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Patented Aug. 5, 1902.

C. N. OWEN.  
STONE HANDLING APPARATUS.

(Application filed Apr. 24, 1902.)

(No Model.)

2 Sheets—Sheet 1.

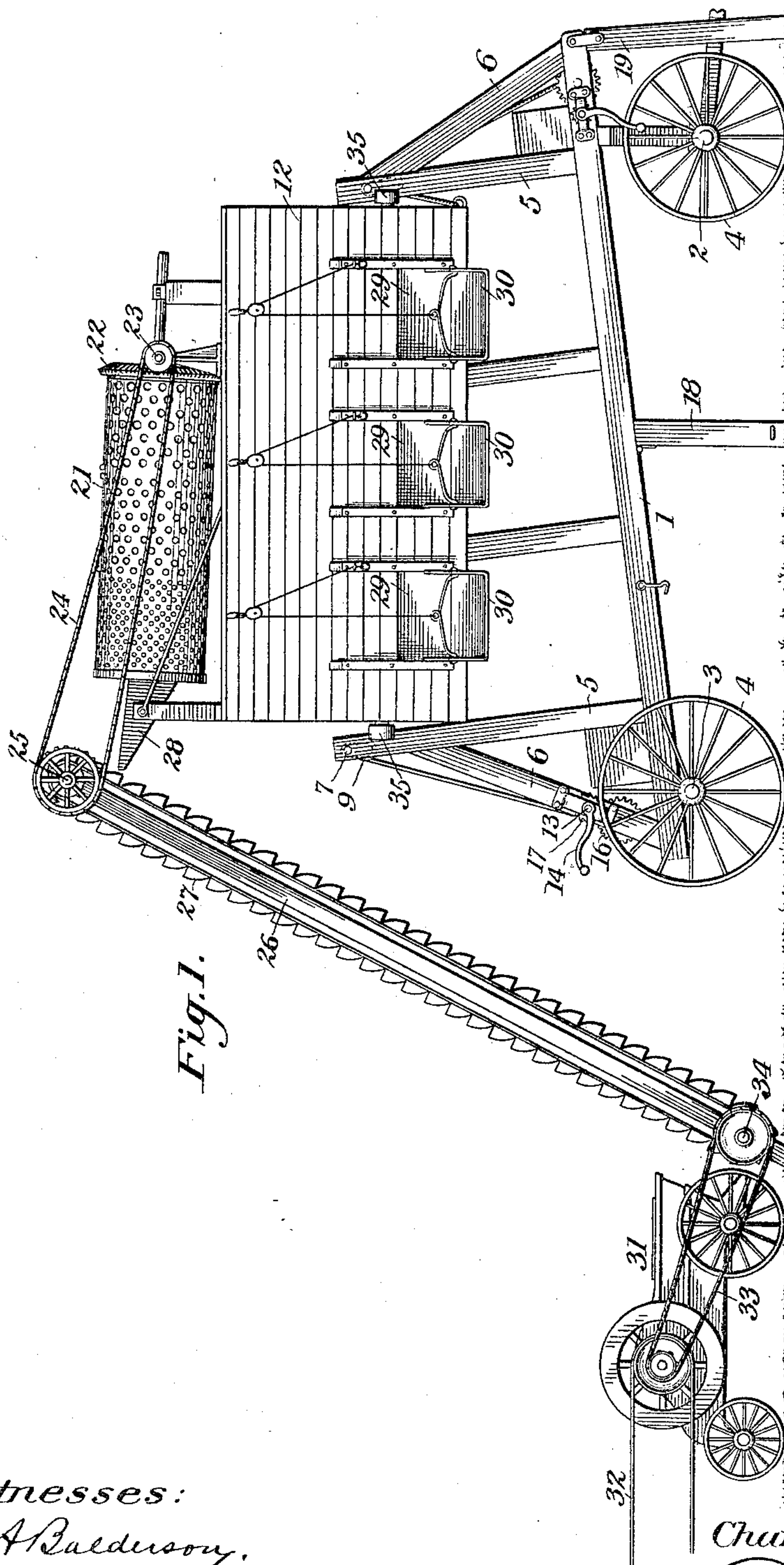


Fig. 1.

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2 Sheets—Sheet 2.

Fig. 2.

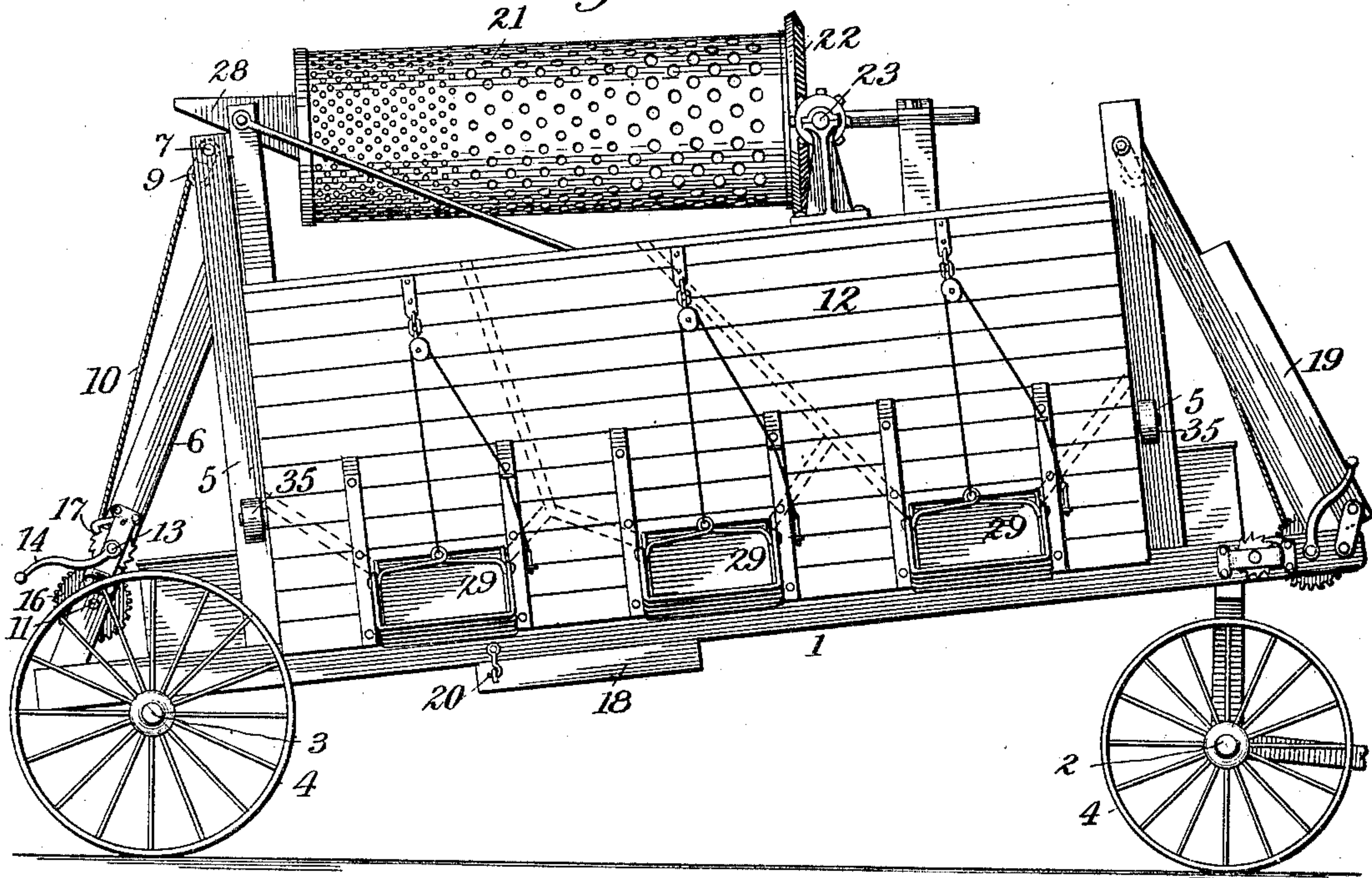
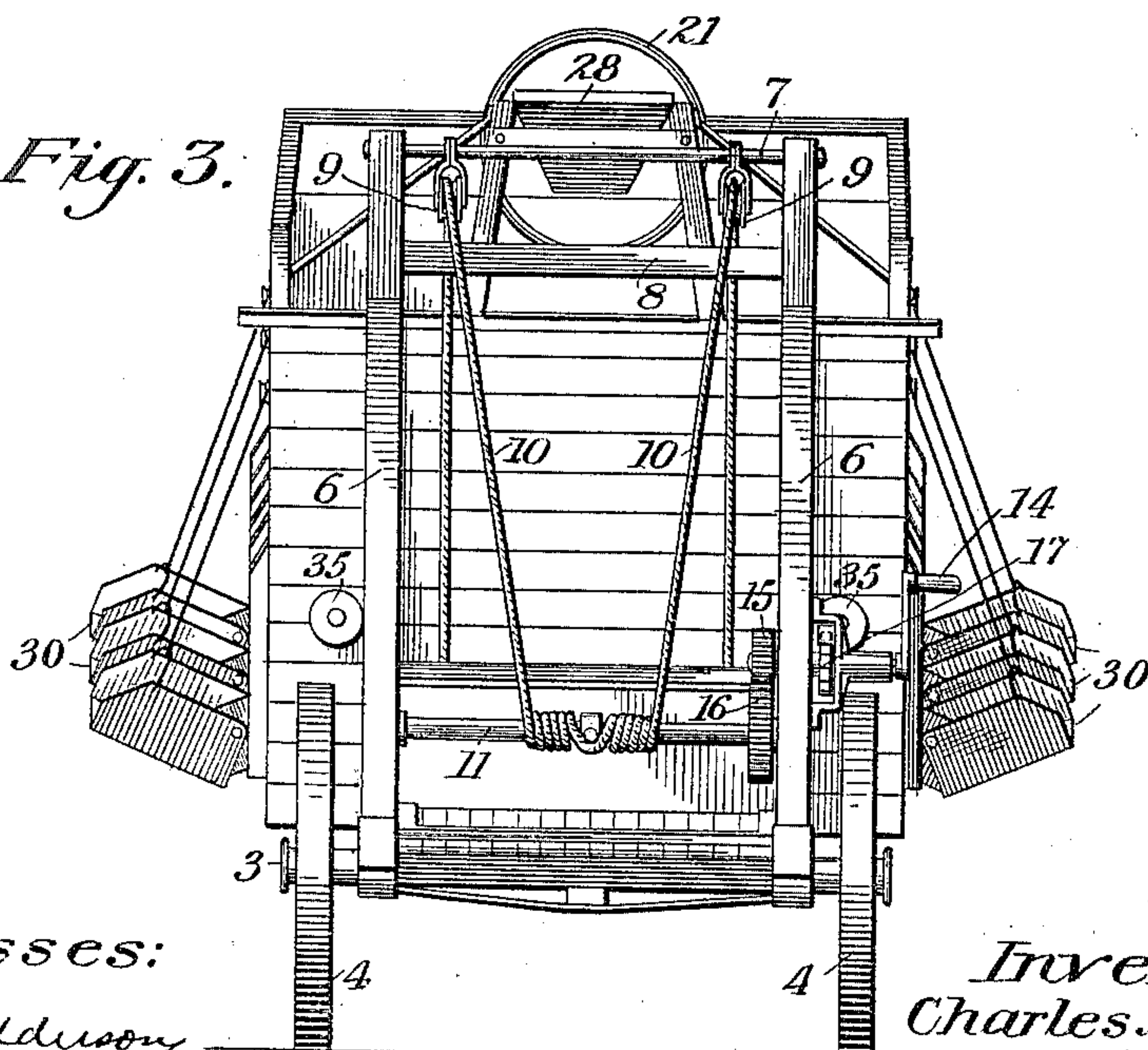


Fig. 3.



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# UNITED STATES PATENT OFFICE.

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## STONE-HANDLING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 706,197, dated August 5, 1902.

Application filed April 24, 1902. Serial No. 104,469. (No model)

*To all whom it may concern:*

Be it known that I, CHARLES N. OWEN, a citizen of the United States, residing at Mechanicsburg, in the county of Cumberland and State of Pennsylvania, have invented a certain new and useful Stone-Handling Apparatus, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to stone-handling apparatus, the object in view being to provide a complete portable apparatus for handling crushed stone from the time it leaves the crusher until it is delivered to the carts or  
15 wagons which carry the same to the point of final deposit.

In handling broken or crushed stone with a view to delivering the same into carts or wagons it has been usual to employ an elevated bin and to mount the same for transportation purposes on a carrying truck or wheels. The bin has necessarily been located at such a height above the wheels as to render the structure top-heavy and dangerous  
25 in moving the same from place to place. This disadvantage has been increased by the fact that it is necessary to thoroughly brace and support the bin at the required elevation to enable it to hold a large quantity of stone, amounting to ten or twelve tons, or even more.

One of the principal objects of this invention is to provide what may be termed a "portable stone-bin," embodying in connection with  
35 a carrying truck or wheels a bin proper combined with a mechanism for raising and lowering the bin while empty and tilting the bin or adjusting the relative height of the opposite ends of such bin. This also enables the  
40 receiving end of the screen or grader to be brought to the desired elevation to correspond with the upper discharge end of the elevator, which leads thereto from the crusher.

By means of the construction hereinafter described the bin may be lowered to rest directly on the truck-frame, thus providing for safe transportation and removal from place to place and raised to the necessary elevation while empty and preparatory to discharging  
50 the broken or crushed stone therein by means of the elevator.

The invention also relates to the particu-

lar means for raising and lowering and bracing or supporting the bin when in its elevated position.

55 With the above and other objects in view, the nature of which will more fully appear as the description proceeds, the invention consists in the novel construction, combination, and arrangement of parts, as hereinafter fully described, illustrated, and claimed.

In the accompanying drawings, Figure 1 is a side elevation of a complete stone-handling apparatus, showing a portable stone-bin with screen and other attachments and the stone-crusher and elevator associated with each other and with the bin in readiness for operation. Fig. 2 is an enlarged side elevation of the portable bin and screen, showing the bin properly lowered and resting upon the truck in readiness for transportation. Fig. 3 is an end view of the same.

Like reference-numerals designate corresponding parts in all the figures of the drawings.

75 The portable bin comprises an inclined truck-frame 1, consisting of suitable parallel longitudinal bars connected at the proper intervals by cross-bars and mounted at opposite ends upon front and rear axles 2 and 3, respectively, having carrying-wheels 4. Extending upward from the truck-frame 1, at or near the opposite ends and upon opposite sides thereof, are corner-standards 5, which are strengthened by inclined braces 6. The standards 5 are connected at the top by tie-rods 7 and at lower points by cross-bars 8, the rods 7 forming supports for pulleys 9, around which pass the ropes or cables 10 of the raising and lowering mechanism.

90 Any usual or preferred raising and lowering mechanism may be employed; but for the purpose of illustration I have shown at each end of the truck-frame a shaft or windlass 11, upon which the ropes or cables 10 are wound, as best illustrated in Fig. 3, the ends of said ropes or cables being connected with the adjacent ends of the stone-bin proper, which is indicated at 12 and which is adapted to be moved up and down between the standards 5. A short counter-shaft 13, provided with an operating-crank 14, is geared, by means of a pinion 15 and spur-gear 16, with the shaft or windlass 11, the gearing being so  
100



regulated as to give the necessary power to enable the bin to be elevated by hand. Pawl-and-ratchet mechanism 17 is employed in connection with each counter-shaft 13 to hold the bin stationary after it has been elevated to the desired position. It will of course be understood that the raising and lowering mechanism is duplicated at each end of the bin in order that the opposite ends of the bin proper may be raised and lowered independently of each other. In this way one end of the bin may be raised sufficiently to bring it into the desired relation to the discharge end of the stone-elevator, while the other end of the bin may be lowered to give the necessary inclination to the grading-screen, hereinafter described.

As the bin is ordinarily constructed of sufficient size to receive ten or twelve tons of broken or crushed stone, it is important to provide means for bracing and supporting the bin when in an elevated position, so as to remove the greater portion of the weight from the raising and lowering mechanism and also from the wheels and axles of the truck. To this end props or braces 18 and 19 are employed, the braces 18 being hinged to the truck-frame 1 and adapted to fold downward and rest on the ground, as shown in Fig. 1, the braces or props 19 being hingedly connected to the end portion of the truck-frame, while the braces 18 are located at an intermediate point and preferably about midway between the front and rear axles. When in use, the braces 18 and 19 are adapted to be folded upward to the position shown in Fig. 2, where they may be held by suitable hooks and eyes or other fastening devices 20.

Mounted upon the top of the bin 12 is a cylindrical rotary grading-screen 21, which has an inclined relation to the top of the bin, as shown in Figs. 1 and 2. This screen is open at both ends and mounted in any suitable bearings on the top of the bin, so as to rotate freely, and is provided at one end with a beveled gear 22, driven by a pinion on a short transverse shaft 23, also provided with a sprocket-wheel adapted to receive a drive-chain 24, which passes around another sprocket-wheel on the shaft 25 at the upper or free end of the stone-elevator, (shown at 26.) The screen 21 is adapted to receive the stone from the elevator, the stone being discharged from the elevator-buckets 27 upon or into a chute 28, which leads into the front end of the rotary screen. The bin is divided by transverse partitions into a series of compartments with inclined floors and the screen is graded or provided with openings of different sizes at different points in its length, so as to separate or grade the stone and discharge the same into the proper compartments of the bin. Each compartment is provided at opposite sides of the bin with discharge-openings 29, in front of which are arranged hinged discharge-chutes 30, provided with suitable raising and lowering tackle,

which enables the chutes to be sustained at any desired angle of inclination or folded upward out of the way for transportation. 70

A stone-crusher 31 of any preferred construction may be employed in connection with the elevator 26, the crusher being driven by a belt 32 from any suitable motor and the elevator being driven by a belt or chain 33, passing over the shaft of the crusher and the lower shaft 34 of the elevator. 35 designates antifrictional rollers mounted on the bin at proper places to travel against the corner-standards 5, said rollers serving to properly position and guide the bin as it is raised or lowered and also preventing any binding or cramping of the bin as it is moved upward or downward. 75 80

The portable stone-bin is driven to the point of operation while the bin proper is in its lowered position. (Illustrated in Fig. 2.) Under this arrangement the portable bin may be moved with perfect safety, as it is not too heavy, as would be the case were the bin permanently sustained in an elevated position, as shown in Fig. 1. After reaching the place of operation the bin is elevated by the raising mechanism hereinabove described and while the bin is empty. By reason of the independent raising and lowering devices at opposite ends of the bin the receiving-chute 28 may be accurately adjusted into the proper relation to the discharge end of the elevator 26 after the elevator and crusher have been associated together and arranged in line with the portable bin in the manner illustrated in Fig. 1. The bin 12 may then be given the desired longitudinal inclination to cause the stone to work its way along the length of the grading-screen 21 as the latter revolves. The stone broken by the crusher 31 is discharged upon the elevator, the latter carrying the crushed stone upward and delivering it into the rotary screen, which in turn grades the stone and discharges it into the bin-compartments. Carts or wagons may then be driven under the proper discharge-chute 30, according to the grade of stone required at the time, and after the carts or wagons are loaded the chute 30 may be partially raised to shut off the discharge of stone. When operations have been completed, the bin may be entirely emptied of its contents and then lowered, so as to rest upon the carrying-truck frame 1, the apparatus being then ready for movement to another point of operation. 85 90 95 100 105 110 115 120

It will of course be understood that the invention is susceptible of changes and modifications in the construction and arrangement hereinabove described, and I therefore reserve the right to make such changes as properly fall within the scope of the appended claims. 125

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is— 130

1. Stone-handling apparatus comprising a carrying-truck, a portable bin mounted there-



on, means for raising and lowering the bin, and a stone-elevator adapted to deliver to the bin, substantially as described.

2. Stone-handling apparatus comprising a carrying-truck, a portable bin mounted thereon, means for raising and lowering the bin, a screen at the top of the bin for receiving stone, and a stone-elevator adapted to discharge into the screen, substantially as described.

3. Stone-handling apparatus comprising a carrying-truck, a portable bin mounted thereon, means for raising and lowering the bin, a screen at the top of the bin, a stone-elevator arranged to discharge into the screen, and a stone-crusher arranged to deliver to the elevator.

4. Stone-handling apparatus comprising a carrying-truck, a portable stone-bin thereon, means for raising and lowering the bin, a screen mounted at the top of the bin and adjustable therewith to receive the stone from an elevator and direct the same into the bin, a stone-elevator arranged to discharge into the screen, and a stone-crusher to which the elevator is connected and upon which it is adjustable.

5. Stone-handling apparatus comprising a carrying-truck, a portable stone-bin mounted thereon, means for raising and lowering the bin and the screen, a rotary stone-grading screen at the top of the bin arranged to receive the stone and discharge into the bin, and a stone-elevator arranged to deliver to the screen.

6. Stone-handling apparatus, comprising a carrying-truck, a stone-bin mounted thereon, a stone-grading screen at the top of the bin,

and means for independently raising and lowering the opposite ends of the bin.

7. Stone-handling apparatus comprising a carrying-truck, a bin mounted thereon, a stone-grading screen at the top of the bin, means for independently raising and lowering the opposite ends of the bin, and movable props for supporting the bin when elevated.

8. Stone-handling apparatus comprising a portable truck, a stone-bin mounted thereon, a stone-grading screen at the top of the bin, means for raising and lowering the bin, and movable props for bracing and supporting the truck and bin, substantially as described.

9. Stone-handling apparatus comprising a portable truck, a stone-bin mounted thereon, a stone-grading screen at the top of the bin, means for raising and lowering the bin on the truck, and truck-supporting props or braces having a hinged connection with the truck-frame, substantially as described.

10. Stone-handling apparatus comprising a portable truck, having a longitudinally-inclined frame, a stone-bin mounted thereon, a stone-grading screen at the top of the bin, means for raising and lowering the bin, and removable props or braces adapted to be placed with a wedging fit between the inclined truck-frame and the elevated bin, substantially as described.

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

CHARLES N. OWEN.

Witnesses:

H. H. MERCER,  
W. B. WISTER.