

(No Model.)

2 Sheets—Sheet 1.

C. D. HARDCASTLE.

GEARING.

No. 365,993.

Patented July 5, 1887.

Fig: 1.

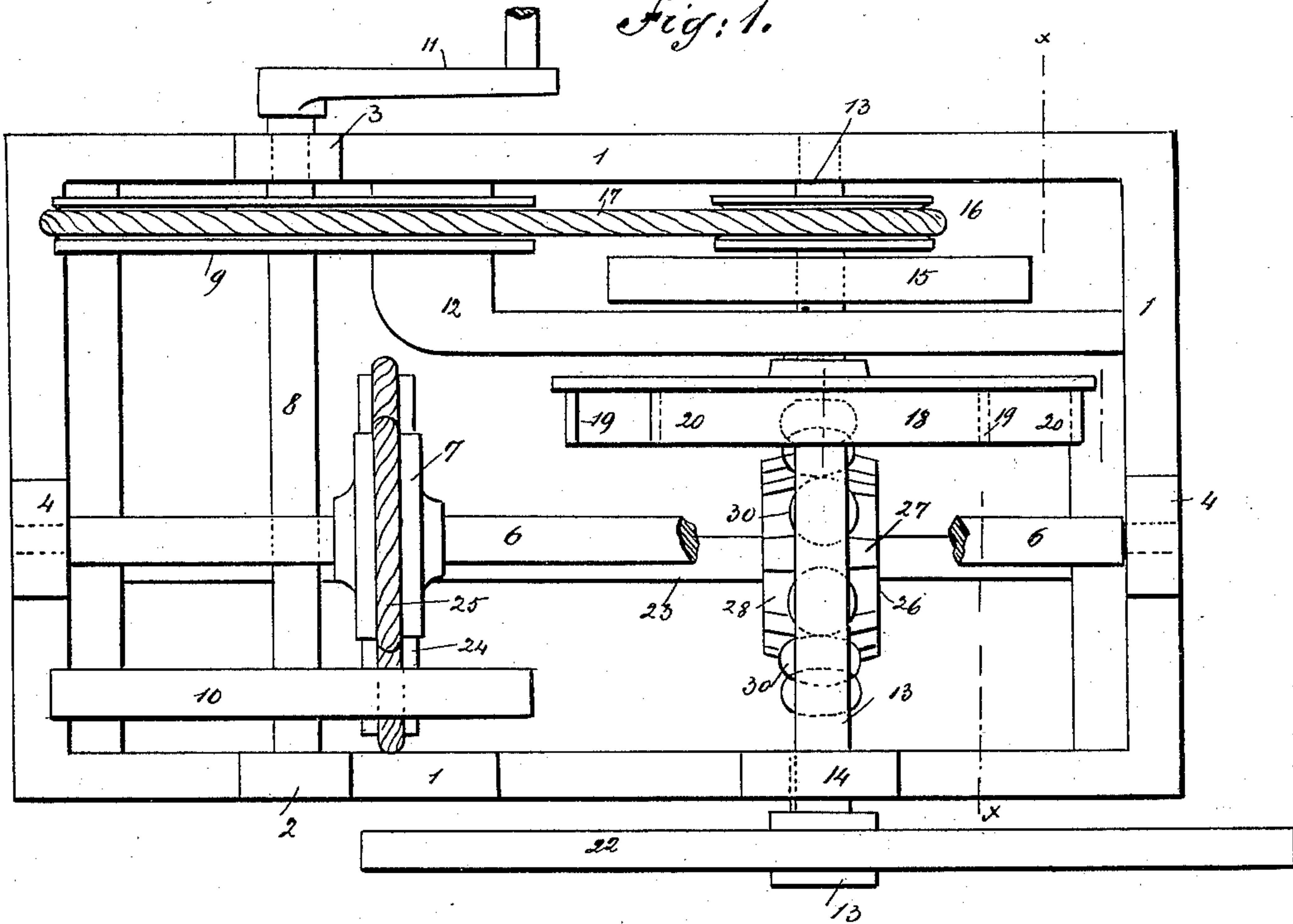
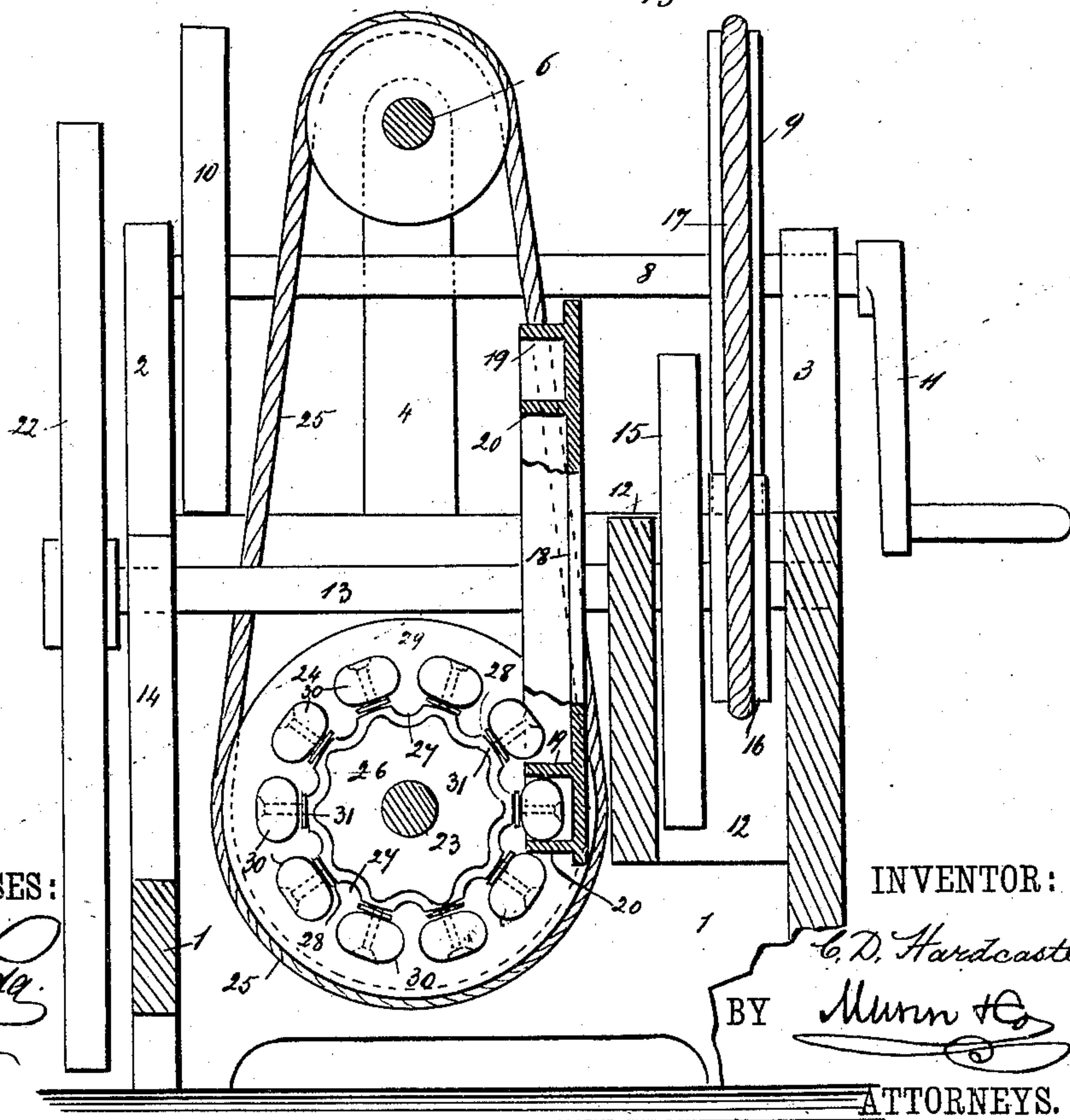


Fig: 2.



WITNESSES:

Chas. A. Nida.
C. Sedgwick

INVENTOR:

C. D. Hardcastle
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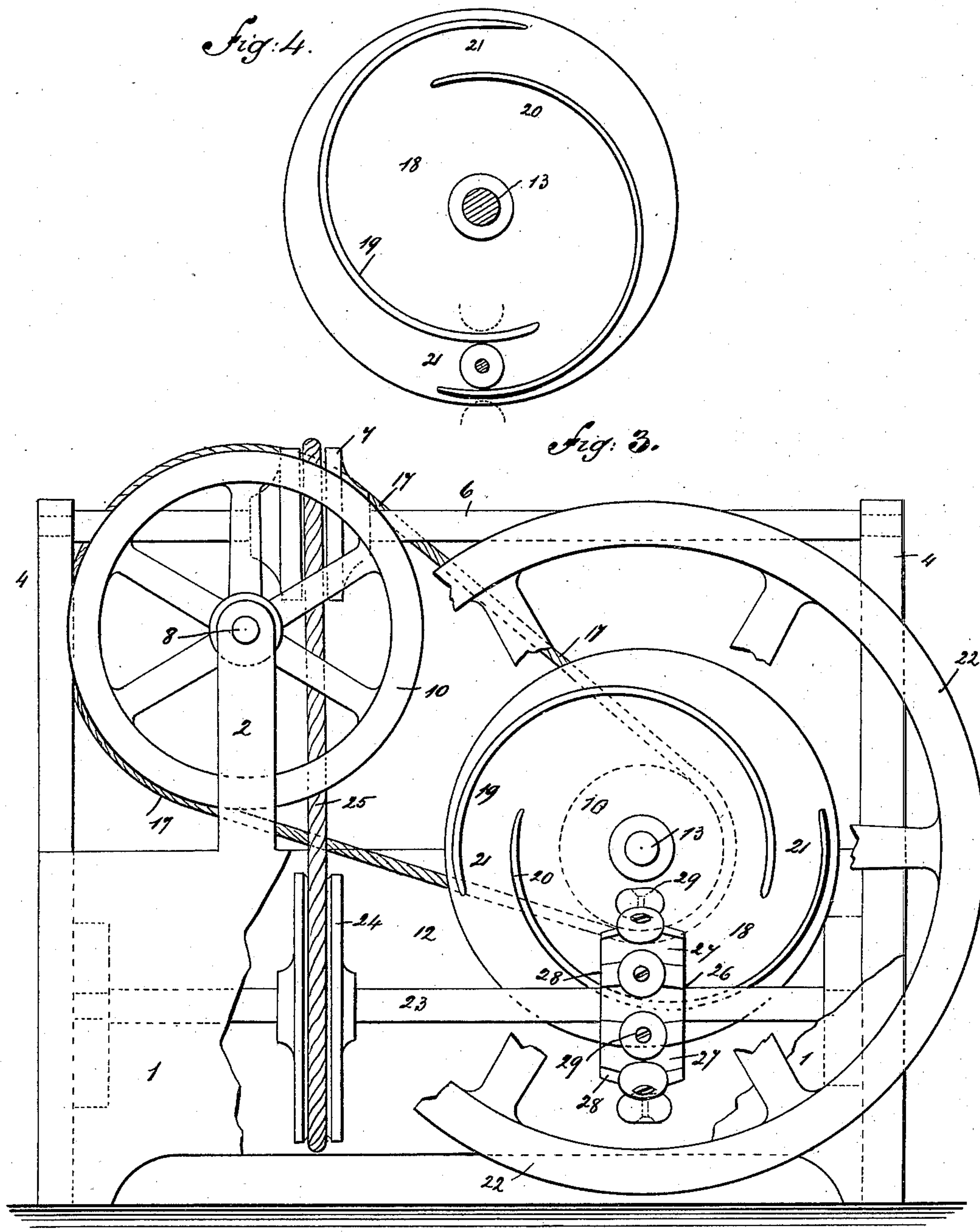
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UNITED STATES PATENT OFFICE.

COLES D. HARDCASTLE, OF NEW YORK, N. Y.

GEARING.

SPECIFICATION forming part of Letters Patent No. 365,993, dated July 5, 1887.

Application filed December 14, 1886. Serial No. 221,526. (No model.)

To all whom it may concern:

Be it known that I, COLES D. HARDCASTLE, of the city, county, and State of New York, have invented a new and useful Improvement in Gearings, of which the following is a full, clear, and exact description.

My invention relates to an improvement in gearing, and has for its object to provide a gearing wherein a maximum amount of power may be communicated with minimum exertion, and wherein but little friction is developed in the operation thereof, and wherein further, a steady and uniform movement is attained.

The invention consists in the 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 letters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of my device; Fig. 2, a transverse vertical section through line *xx* of Fig. 1. Fig. 3 is a side elevation with the fly-wheel and frame partly broken away, and Fig. 4 a front elevation of the worm-face plate with the friction-roller in engagement therewith.

Upon the shaft 13 a disk or plate, 18, is keyed, having its face provided with oppositely-arranged eccentric flanges 19 and 20, as illustrated in Fig. 4, the position of the said flanges upon the said plate being such that their ends overlap above and below the center of the plate, a space, 21, of equal width, intervening the aforesaid concentric overlapping ends. The flanges 19 and 20 may be either cast integral with the annular plate 18 or made independent thereof, and attached thereto in any suitable manner.

Upon a shaft, 23, arranged at right angles to the shaft 13, beneath and in vertical alignment with said shaft 13, a wheel, 26, is keyed, having its periphery formed with alternating concave surfaces 27 and convex or rib-like surface 28. Each rib 28 upon the wheel 26 is flattened more or less centrally to receive pins 29, which pins may consist of a screw or equivalent device adapted to carry spherical rollers 30, the heads of the pins 29 being prefer-

ably countersunk in the upper surface of the rollers, as shown in Fig. 2, and between the under surface of the roller 30 and the face of the ribs 28 a loose washer, 31, is provided to avoid friction. The purpose of the concave surfaces in the wheel 26 is to afford an uninterrupted passage of the flanges 19 and 20 and permit the said wheel 26 to be set close to the plate 18.

The rollers carried by the wheel 26, which is held at right angles to the flanged annular plate 18, are adapted as the said plate is rotated to engage the eccentric flanges 19 and 20 alternately, one roller not being released from connection with one of said flanges until the other is in proper engagement with the other, as shown in Figs. 2 and 4. Thus a continuous and smooth motion is imparted to the shaft 23.

In illustration of my invention I have shown a more or less rectangular frame, 1, having vertical upwardly-extending side standards, 2 and 3, and vertical end standards, 4, the side standards being placed opposite each other near one end, while the end standards are centrally placed in alignment the one with the other. Longitudinally with the frame within the said end standards, 4, is journaled a shaft, 6, provided near one end with a fixed pulley, 7, and transversely to the frame beneath said shaft 6 is journaled in the side standards, 2 and 3, a shaft, 8, having keyed thereon at one end within the frame a pulley, 9, and at the other end, also within the frame, a balance-wheel, 10. The shaft 8 is provided with a crank-arm, 11, at one end, whereby motion can be imparted thereto. At the end of the frame opposite to that near which the side standards, 2 and 3, are located, and to the rear side of the frame 1, a bracket, 12, is attached to said side and end. In the bracket 12 and in the rear side of the frame one end of the shaft 13 is journaled, the other end being journaled in a standard, 14, secured to the opposite side. Upon the said shaft 13, between the bracket 12 and side of the frame, a balance-wheel, 15, is keyed, and next to said balance-wheel, upon the rear side thereof, a small pulley, 16, is keyed, the said pulley being connected by a belt, 17, with the large pulley 9 upon the drive-shaft 8. A fly-wheel, 22, is keyed upon the extremity of the main shaft 13, which projects beyond its bear-

ing in the standard 14. Longitudinally with the frame the shaft 23 is journaled, having keyed thereon in alignment with the pulley 7 upon the upper longitudinal shaft, 6, a large pulley, 24, the two pulleys 24 and 7 being connected by a belt, 25.

The rotation of the shaft 13 through the gearing 18 21 imparts motion in the shaft 23, which in turn imparts motion through the connection above described to the upper longitudinal line of shafting 6, from which power may be taken as desired, and as the shaft 13 is also revolved power may readily be taken from the fly-wheel 22, keyed thereon, if found desirable.

There being little friction in my system of gearing or transferring motion, but slight exertion is necessary upon the crank to revolve the drive-shaft. It will be readily observed that if my gearing be properly constructed and arranged there will be no cessation or irregularity of motion imparted during the operation of the device.

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

1. The gearing herein described, compris-

ing the frame, the upper and lower vertically-aligned horizontal shafts, 6 23, the vertical wheel 26, and pulley 24 on the shaft, the rollers 30 on the periphery of the vertical wheel 26, the vertical pulley 7 on shaft 6, the belt 25, connecting the pulleys 7 24, the horizontal shaft 13 at right angles to shafts 6 23, and having a vertical plate, 18, provided with oppositely-arranged eccentric-spaced flanges 19 20, engaging the rollers 30, the pulley 16 on shaft 13, the horizontal shaft 8, parallel with shaft 13, and having a pulley, 9, belted to the pulley 16, substantially as set forth.

2. The horizontal shaft 23, the vertical wheel 26, having a ribbed or corrugated periphery, the ends of the ribs being flattened, the spherical rollers 30, and the pins 29, in combination with the horizontal shaft 13, at right angles to shaft 23, and having a vertical plate, 18, at right angles to the ribbed wheel, and provided with the two spaced eccentric overlapping flanges 19 and 20, substantially as set forth.

COLES D. HARDCASTLE.

Witnesses:

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