

(No Model.)

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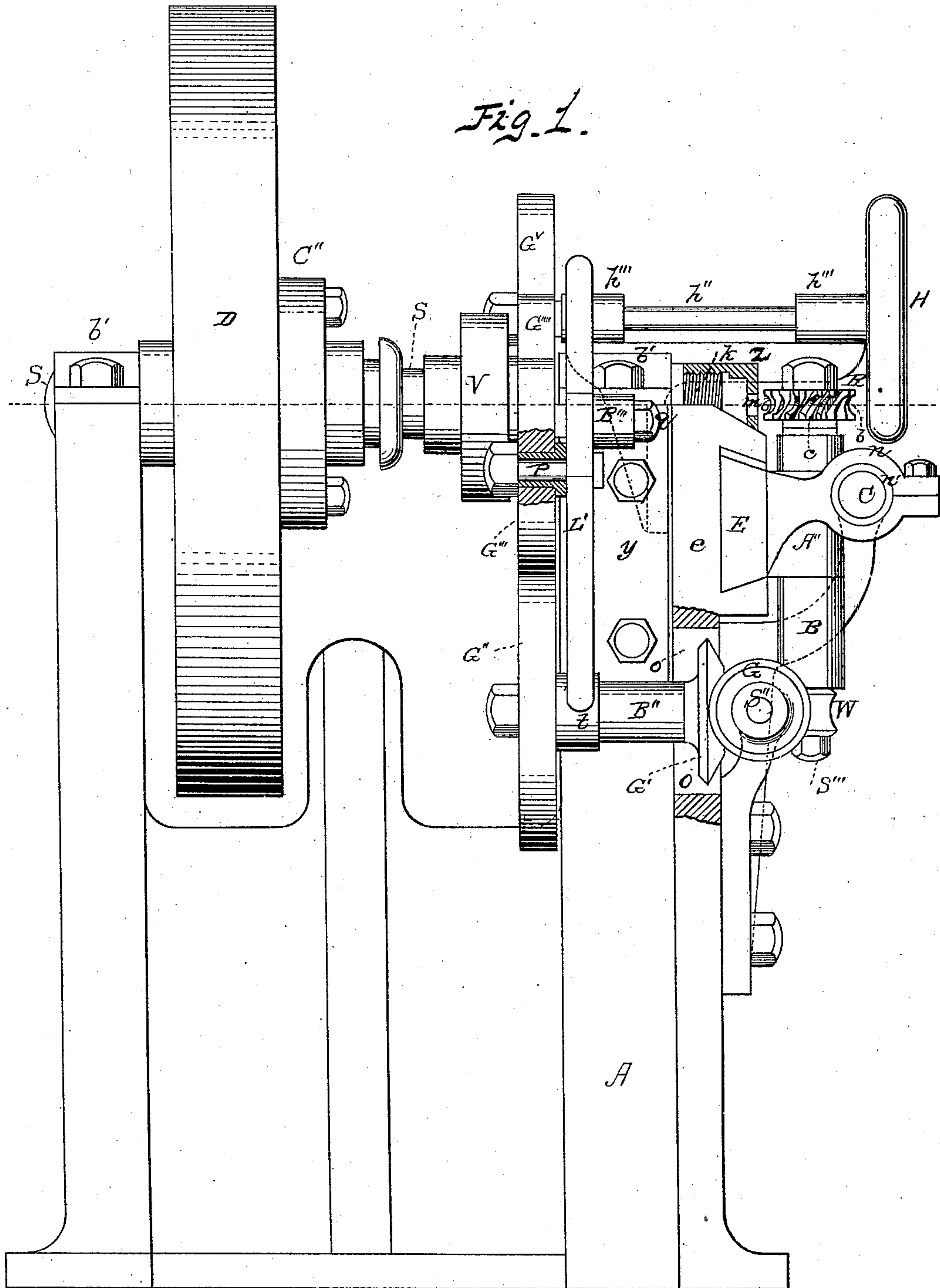
F. A. SNELL.

MACHINE FOR TWISTING AUGERS.

No. 257,399.

Patented May 2, 1882.

Fig. 1.



WITNESSES

Willet Anderson
Philip C. Massi

INVENTOR

Fred A. Snell,
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(No Model.)

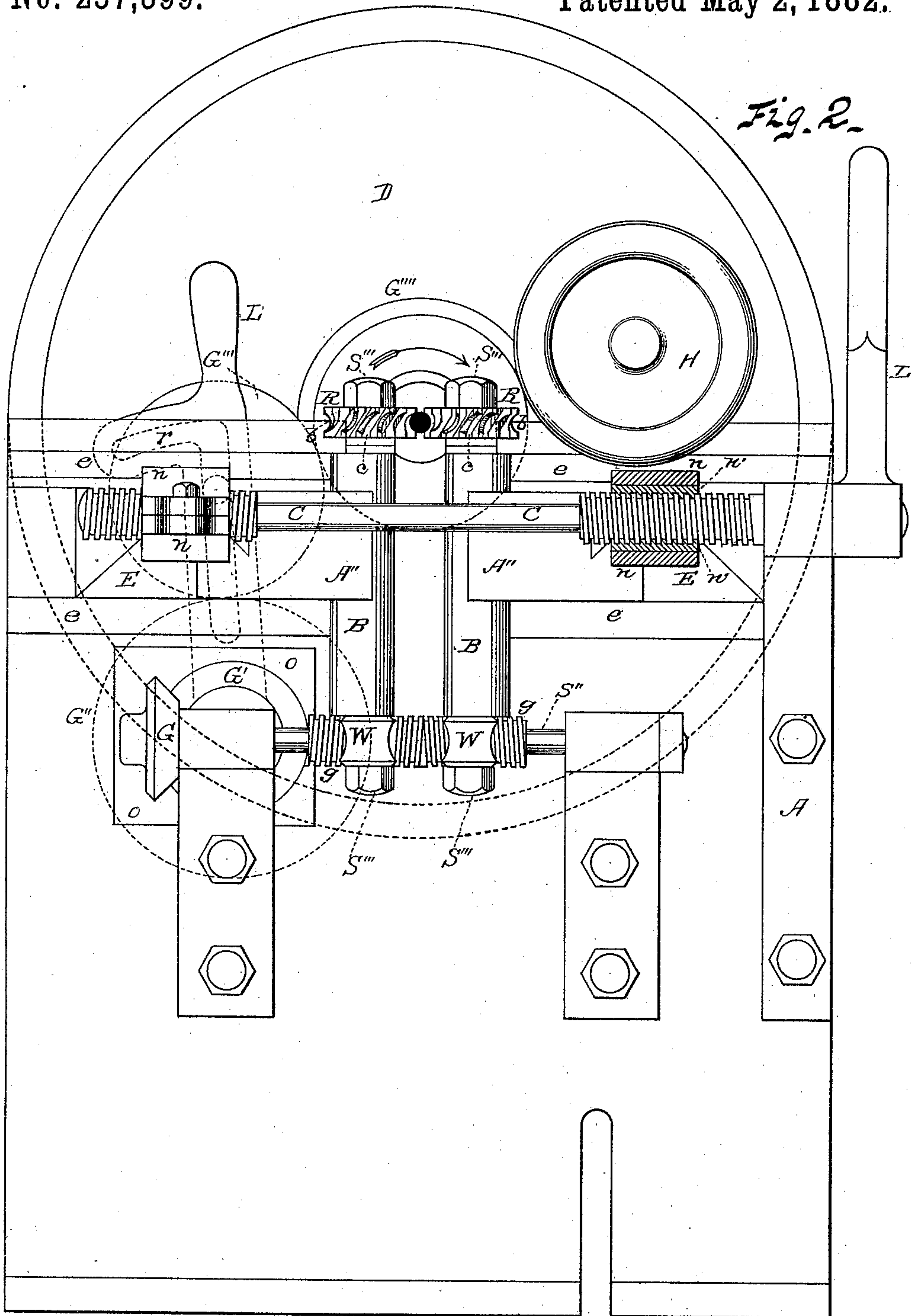
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F. A. SNELL.

MACHINE FOR TWISTING AUGERS.

No. 257,399.

Patented May 2, 1882.



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(No Model.)

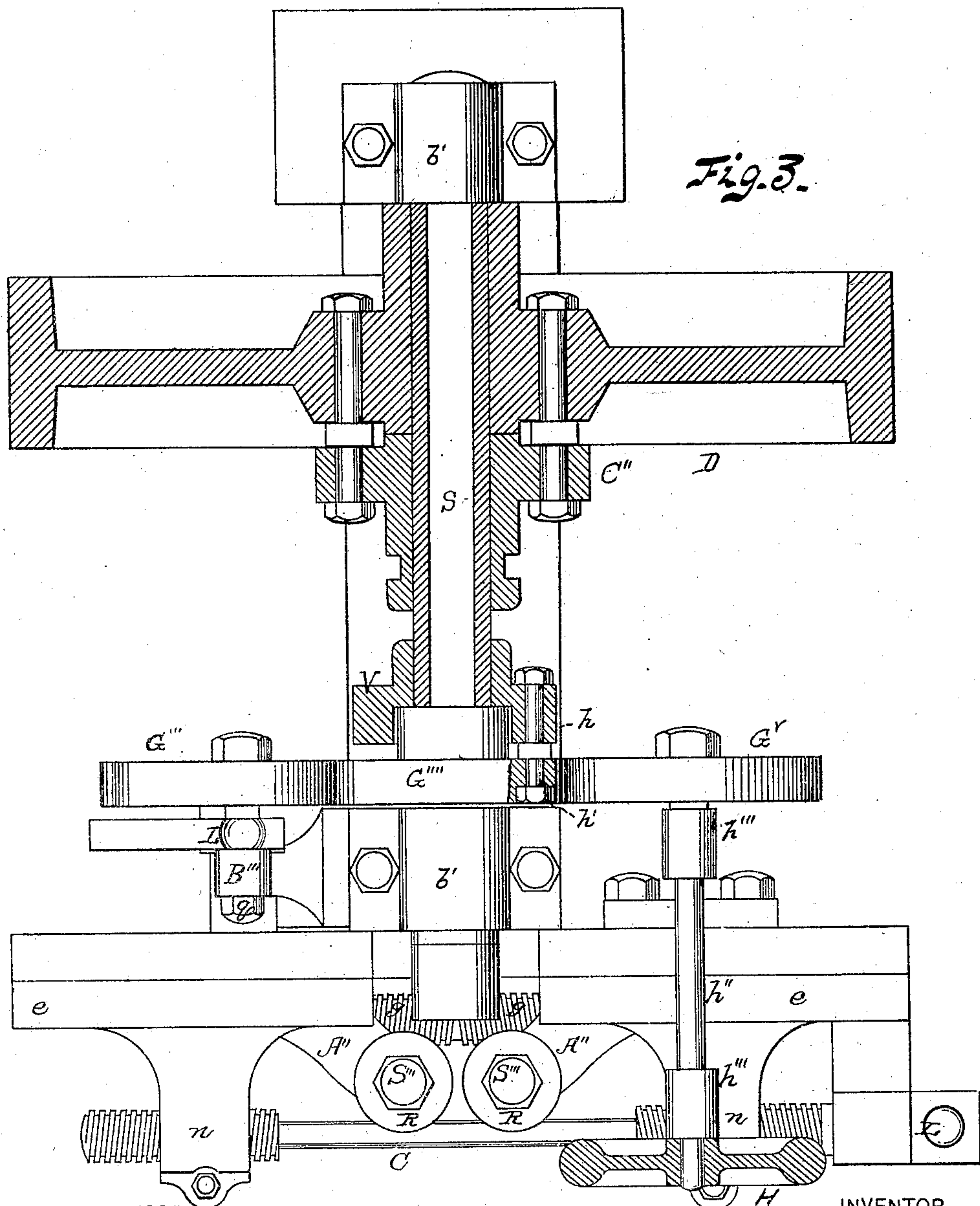
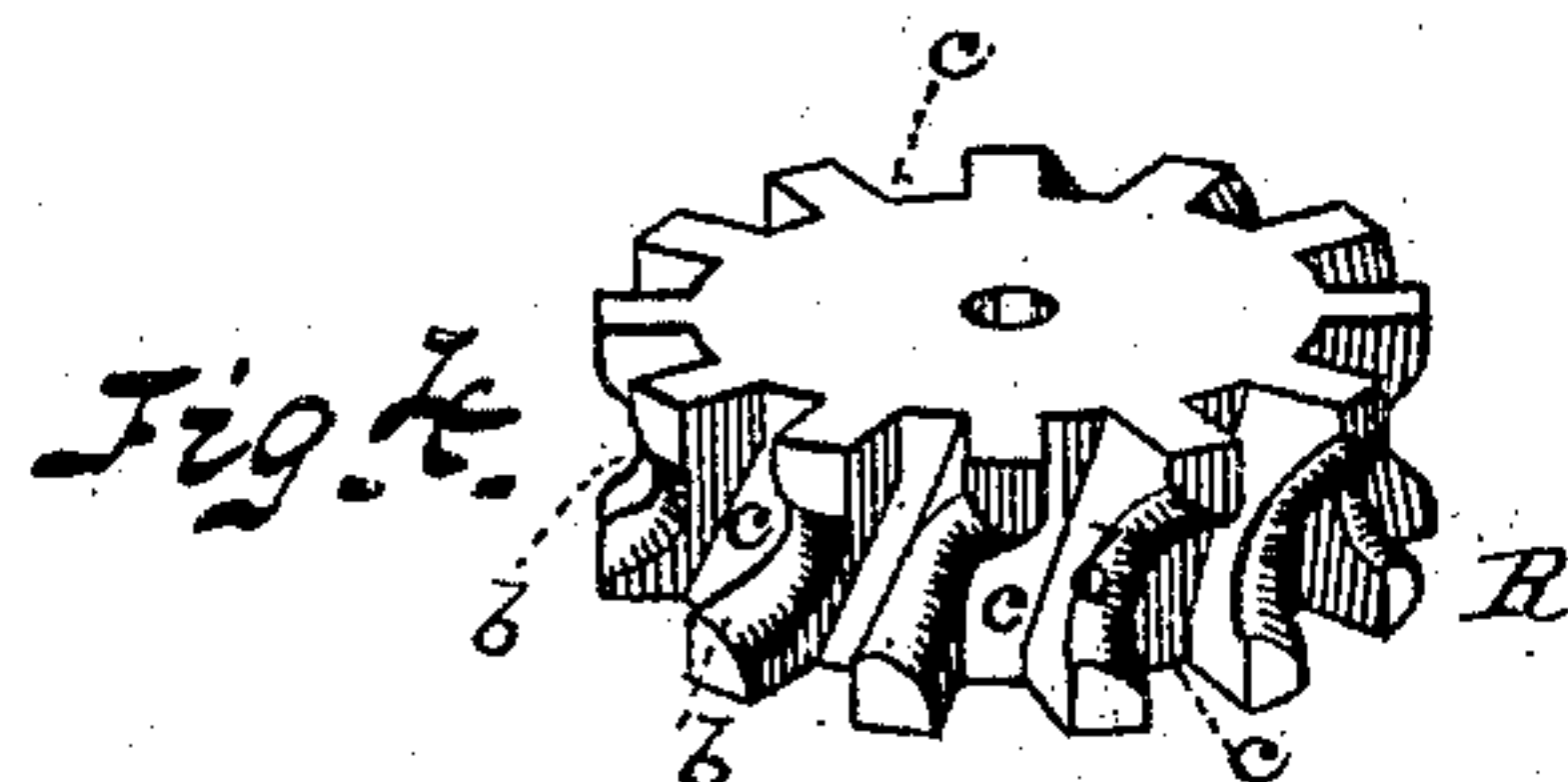
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F. A. SNELL.

MACHINE FOR TWISTING AUGERS.

No. 257,399.

Patented May 2, 1882.



WITNESSES

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UNITED STATES PATENT OFFICE.

FRED A. SNELL, OF FISKDALE, MASSACHUSETTS.

MACHINE FOR TWISTING AUGERS.

SPECIFICATION forming part of Letters Patent No. 257,399, dated May 2, 1882.

Application filed February 9, 1882. (No model.)

To all whom it may concern:

Be it known that I, FRED A. SNELL, a citizen of the United States, resident of Fiskdale, in the county of Worcester and State of Massachusetts, have invented a new and valuable Improvement in Machines for Twisting Augers and Auger-Bits; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a side view of my improved twisting-machine. Fig. 2 is a front or face view of the same. Fig. 3 is a horizontal sectional view, and Fig. 4 is a perspective view of one of the rolls.

This invention has relation to means for twisting augers and bits; and it consists in the construction and novel arrangement of the peripheral bit-hollow matrices of the feeding-rolls; of the bearing-slides, nuts, and right-and-left worm for opening and closing the same; of the hollow-bit-holding shaft and its removable thimble, having a rectangular aperture for the bit-plate; of the gearing connecting the shafts of the rolls and the hollow-bit-holding shaft; and of the slotted gear-bearing lever, all as hereinafter set forth.

This machine is designed for twisting augers or bits, but does not form the head or cutting portion. That portion of a bit or auger which is to be twisted is first forged in flat form with parallel sides, and in this form is called a "plate." By the mechanism hereinafter described the plate, having been first inserted into the rotary hollow shaft, is drawn therefrom as fast as twisted by means of the feeding-rolls, as hereinafter explained.

In the accompanying drawings, the letter A designates the main casting or bed of the machine.

R R indicate the feeding-rolls, mounted on the parallel shafts S''' S''', which are seated in the bearings B B, carried on the ends of arms A'' A''. The feeding-rolls are cylinders of short axial length, and in their peripheries are formed the matrices *b* of the hollow or concave portion of a bit or auger. These rolls are usually produced in the following manner:

A pattern is first prepared by burning into the periphery of a simple wooden cylinder of the required length and diameter a number of matrices of its hollows and edges by means of a red-hot bit or auger twist. Having thus obtained a pattern, a casting is procured therefrom; but before using the same, in order to render the roll complete and perfect in its action, it is proper to cut away the stock or iron which constitutes the matrices of the edges of the bit or auger, thereby leaving oblique grooves or intervals *c* between the matrices *b* of the hollows, so that when the twisted bit or auger is rolled between two of these rolls the edges of the bit will not bear on the iron, but will be left free, thus rendering it doubly sure that the hollows will bear on their respective matrices *b*. These rolls are designed to effect several important purposes in the operation of the machine: first, to prevent from revolving with the hollow shaft that portion of the bit or auger plate which remains outside of it, being the portion which lies between the thimble-aperture and the rolls; secondly, to draw the bit or auger shaft away from the hollow shaft exactly and equally as fast as the plate is twisted by said shaft; and, thirdly, to serve as a pair of crimp-dies to make true and uniform the twist of the bit or auger.

E E indicate slides seated in bearings *e* on each side of the bed, and carrying each an arm, A'', and bearing B, for the shaft of a roll. Each slide also carries a box, *n*, holding a nut, *n'*, through which passes a branch of the right-and-left worm C, which is operated by the lever L. The slide E is designed to be cast with the box *n*, bearing B, and arm A'', entire in solid form, so that any motion of the slide will cause movement in the roll connected thereto. Therefore when the right-and-left worm C is operated the rolls are caused to approximate or recede from each other.

In order to turn the rolls the following mechanism is to be employed. Worm-gears W are rigidly fastened to the lower ends of the shafts S''', and are operated by right-and-left worms *g g* on a shaft, S'', which is provided with a bevel-gear, G, to which motion is transmitted from the main shaft S by means of a train of wheels, G' G'' G''' G''', the latter being carried on the main shaft. The gear G'''' is loose on the main shaft, and is driven by the collar V, which is

tight on the shaft, and is provided with a projecting bolt-head, h , which is designed to engage a projection, h' , on the gear. This construction is adopted in order to enable the main shaft to be revolved through nearly one complete revolution before transmitting circular motion to the rolls.

S represents the main shaft, which runs in bearings $b' b'$, and is made hollow to receive the plate of a bit or auger. The shaft is driven by means of the large pulley D , which is loose on said shaft, but engages a clutch-collar, C'' , moving on a spline on the shaft. On the front end of the shaft a left-hand thread, k , is cut to receive a thimble, Z , the end of which is provided with a rectangular aperture, m , of proper size to permit the introduction of a bit or auger plate into the hollow or chamber of the shaft S . Now, if a bit or auger plate is introduced between the rolls into this aperture until the shank of the bit touches the rolls, and the rolls are closed, the bit-plate is in position ready for twisting. The machine being started, the main shaft S makes nearly a revolution, as stated above, before giving motion to the rolls, thereby twisting about two hollows of the plate, and fitting it to enter the rolls. These now begin to revolve and draw the plate out of the aperture m exactly and equally as fast as the hollow shaft performs the twisting. For bits of different size different sets of rolls must be employed in the machine, and the gear G'' must be changed so that the rolls shall draw out the bit at the exact speed required to give the necessary pitch to the twist of the bit. Gears G'' having different numbers of teeth are provided, and the method of changing the wheels is like that employed in engine-lathes for cutting screws. The intermediate gear-wheel, G''' , running on stud P , is first removed. The proper gear G'' is then put in place. The intermediate gear is then replaced on the stud P , which moves in a slot, r , in the lever L' , and is adjusted to mesh with the wheel G'' . The lever L' , which is fulcrumed on the center bearing, t , of the wheel G'' , is then moved until the wheel G''' also meshes with the wheel G''' of the main shaft. The lever is then secured by means of a bolt, q , to the arm B''' of the bed, said bolt being adjustable in a curved slot, r , in the lever.

H represents a hand-wheel, by which motion may be transmitted through the gear-wheels G^v and G''' to the main shaft. The operator is thus enabled to set the main shaft in the right position to receive the bit-plate. The hand-wheel shaft h'' is supported in bearings h''' . An opening, o , is made through the main bed or casting in front to admit the gear G' .

y indicates the casting which supports the box B'' and the arm B''' . It is bolted to the main pillar of the bed. The clutch C'' is operated in stopping and starting the machine by means of a suitable lever. The main shaft is at right angles to the plane of the axes of the rolls, its axis extending centrally between the rolls and lying in a horizontal plane bisecting the same.

Having described this invention, what I claim, and desire to secure by Letters Patent, is—

1. The rolls $R R$, having formed in their peripheries the matrices b of a bit or auger hollow or concave, substantially as specified.

2. The combination, with a pair of rolls having peripheral bit or auger hollow matrices, and a hollow rotating shaft extending at right angles to the plane of the axes of said rolls, of connecting-gear operating said rolls and said shaft at the same time, substantially as specified.

3. The combination, with the rolls R and their shafts, the slides E , having bearings B , and box-nuts $n' n'$, of the right-and-left worm C , and mechanism for turning the same, as specified.

4. The combination, with a pair of hollow matrix rolls and the shafts $S''' S'''$, on which they are seated, of the hollow rotary bit-holding shaft, its thimble having a rectangular aperture, and mechanism, substantially as described, connecting the shafts $S''' S'''$, as specified.

5. The combination, with the rolls R , their bearing-slides E , nuts n' , and right-and-left worms $C g$, of the hollow shaft S , loose pulley D , clutch C'' , collar and gearing $W G G' G'' G''' G'''$, substantially as specified.

6. The combination, with the rolls R , their bearing-slides E , nuts n' , and right-and-left worms $C g$, of the hollow shaft S , loose pulley D , clutch C'' , collar V , gearing $W G G' G'' G''' G'''$, and slotted lever L' , substantially as specified.

7. The combination, with the rolls, their bearing-slides E , nuts n' , right-and-left worms $C g$, and the hollow shaft S , loose pulley D , clutch C'' , and collar V , of the connecting-gear, the hand-wheel H , its shaft h'' , and gear-wheel G^v , substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

FRED A. SNELL.

Witnesses:

MILTON P. HIGGINS,
E. T. SCOTT.