

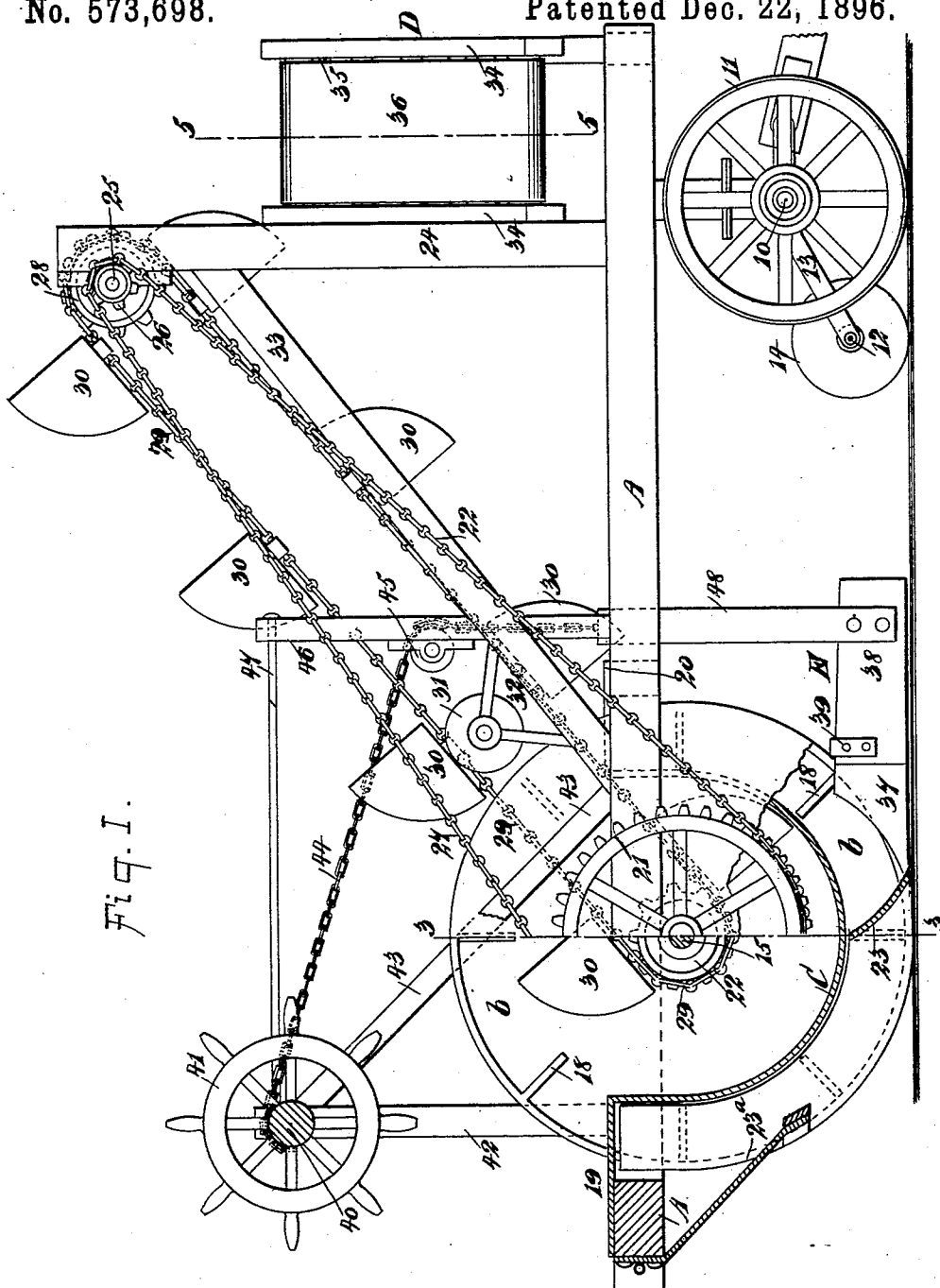
(No Model.)

2 Sheets—Sheet 1.

F. M. PHILLIPS & E. STEBINGER.
EXCAVATOR.

No. 573,698.

Patented Dec. 22, 1896.



WITNESSES:

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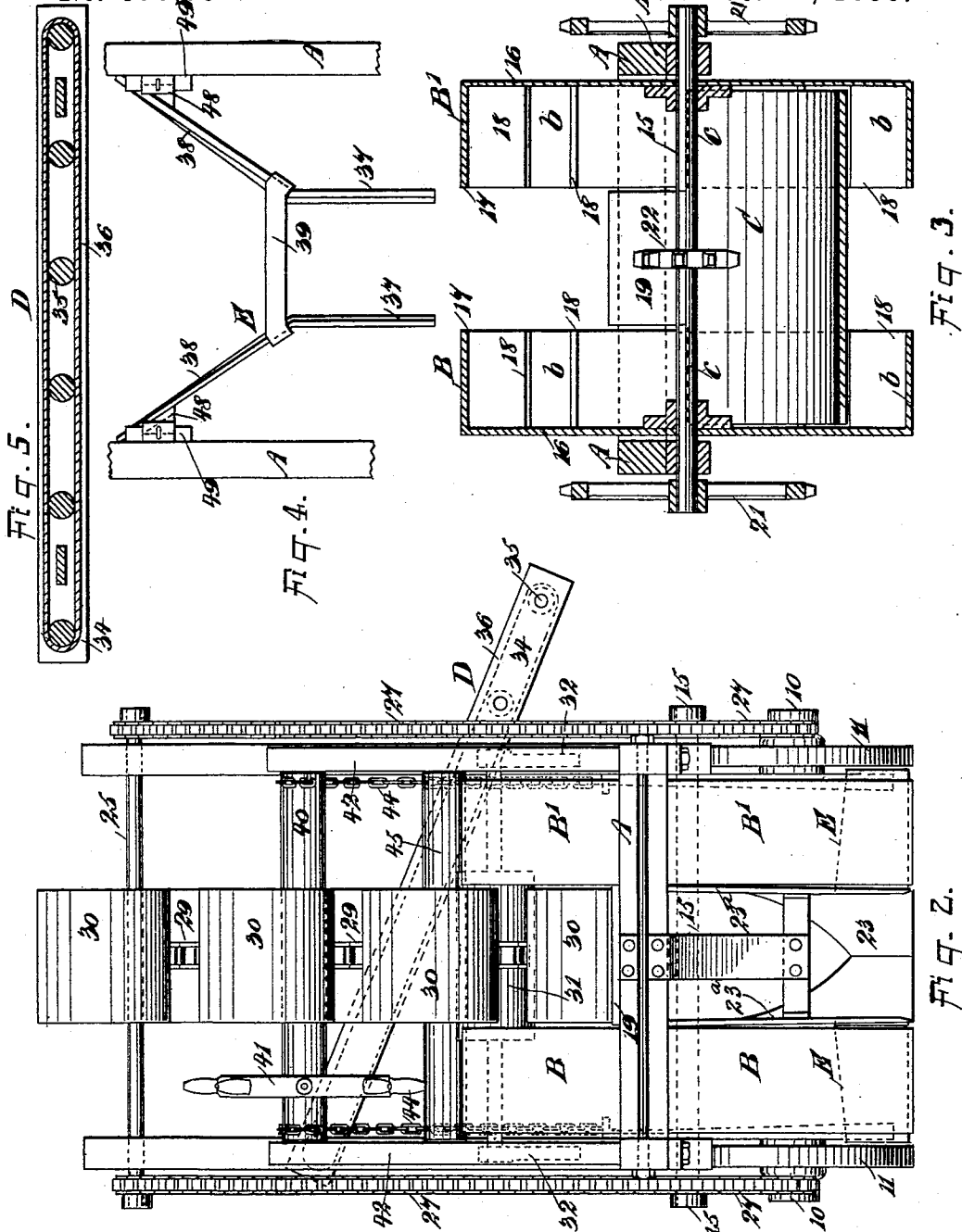
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WITNESSES:

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UNITED STATES PATENT OFFICE.

FRANCIS M. PHILLIPS AND EUGENE STEBINGER, OF PORTLAND, OREGON.

EXCAVATOR.

SPECIFICATION forming part of Letters Patent No. 573,698, dated December 22, 1896.

Application filed March 25, 1896. Serial No. 584,819. (No model.)

To all whom it may concern:

Be it known that we, FRANCIS M. PHILLIPS and EUGENE STEBINGER, of Portland, in the county of Multnomah and State of Oregon, have invented a new and useful Improvement in Excavators, of which the following is a full, clear, and exact description.

Our invention relates to a machine primarily adapted as an excavator, but capable of use also as a scraper, ditcher, or wagon-loader.

The object of the invention is to construct a machine of this character in a very simple, durable, and economic manner and to provide for the earth being broken by a plow and conducted by scrapers to pocket-wheels, from whence the earth is delivered to a basin, being taken from the basin by an elevator and carried to a conveyer, from whence it is delivered at one side of the machine into any suitable receptacle placed to receive the earth.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the machine, a portion of the rear at one side being broken away to show parts of the interior of one of the pocket-wheels, a sectional view of the plow, and a partial sectional view of the basin located between the pocket-wheels. Fig. 2 is a rear elevation of the machine. Fig. 3 is a vertical section through the pocket-wheels, taken substantially on the line 3 3 of Fig. 1. Fig. 4 is a detail plan view of a portion of the frame and likewise a plan view of the scrapers, illustrating the position of the latter and the guides located on the frame to regulate their upward movement; and Fig. 5 is a longitudinal section through the conveyer, the section being taken substantially on the line 5 5 of Fig. 1.

In carrying out the invention the base-frame A of the machine is preferably made somewhat rectangular and of skeleton construction, being supported at the front by a pivoted axle 10, having ground-wheels 11 mounted thereon of the ordinary character, and a shaft 12 is supported at the rear of the for-

ward axle through the medium of arms 13, projected downwardly and rearwardly from said axle, and any desired number of slicing wheels or disks 14 are carried by the aforesaid shaft 12.

The rear axle 15 is journaled in suitable bearings in the base-frame A, as shown in Fig. 4, and upon the said rear axle two wheels B and B' are secured, the wheels being spaced a predetermined distance apart, as shown particularly in Fig. 3, and each wheel consists of a disk-body 16 and a marginal flange 17, extending inward from the body. A series of radial projections 18 is secured at the inner peripheral portion of each of the wheels B and B', forming thereby a number of pockets b, and the said pockets are open at their inner sides and at their inner ends, so that the material may escape from the pockets in direction of the center of the wheels or in direction of the space between the wheels, or both.

A plate C is placed beneath the rear axle 15, and the said plate is of sufficient width to extend within the flanged portion of each pocket-wheel to a point quite close to the inner face of its side or disk section, as is shown best in Fig. 3. This plate is of segmental form and is so curved that it will extend over and quite near to the inner side edges of the pockets in the pocket-wheels as the said wheels revolve. The upper edges of the plate C, which are within the pocket-wheels, terminate at a point near a line drawn horizontally and about centrally through the wheels, as indicated by the dotted lines c in the aforesaid Fig. 3.

A tongue 19, which is integral with the central portion of the plate C, is made to extend upward above the rear upper margin of the plate at the sides and between the pocket-wheels. The said tongue is then carried rearward, usually in a horizontal direction, and attached to the rear portion of the main frame, as shown in Fig. 1, and a similar tongue 20 is carried upward in like manner from the front central portion of the plate and is attached to an intermediate cross-bar secured to the base-frame, as shown also in Fig. 1.

The curved plate C forms practically a basin within the pocket-wheels, and any material that is received by the bottom pockets, when the said pockets are carried to a point

above the upper rear edge of the said basin, will drop the material into the said basin and pass forwardly to receive another load.

A sprocket-wheel 21 is secured to the outer ends of the rear axle 15, and a sprocket-pinion 22 is loosely mounted upon the central portion of the aforesaid rear axle. The plow 23 is carried or located below the central portion of the basin formed by the plate C, the said plow being substantially triangular in horizontal section, and from the rear end of each member of the plow a shank 23^a is carried upward beneath the rear tongue 19 of the basin-plate, as shown in Figs. 1 and 2, and secured to the base-frame in any suitable or approved manner; but the closed forward portion of the plow, or that portion which makes the furrow, will extend from the ground practically to the bottom of the basin-plate and from the opposing lower pockets of the pocket-wheels, so that the earth which is turned up by the plow will surely find its way into the lower pockets of the pocket-wheels.

A shaft 25 is journaled in suitable bearings in the upper ends of standards 24, located near the front side portions of the base-frame. A sprocket-pinion 26 is secured upon each outer end of the shaft 25, and endless chain belts 27 are carried over the said sprocket-pinions and likewise over the sprocket-wheels 21 on the rear axle. In this manner the upper shaft 25 is driven from the rear axle, the axle being turned by the pocket-wheels.

A sprocket-pinion 28, larger than the end pinions 26, is secured at or near the center upon the upper shaft 25, and in fact the upper sprocket-pinion 28 is about the same diameter as the sprocket-pinion 22, which is loosely mounted on the axle. An endless chain belt 29 is passed over the opposing sprockets 22 and 28, and buckets 30 are secured to the outer face of the aforesaid chain, the surfaces of the buckets facing the chain being flat and their back surfaces convexed, while the mouths of the buckets on the upper stretch of the said belt face forwardly, and the mouths of the buckets on the lower stretch face in a rearwardly direction. The buckets and chain constitute an elevator, and the buckets on the lower stretch of the belt will enter the basin formed by the plate C, their convexed surfaces coinciding substantially with the concaved face of the basin, and the buckets entering the basin will scrape up the earth deposited therein by the pockets in the pocket-wheels.

In order that the chain of the elevator shall not sag to any appreciable extent as the filled buckets are carried upward, an idler 31 is made to engage with the under face of the upper stretch of the elevator-chain, being journaled in bearings 32, secured upon beams 33 at the sides of the machine and extending from the upper portion of the front uprights 24 to the sides of the base-frame A, as shown in Fig. 1.

The earth is deposited by the buckets 30

upon a conveyer D, and this conveyer occupies an inclined position at the front of the machine, extending downwardly and in direction of as well as beyond one side of the machine. The aforesaid conveyer ordinarily consists of two side beams 34, both of which may be supported, the inner side beam being attached to the uprights 24, and the said side beams may, furthermore, be tied together by cross-braces, as shown in Fig. 5. The conveyer is of the gravity type, and a series of rollers 35 is journaled in its side beams, while an endless apron 36 is passed around said rollers. Consequently the dirt delivered upon the conveyer will by its inertia cause the endless apron to revolve and deliver the received material to the wagon or other receptacle placed to receive it.

Scrapers E are employed, (shown best in Figs. 1 and 4,) and the said scrapers are of an angular type, each comprising a straight member 37, extending longitudinally beneath the base-frame, and an inclined member 38, which is carried outward to the forward portion of the frame at the side adjacent to which the scraper may be located. The parallel straight members 37 of the scrapers are made to enter the space between the pocket-wheels immediately in front of the plow 23, and the inclined members 38 diverge forwardly in opposite directions, and the two scrapers are preferably tied together by a strip 39, located ordinarily at the junction of their members.

The scrapers are adapted to be raised and lowered, as occasion may demand, and this is accomplished by journaling a drum 40, provided with a hand-wheel 41 between uprights 42, placed at the rear of the machine and sustained by diagonal braces 43, chains 44 being attached to the drum at or near its ends and passed over a roller 45, journaled in bearings on uprights 46, located in advance of the pocket-wheels and tied to the rear uprights 42 by horizontal braces 47 or their equivalents.

The inclined portion of each of the scraper-blades has a shank 48 attached to it, and these shanks are passed upward through guides 49, located upon the inner faces of the side beams A of the base-frame, as shown in Fig. 4, the chains 44 being attached to the upper ends of the aforesaid scraper-shanks.

In the operation of the machine the plow will cut the furrow of earth, the scrapers will act in conjunction with the said plow, and the plow and scrapers will direct the material removed to the lower pockets of the pocket-wheels. As the pockets ascend they will deliver their contents upon the basin formed by the plate C, from whence the material will be taken by the buckets 30 of the elevator and delivered to the conveyer D, from whence it will be conducted to any suitable receptacle. The scrapers may be raised and lowered through the medium of the drum 40 and its connections with the scrapers, as heretofore described.

If in practice it is found desirable, angle-plates may be attached to the sides of the machine to incline or bevel the sides of the ditch formed by the body portion of the machine. With slight modifications the machine may be used for cleaning streets or for cleaning roads.

By using scrapers and plows, receiver and conveyer made of heavy wire-netting, and by making the flanges of the large side wheels either perforated or of heavy wire-netting, the machine can be used for gathering potatoes, beets, &c., the wire-netting allowing the dirt taken up with the potatoes, beets, &c., to drop through the loops and so only deposit the potatoes, beets, &c., taken up by the machine in wagons following alongside the machine.

It is absolutely necessary that before using the machine for excavating or ditching, the ground be plowed over first, to do away with all friction in working the machine.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. In an excavating-machine, the combination of pocket-wheels placed at predetermined intervals apart, a basin located between the pocket-wheels, adapted to receive the material from their pockets, an elevator adapted to remove the material from the basin, and a conveyer placed to receive the material from the elevator, as and for the purpose specified.

2. In an excavator, a frame, the combination of wheels located at the rear of the frame, an axle upon which the wheels are secured, each wheel being provided with interior peripheral pockets, a basin fitted to the lower pockets of the wheels and secured to the said frame, an elevator comprising an endless belt and buckets, driven from the said rear axle, and a conveyer located at the forward portion of the elevator and receiving the material from the buckets, which material is taken up by said buckets from the aforesaid basin, as and for the purpose specified.

3. In a machine for excavating purposes, the combination of a frame, pocket-wheels adapted as supports for the said frame, a basin located between the pocket-wheels, receiving the material from the pockets thereof, a plow placed beneath the basin, having its shares shaped to deliver the material into the lower pockets of the pocket-wheel, an elevator adapted to take material from the said basin, and scrapers located in advance of the pocket-wheels, having members extending between the said wheels, coinciding with the side lines of the plow, being also provided with members extending forwardly and diverging outwardly, and supports for the said scrapers, as and for the purpose specified.

4. In an excavating-machine, the combination of a frame, a rear axle, pocket-wheels secured upon the said axle, a shaft journaled

above the frame, a driving connection between the axle and the said shaft, a fixed basin located between the pocket-wheels and extending over the lower series of pockets, receiving the material from the upper series, a plow secured beneath the basin and arranged to throw material into the lower pockets of the pocket-wheels, scrapers placed in front of the plow and directing material thereto and to the pockets of the pocket-wheels, a support for the said scrapers, and a bucket-elevator driven from the said shaft and guided from the rear axle, the buckets being arranged to take material from the aforesaid basin, as and for the purpose set forth.

5. In an excavating-machine, the combination of a frame, a rear axle, pocket-wheels secured upon the said axle, a shaft journaled above the frame, a driving connection between the axle and the said shaft, a fixed basin located between the pocket-wheels and extending over the lower series of pockets, receiving the material from the upper series, a plow secured beneath the basin and arranged to throw material into the lower pockets of the pocket-wheels, scrapers placed in front of the plow and directing material thereto and to the pockets of the pocket-wheels, a support for the said scrapers, and a bucket-elevator driven from the said shaft and guided from the rear axle, the buckets being arranged to take material from the aforesaid basin, and means, substantially as described, for raising and lowering the scrapers, and colters located in advance of the scrapers, as and for the purpose specified.

6. In an excavating-machine, the combination of a frame, a rear axle, pocket-wheels secured upon the rear axle, a shaft journaled above the frame, a driving connection between the axle and the said shaft, a fixed basin located between the pocket-wheels and extending over the lower series of pockets, receiving the material from the upper series, a plow secured beneath the basin and arranged to throw material into the lower pockets of the pocket-wheels, scrapers placed in front of the plow and directing material thereto and to the pockets of the pocket-wheels, a support for the said scrapers, a bucket-elevator driven from the said shaft and guided from the rear axle, the buckets being arranged to take material from the aforesaid basin, means, substantially as described, for raising and lowering the scrapers, and colters located in advance of the scrapers, and a gravity-conveyer located in front of the elevator, receiving the material from its buckets and extending beyond one side of the said machine, as and for the purpose described.

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Witnesses:

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W. H. DEDMON, Jr.