

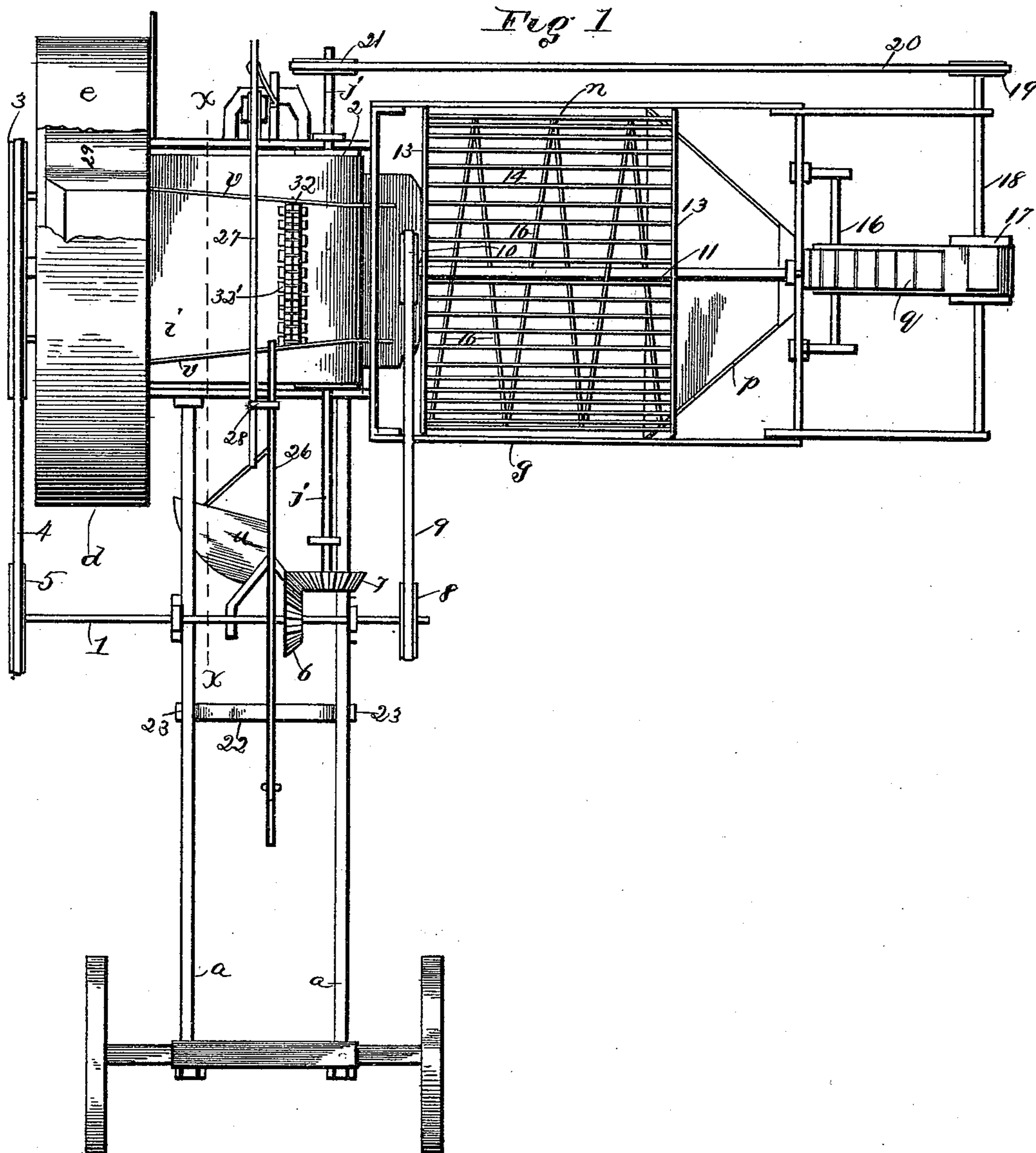
(No Model.)

4 Sheets—Sheet 1.

C. TONSAGER.
POTATO DIGGER.

No. 438,963.

Patented Oct. 21, 1890.



Witnesses
C. C. Burdine.
H. E. Peck

Inventor
Carl Tonsager
per O. E. Duffy
att'y.

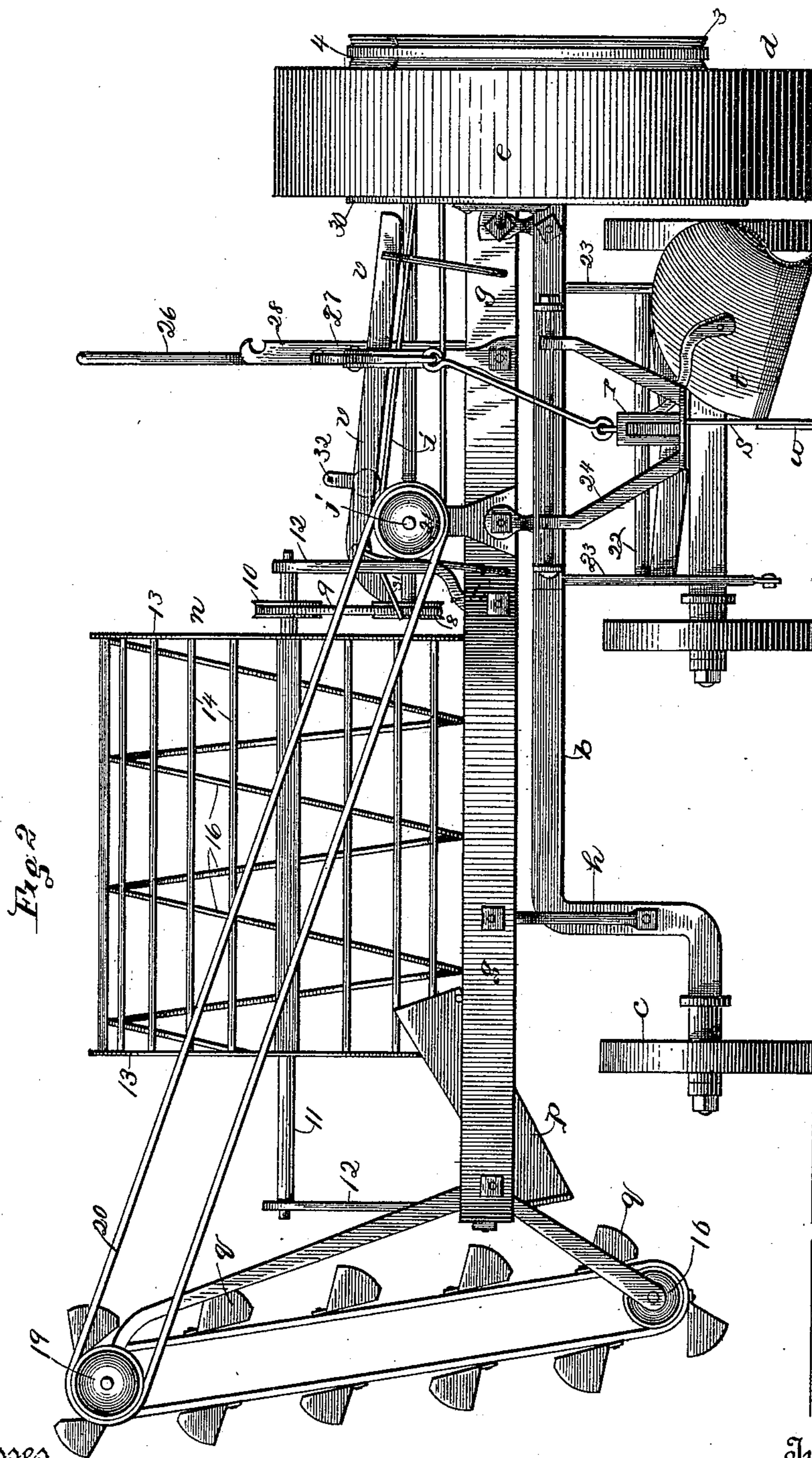
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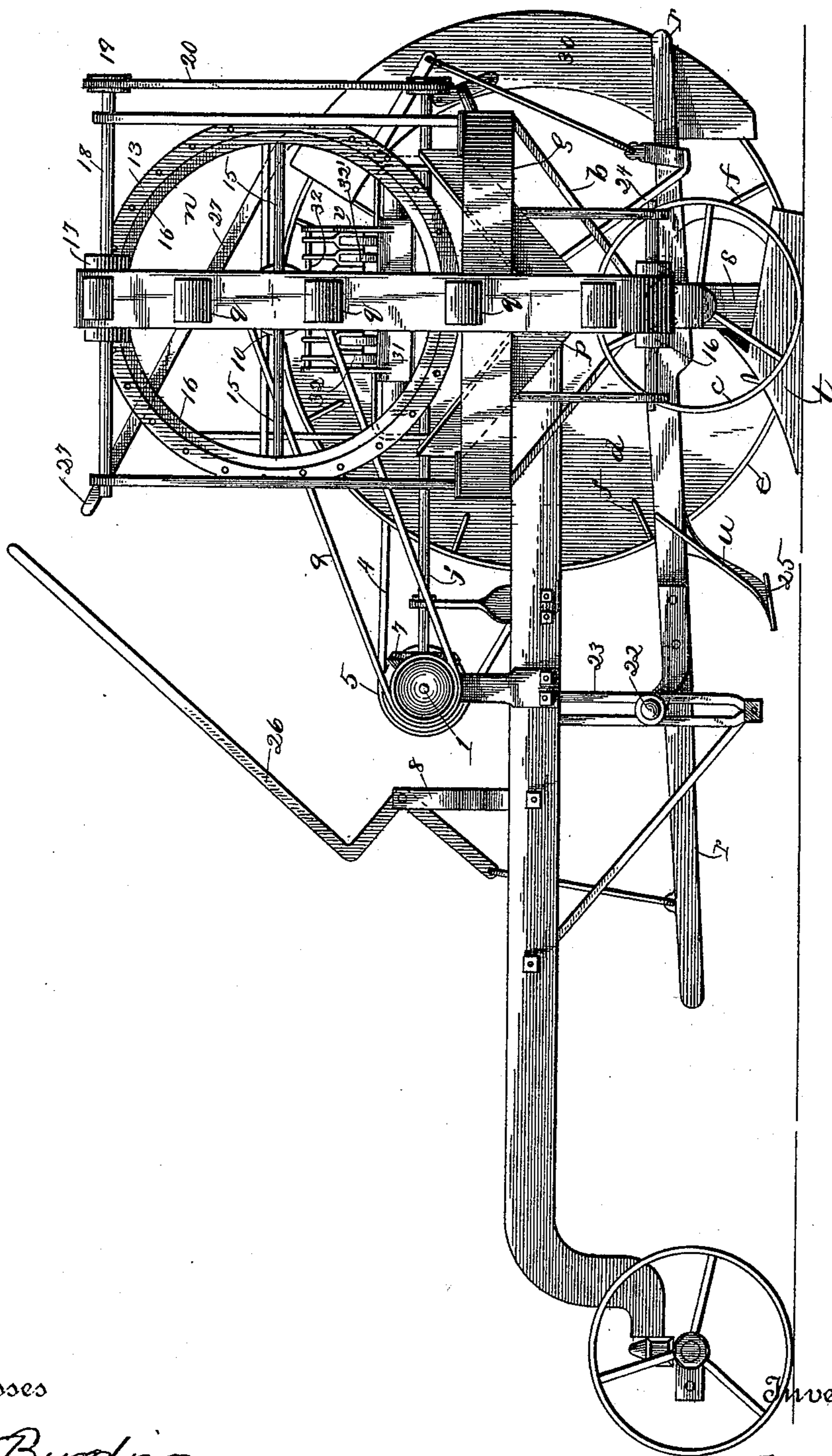
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Fig. 3



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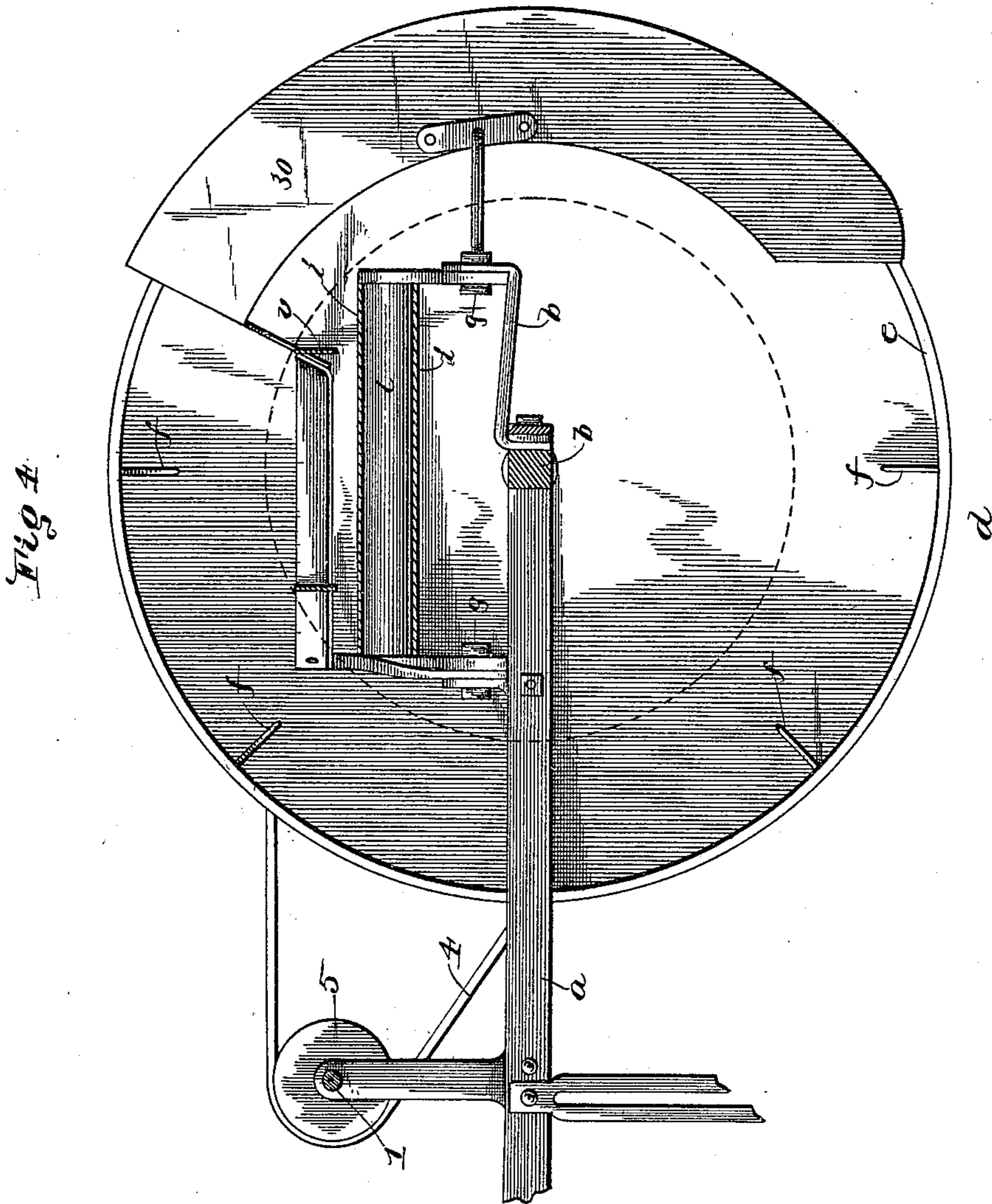
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UNITED STATES PATENT OFFICE.

CARL TONSAGER, OF MOORHEAD, MINNESOTA.

POTATO-DIGGER.

SPECIFICATION forming part of Letters Patent No. 438,963, dated October 21, 1890.

Application filed May 31, 1890. Serial No. 353,826. (No model.)

To all whom it may concern:

Be it known that I, CARL TONSAGER, of Moorhead, in the county of Clay and State of Minnesota, have invented certain new and useful Improvements in Potato-Diggers; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form part of this specification.

This invention relates to certain improvements in potato-diggers; and it consists in certain novel features of construction and in combinations of parts, more fully described hereinafter, and particularly pointed out in the claims.

Referring to the accompanying drawings, Figure 1 is a top plan, a portion of the elevating-wheel being broken away. Fig. 2 is a rear elevation. Fig. 3 is a side elevation. Fig. 4 is a section on the line *xx*, Fig. 1.

In the drawings, the reference-letter *a* indicates the double reach or frame composed of two parallel beams bent down at their front ends and loosely secured to the front guiding and supporting truck, which is mounted on two wheels and to which the horses or power are attached. These two beams are braced and secured together, and the main axle *b* is rigidly secured to their rear ends and is extended a suitable distance to the left and bent down to receive the small wheel *c*, journaled thereon. The large elevating-wheel *d* is journaled on the other end of said axle. This wheel is preferably closed, as shown, and provided with a very wide annular rim or tire, forming an inwardly-projecting annular flange *e*, which flange on its inner side is provided with a series of equally-spaced inwardly and radially extending straight wings or elevating-buckets *f*, formed irregular or toothed on their inner longitudinal edges.

g is a transverse horizontal main supporting-frame above and parallel with the main axle and rigidly and strongly secured thereto by supporting-braces *h*. At the left this frame extends beyond the axle.

i is a broad traveling belt or conveyer, at one end extending within the elevating-wheel beneath the upper portion of the flange thereof. This conveying-band is above the inner end, with its upper side traveling toward the other or discharging end of the transverse frame, and at its inner end this band is mounted on a roller, and at its opposite end on driving-roller 2, rigid on driving-shaft *j*, extending transversely above the main supporting-frame parallel with the reach and suitably mounted.

3 is a large driving-wheel on the outer side of the main elevating-wheel, connected by belt or sprocket-chain 4 with the pinion 5 on one end of transverse driving-shaft 1, mounted in suitable bearings carried by the reach. This shaft is provided with a beveled gear 6, meshing with a corresponding gear 7 on the front end of driving-shaft *j*, thereby driving said shaft in the proper direction.

8 is a driving-wheel on the end of shaft 1, connected by belt or sprocket-chain 9 with and driving a wheel 10, rigid with the shaft 11 of the separating-reel *n*, above and longitudinal of the main frame. The reel-shaft is mounted in suitable supports 12, and the reel consists of the circular end pieces 13, connected by longitudinal rods 14, located such a distance apart as to allow the dirt and earth to fall between the same but retain the potatoes therein. The reel is secured to its shaft by the radial arms 15, as shown, and is provided with an internal spiral web or flange 16, extending from the inlet to the discharge end of the reel to convey the potatoes through the reel.

p is a spout or trough beneath the discharge end of the reel to catch the potatoes as they fall from the reel, and tapering or sloping to a discharge-mouth. The buckets *q* of an endless conveyer pass up in front of this discharge-mouth and catch the potatoes as they fall from the spout and carry them up and drop them into a wagon or vehicle traveling along the side of the digger. This conveyer at its lower end passes around a roller 16, mounted beneath the end of the main frame, and extends up to a pulley 17 on a shaft 18 a distance above said frame, and this shaft

18 is provided with a wheel 19, connected by band or sprocket-chain 20 with a wheel 21 on the rear end of shaft *j*.

r is a vertically-movable horizontal plow-beam longitudinally suspended beneath the reach and having vertical standard *s* rigidly secured thereto and carrying the side turning-plow *t*, opposite the inner side of the elevating-wheel and arranged to throw earth and potatoes upon the lower side of the projecting rim of said wheel. At its front end this plow-beam is adjustably mounted by a cross head or bar 22, confined in suitably-braced vertical slotted bars 23, depending from the reach. At its rear end the plow-beam is movably carried by a depending swinging bracket 24.

u is an inclined scraper or blade in front of the plow, carried by a standard depending from the plow-beam. This blade is designed to cut the weeds and vines from the row and throw them laterally out of the line of the plow. A plate or guard 25 extends rearwardly from the lower cutting-edge of this blade to prevent potatoes pulled up by the blade from rolling laterally out of reach of the plow. This plow-beam is raised from or lowered to working position and held in the desired position by means of a pair of levers 26 27, fulcrumed on suitable stationary supports, the lever 26 being connected at its front end with the front end of the plow-beam, with its handle end extending rearwardly above the reach, while the other lever 27 has its rear end loosely connected with swinging brackets 24 and its front end extending forwardly transversely above the main frame. The two levers are held with their handle ends lowered, holding the plow-beam and plows from working position, by means of a vertical rigid rack or catch bar 28, and when it is desired to place the plow in working position said two levers are released from the rack-bar, and the beam and its attachments will drop to operative position by gravity.

When the machine is at work, the plow opens a furrow through the hills containing the potatoes and throws the mixed earth and potatoes laterally onto the rim of the elevating-wheel, and as said wheel revolves the internal radial wings *f* lift up the earth and potatoes through a passage at the rear side of the rim formed by a curved plate 29, extending into the elevating-wheel within the rim and at the inner edges of said wings, and a side plate 30 at the outer ends of said wings, said casings 29 and 30 being stationarily held by a bracket or brackets. As before mentioned, wings *f* force the earth and potatoes up through said casing, which is provided with a discharge-opening above the inner end of traveling belt *i*, and are discharged onto said belt. This belt is provided with guiding-strips *v* at ends and edges to prevent the potatoes falling from the belt, and with an inclined plate 31 at its discharge end to guide the earth and potatoes into the induction end

of the separating-reel. The guides *v* and plate 31 are stationarily supported by suitable brackets. A suitably-supported stationary rod or shaft 32 extends transversely above the belt *i*, and a series of crushers or breakers 32' are loosely mounted thereon, each in the present instance consisting of a sheave at its upper end mounted on said rod, so that its lower portion, in which a wheel is mounted bearing on the belt *i*, can swing in the direction of movement of said belt. As the belt *i* conveys the earth and potatoes from the wheel into the induction end of the separator the crushers break and pulverize the earth. The potatoes are conveyed through the separator by the spiral flange or screw therein, and the earth is thoroughly separated from the potatoes and discharged and sifted through the open periphery thereof, while the potatoes are discharged into the trough *p* and fall from the same into the buckets *q* of the elevator, which discharges the potatoes into the wagon.

If desired, the elevator to the wagon can be dispensed with and the potatoes can be delivered directly from spout *q*, and, if desired, a platform can be located at the outer end of the main frame for the accommodation of operators, who can fill bags with potatoes from spout *q* and tie the bags and drop them as the machine proceeds.

It is evident that various changes might be made in the form and arrangement of the parts described without departing from the spirit and scope of my invention. Hence I do not wish to limit myself to the exact construction herein set forth.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a potato-digger, a supporting-frame and opening-plow, in combination with the elevating-wheel, the separator, and the traveling apron conveying the earth and potatoes from said wheel to the separator, substantially as described.

2. In a potato-digger, the combination of the plow, the elevating-wheel, and a rotary separator into which the earth and potatoes from said wheel are delivered, substantially as described.

3. In combination, in a potato-digger, the side turning-plow, the elevating-wheel, the open rotary horizontal separating-reel having an internal spiral flange extending there-through, and the conveyer carrying the earth and potatoes from the wheel into one end of said reel, substantially as described.

4. In a potato-digger, the combination of the elevating-wheel, a side turning-plow acting therewith, the open rotary horizontal separating-reel, into one end of which the earth and potatoes from said wheel are discharged, and the inclined discharge-trough beneath the discharge end of said reel, substantially as described.

5. In a potato-digger, the combination of the

plow-elevating wheel, the rotary separating-reel, the apron conveying the earth and potatoes from the wheel to said reel, and crushers mounted above said apron to pulverize the
5 earth conveyed along the same, substantially as described.

6. In a potato-digger, the combination, with an apron to convey the earth and potatoes to a separator, of the series of crushers loosely
10 mounted above the apron to act on the earth on the apron, substantially as described.

7. In a potato-digger, the combination of the supporting-frame, the elevating-wheel having an inwardly-projecting annular head provided with the internal lifting-wings, the casing through which said wings travel when
15 moving up, and the plow to throw the earth and potatoes upon said tread, substantially as described.

20 8. In a potato-digger, the combination of the main frame, a main axle carrying the same, a small wheel on the outer end of said axle, the large elevating-wheel at the inner end thereof, the plow to throw the earth and potatoes into
25 said elevating-wheel, the horizontal rotary

separating-reel longitudinally located on said frame, the traveling apron extending from within said wheel to the induction end of said reel, and driving mechanism for the apron and
30 reel, substantially as described.

9. In combination, the main frame, the main axle longitudinally extending beneath the same, a supporting-wheel on one end of said axle, the large elevating-wheel at the other end thereof, having a driving-wheel on its outer
35 side, the plow to throw the earth and potatoes into said wheel, the apron to receive the same from the wheel, the rotary separating-reel, into which said apron delivers, a drive-shaft from
40 which said reel and apron are driven, and means for driving said shaft from the drive-wheel on the elevator-wheel, substantially as described.

In testimony that I claim the foregoing as my own I affix my signature in presence of
45 two witnesses.

CARL TONSAGER.

Witnesses:

GEORGE N. LAMPHERE,
WILLIAM R. HODGES.