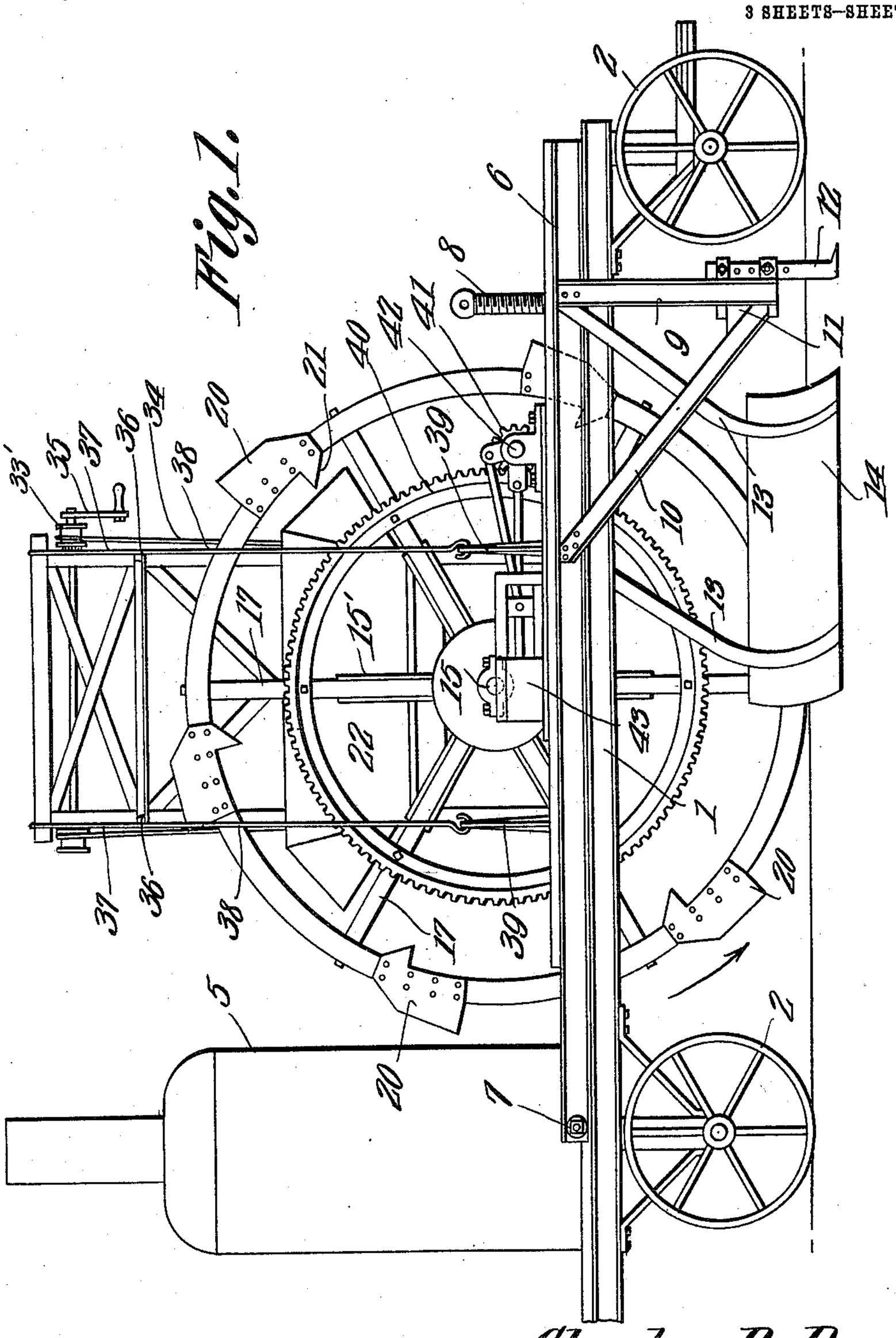
APPLICATION FILED JAN. 25, 1911.

998,680.

Patented July 25, 1911.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses

J. Stoutenburgh

L. H. Wilson.

Charles B. Dunn

Inventor,

by Cachow & Co.

Attorneys.

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

C. B. DUNN.

GRADING MACHINE.

APPLICATION FILED JAN. 25, 1911.

998,680.

Patented July 25, 1911.

3 SHEETS—SHEET 2.

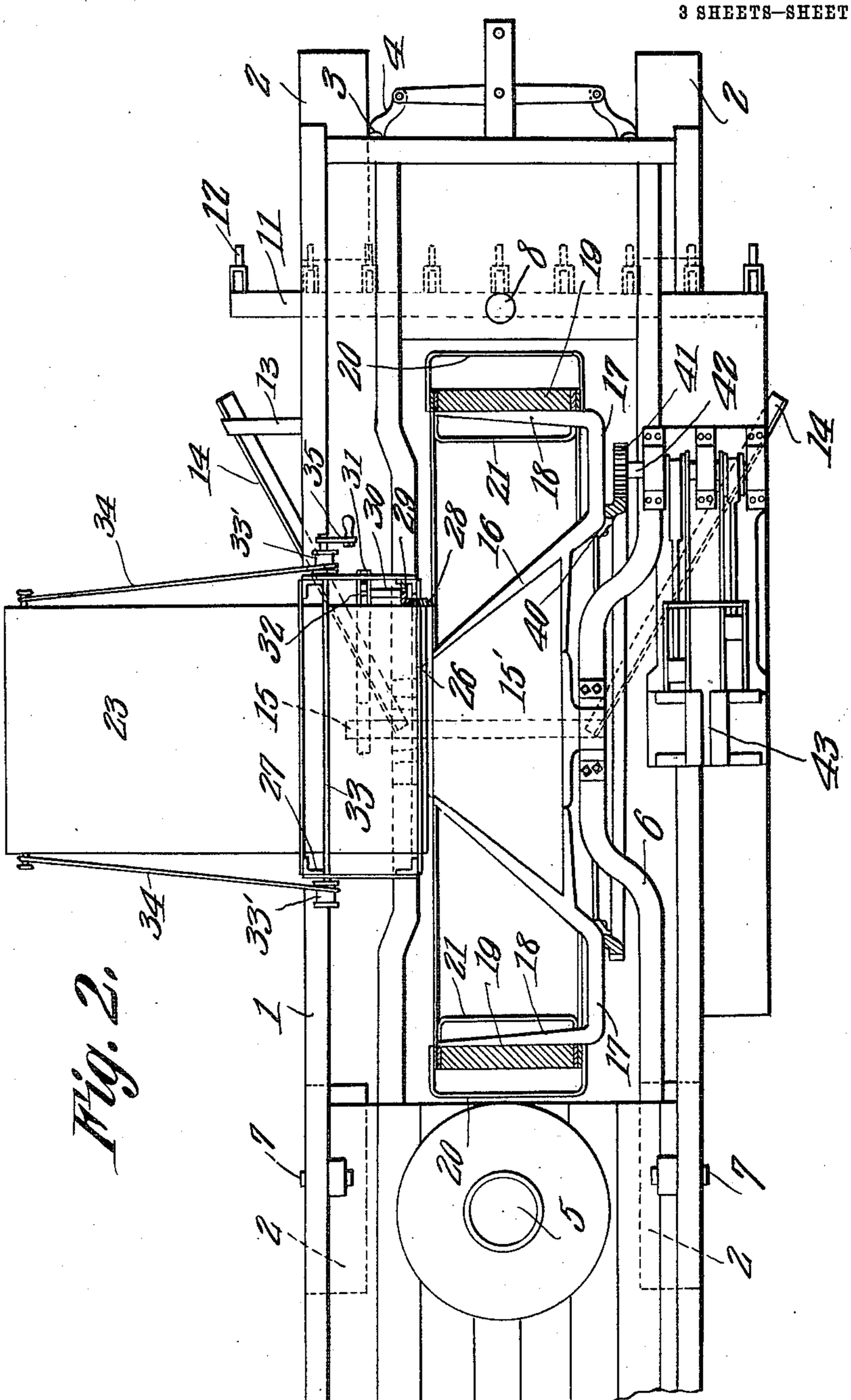


Fig. 2.

Witnesses

J. Stoneis

L. H. Wilson.

Charles B. Dunn
Inventor,

by Cashow & Co.
Attorneys.

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

C. B. DUNN.

GRADING MACHINE.

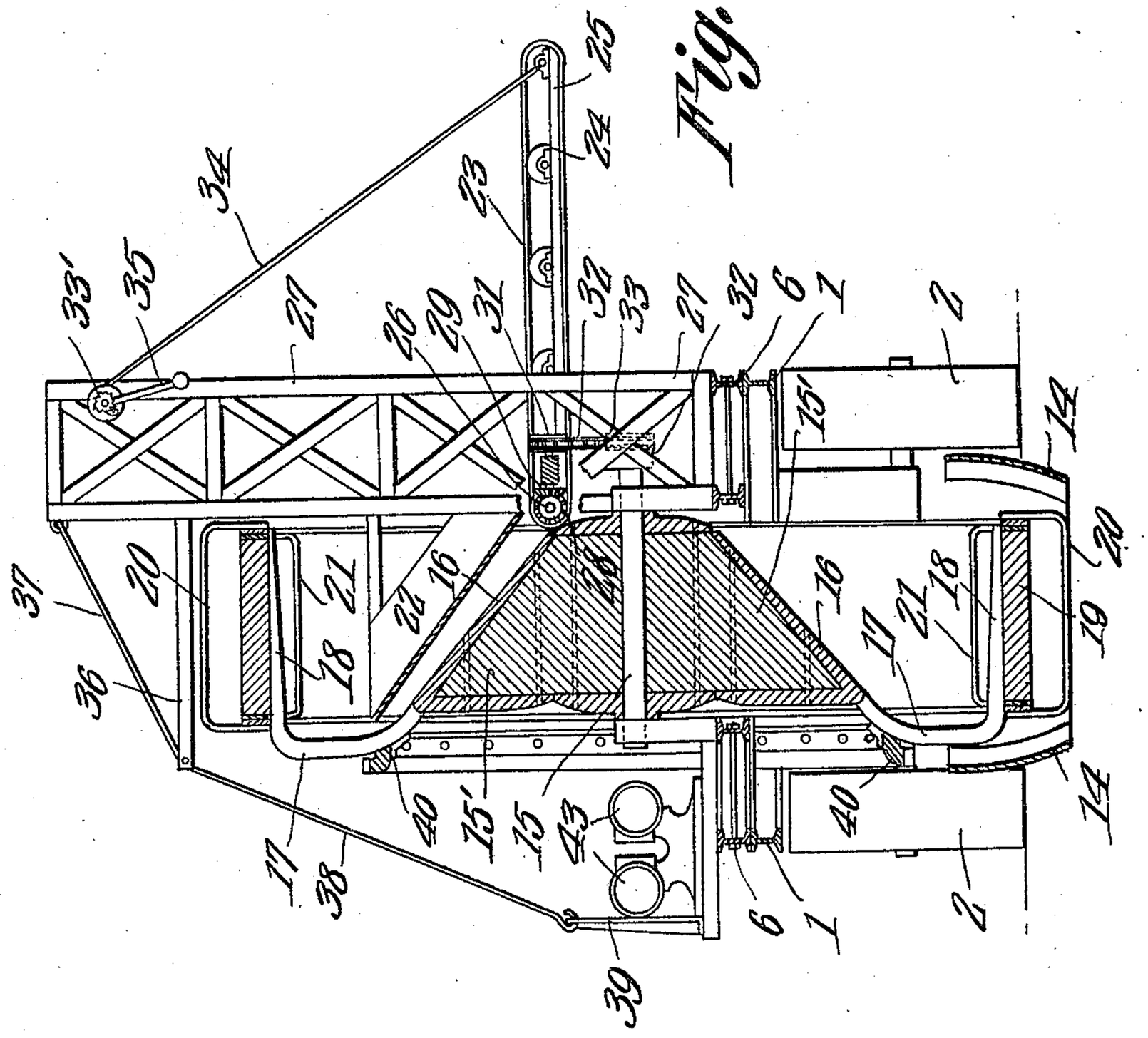
APPLICATION FILED JAN. 25, 1911.

998,680.

Patented July 25, 1911.

3 SHEETS—SHEET 3.

Fig. 3.



Witnesses

J. Stoner

L. H. Wilson.

Charles B. Dunn
Inventor,

by Cachow & Co.
Attorneys.

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CHARLES BUSHNELL DUNN, OF BIRMINGHAM, ALABAMA.

GRADING-MACHINE.

998,680. Specification of Letters Patent. Patented July 25, 1911.

Application filed January 25, 1911. Serial No. 604,694.

To all whom it may concern:

Be it known that I, CHARLES B. DUNN, a citizen of the United States, residing at Birmingham, in the county of Jefferson and State of Alabama, have invented a new and useful Grading-Machine, of which the following is a specification.

This invention relates to grading machines, its principal object being the provision of means whereby a cut equal to or greater than the width of the machine can be made during each trip of the machine.

A further object is to provide improved means for adjustably mounting the excavating and conveying elements relative to the supporting structure, whereby cuts of different depths may be made.

Another object is to provide a compact form of excavating wheel carrying a plurality of buckets, these buckets being designed to successively discharge into a hopper extending into the wheel and which serves to direct the discharged material onto an adjustably supported conveyer extending laterally from the machine.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

In the accompanying drawings the preferred form of the invention has been shown.

In said drawings:—Figure 1 is a side elevation of the complete machine. Fig. 2 is a horizontal section through the excavating wheel and showing the body of the machine and the motor and conveyer in plan. Fig. 3 is a central vertical section taken transversely through the machine.

Referring to the figures by characters of reference 1 designates the main frame of the machine, the same being made up of any desired arrangement of I or channel beams and being carried by supporting wheels 2, the front wheels having knuckles 3 and arms 4 whereby said wheels can be shifted by means of any suitable mechanism for the purpose of steering the machine while being drawn from place to place. A boiler, such as indicated at 5, is preferably mounted upon the rear end of the main frame 1.

A supplemental frame 6 made up of any suitable arrangement of I beams, channel beams or the like, is mounted on the main frame 1 and is pivotally connected thereto, at one end, as indicated at 7. This supplemental frame may be shifted at its other end relative to the main frame, by means of a screw 8 or the like designed to bear downwardly on the main frame and, when rotated in one direction, to swing the supplemental frame upwardly so that it will assume any desired angle relative to the main frame.

Hangers 9 extend downwardly from the front portion of the supplemental frame and are suitably braced, as indicated at 10, the lower ends of these hangers being connected by a cross beam 11 carrying harrow teeth 12 although, under some conditions, it will be found desirable to substitute plows for the purpose of loosening the soil, instead of the harrow teeth. Additional hangers 13 are also extended downwardly from the sides of the supplemental frame 6 and carry scrapers 14 which converge rearwardly and have their forward ends projecting beyond the sides of the path traveled by the soil engaging devices 12, as clearly indicated in Fig. 2.

A shaft 15 extends transversely of and is journaled upon the supplemental frame 6 and has short broad spokes 15′, preferably of wood, radiating therefrom, each of these spokes being straddled by, and attached to the inner forked end 16 of a metal spoke 17 all of these spokes 17 being disposed in a plane located beyond one side of the spokes 15′. The outer ends of the spokes 17 merge into laterally extending arms 18 to which is secured a continuous rim 19 of wood or other suitable material, this rim carrying a plurality of buckets 20 projecting outwardly therefrom and also carrying a series of smaller buckets 21 extending inwardly from the rim at the bases or bottoms of the buckets 20. It will be seen that, by employing the construction described, a considerable space is formed between the rim 19 and forked portions 16 of the spokes, this space being completely open at one side of the wheel so as to receive a hopper 22 into which the buckets are designed to successively discharge their contents. This hopper is inclined downwardly to an endless conveyer 23 mounted on rollers 24 which, in turn, are journaled in a frame 25. This

frame is pivotally mounted on a shaft 26 extending longitudinally of the machine and journaled in a frame 27 extending upwardly from the supplemental frame 6 at one side of the excavating wheel. A gear 28 is secured to the shaft 26 and meshes with another gear 29 carried by a short shaft 30 journaled in the frame 27, this latter shaft 30 being also provided with a sprocket 31. Said sprocket receives motion through a chain 32 from another sprocket 33 secured to the shaft 15 hereinbefore referred to. A shaft 33^2 having drums 33′ is carried by the upper portion of the frame 27 and adjusting cables 34 are secured thereto and to the outer end of the frame 25 so that, by winding said cables on the drum, as by means of a crank 35, the frame 25, and the endless conveyer carried thereby, can be shifted to any desired angle relative to the frame 27.

One or more arms 36 may be extended laterally from the frame 27 and above the excavating wheels, these arms being braced by rods or cables 37 and being connected to one side of the supplemental frame 6, by means of rods or cables 38 attached to a standard or to standards 39 upstanding from said supplemental frame.

A gear ring 40 is secured to the spokes 17 and meshes with a gear 41 secured to a crank shaft 42 journaled on the supplemental frame 6. This shaft is adapted to be driven by an engine 43 also mounted on said supplemental frame, it being designed to conduct steam from the boiler to the engine through pipes not shown but which have one or more flexible joints permitting movement of the frame 6 relative to the frame 1.

The machine described is designed to be drawn by a traction engine or by any other suitable means and the engine 43 is employed solely for the purpose of driving the excavating wheel and the conveyer. By means of the screw 8, the frame 6 may be shifted relative to frame 1 so as to produce a corresponding movement of the soil engaging devices 12, the scrapers 14, the excavating wheel, and all other parts connected to or carried by the supplemental frame. As the excavating wheel rotates in the direction indicated by the arrow in Fig. 1, the open ends of the buckets 20 are brought successively into engagement with the soil and the material engaged by the buckets is conveyed upwardly, gradually piling in the bucket 21 and finally discharging from the two buckets 20 and 21 into the hopper 22 which, in turn, directs the material on to the conveyer 23. Motion is transmitted to this conveyer from the shaft 15 of the excavating wheel through the gearing which has been described and such conveyer will therefore carry the material beyond the side of the machine and discharge it. By providing the teeth 12 or other similar soil engaging devices, the dirt can be loosened in advance of the scrapers and excavating wheel so as to thus greatly facilitate the operation of the machine. After the soil has been loosened, the scrapers 14 gather it into the path of the buckets so that it will be collected and elevated by them in the manner hereinbefore described. As the scrapers and the soil loosening elements extend in front of the supporting wheels of the machine and, if desired, beyond the outer sides of the wheels, it will be apparent that the path graded by the teeth 12 and the scrapers will be equal to or greater than that required to receive the machine.

What is claimed is:—

1. A machine of the class described including a wheel supported frame, an excavating wheel mounted for rotation upon an axis extending transversely of the frame, said wheel being supported between the ends of the frame, an endless conveyer extending laterally from the machine and projecting close to the wheel, means fixedly mounted upon the frame and surrounded by the wheel for directing material onto the conveyer from the upper portion of the wheel, and means operated by the wheel for actuating the conveyer.

2. A machine of the class described including a wheel supported frame, an excavating wheel carried thereby and supported between the ends thereof, said wheel being mounted for rotation about an axis extending transversely of the frame, soil loosening devices supported by the frame and in front of the excavating wheel, said devices extending laterally beyond the sides of the path of the supporting wheels, and scraping devices supported by the frame and back of the soil loosening devices, for directing the loosened soil inwardly into the path of the excavating wheel, said scrapers and wheel forming an excavation of greater width than the path of the supporting wheels of the machine.

3. A machine of the class described including a wheel supported frame, an excavating wheel carried thereby between the ends thereof, said wheel being mounted for rotation about an axis extending transversely of the machine, a hopper fixed relative to the frame and surrounded by the wheel, said hopper discharging laterally beyond one side of the excavating wheel, an endless conveyer extending laterally from the wheel and arranged to receive material from the hopper, means for transmitting motion to the conveyer from the excavating wheel, and means for swinging said conveyer relative to the wheel during the actuation of the conveyer and wheel.

4. A machine of the class described including a supporting frame, a shaft mounted for rotation, spokes radiating from the shaft,

supplemental spokes disposed in a plane at one side of the first mentioned spokes and having forked terminals straddling and secured to said first mentioned spokes, laterally extending arms at the outer ends of the supplemental spokes, a rim secured upon said arms, buckets carried by and movable with the rim, and a hopper projecting into the space between the rim and the forked terminals of the spokes.

5. A machine of the class described including a supporting frame, an endless conveyer extending laterally therefrom, a hopper discharging on to the conveyer, and an excavating wheel for directing material into the hopper, said wheel including central spokes, a rim spaced therefrom, supplemental spokes connecting the rim to the central spokes and arranged at one side of the wheel, and buckets carried by the rim, said hopper projecting into the other side of wheel and between the rim and the central spokes.

6. A machine of the class described including a supporting structure, an excavating wheel mounted for rotation, said wheel including buckets, a conveyer extending laterally from the supporting structure and wheel, a hopper for directing material from the buckets and on to the conveyer, means for transmitting motion from the wheel to the conveyer, a motor shaft, and meshing gears upon said shaft and wheel for rotating the wheel.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

CHARLES BUSHNELL DUNN.

Witnesses:
HEZ THOMPSON,
A. S. KLYON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."