No. 625,811. Patented May 30, 1899.

W. H. H. SISUM, Dec'd.

J. WILKINSON, Administrator.

SPINNING JENNY.

(Application filed Nov. 6, 1894. Renewed Oct. 2, 1897.)

(No Model.) 2 Sheets—Sheet 1.

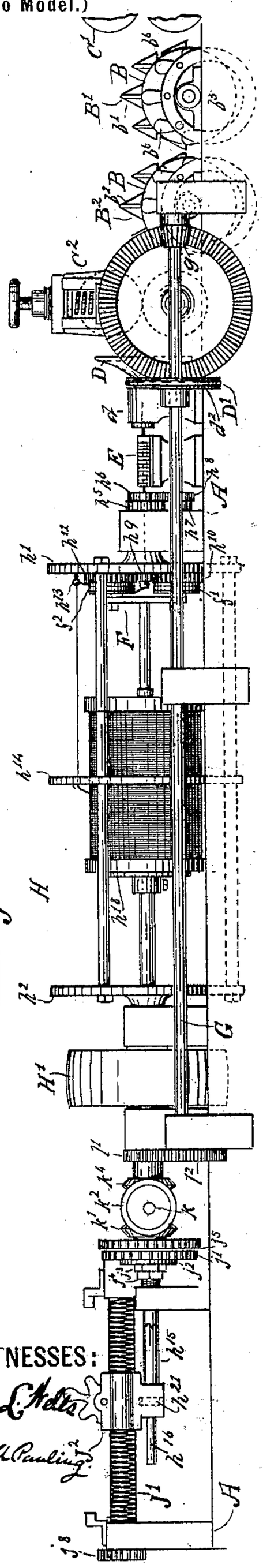

Fig. 1.

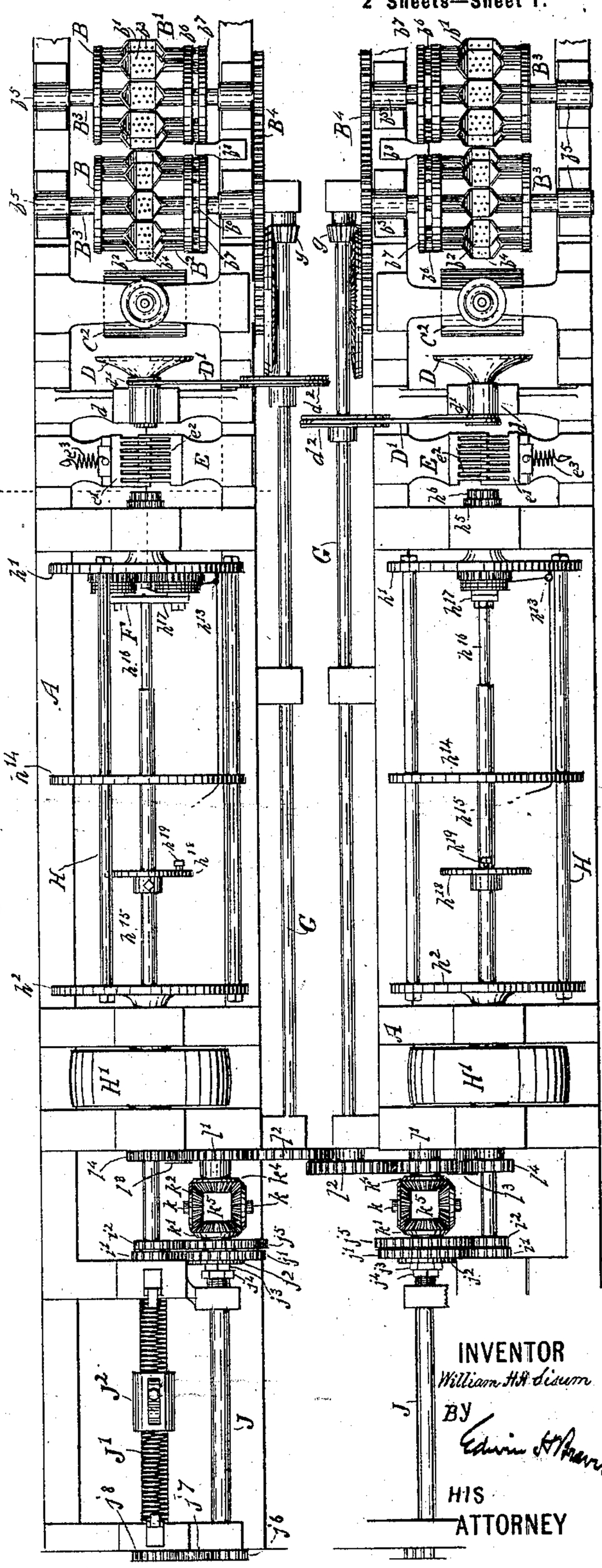

Fig. 2.

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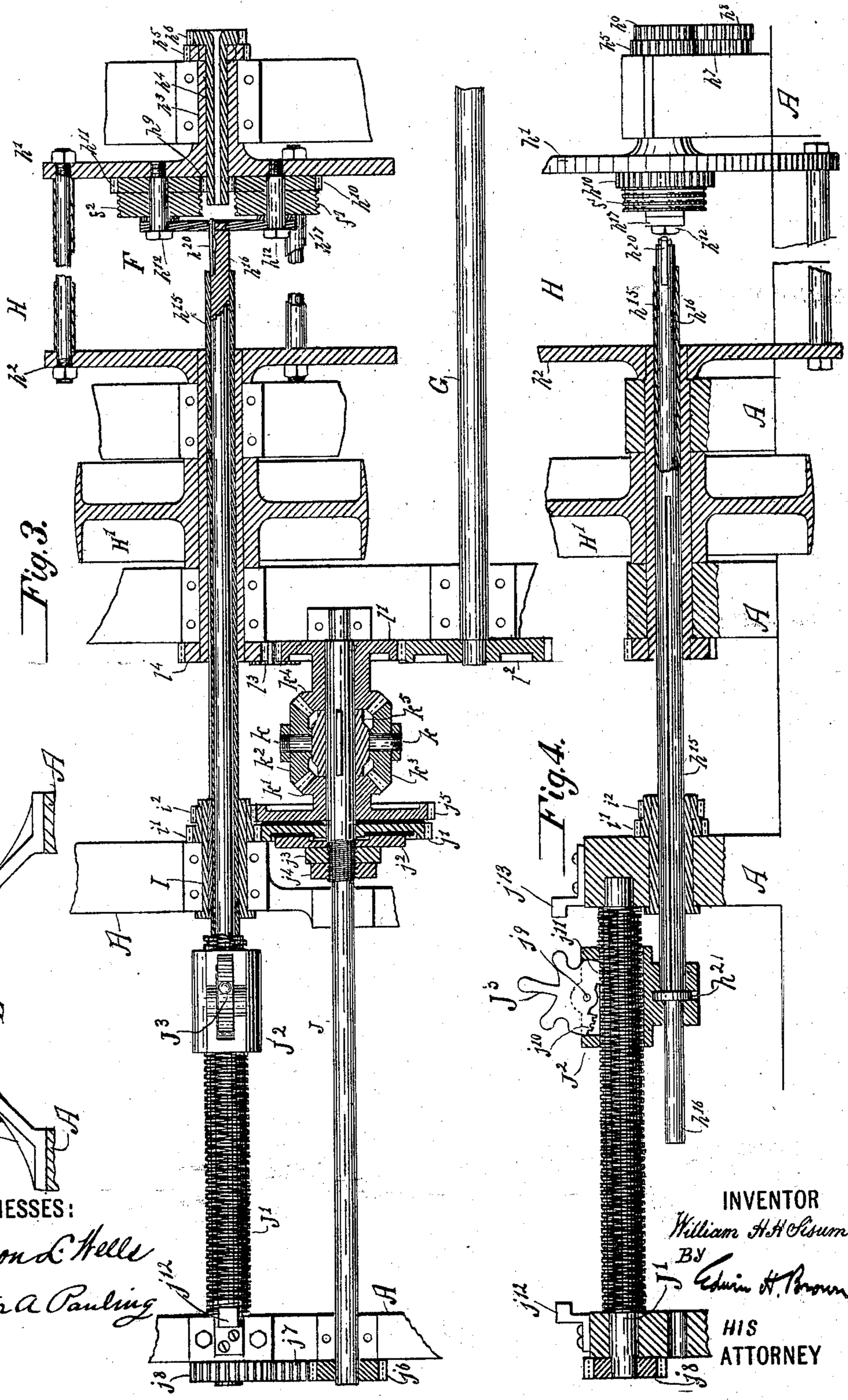

UNITED STATES PATENT OFFICE.

WILLIAM H. H. SISUM, OF BELLEVILLE, NEW JERSEY; JOSEPH WILKINSON ADMINISTRATOR OF SAID SISUM, DECEASED.

SPINNING-JENNY.

SPECIFICATION forming part of Letters Patent No. 625,811, dated May 30, 1899.

Application filed November 6, 1894. Renewed October 2, 1897. Serial No. 654,201. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. H. SISUM, of Belleville, in the county of Essex and State of New Jersey, have invented a certain new and useful Improvement in Spinning-Jennies, of which the following is a specification.

I will describe a jenny embodying my improvement and then point out the novel features in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a machine embodying my improvement. Fig. 2 is a plan or top view of the same. Fig. 3 is partly a plan and partly a horizontal section of certain parts on an enlarged scale. Fig. 4 is partly a side view and partly a vertical longitudinal section of parts shown in Fig. 3. Fig. 5 is a transverse section taken at the plane of the dotted line 5 in Fig. 2.

Similar letters of reference designate corresponding parts in all the figures.

A designates the framework of the machine. It may be of any suitable construction. Essentially it will consist of two side frames united by cross-pieces or stretchers.

B′ B² designate two series of circularly-arranged rods journaled in revolving heads B and severally provided with rests b' b^2 for supporting fibrous material and with heckling-pins b^3 b^4 to comb or draw out such material. The heads B are affixed to shafts B^3, journaled in bearings b^5, mounted upon the side pieces of the framework A. At one end the rods B′ B² are provided with cranks b^6, whose outer ends are engaged with holes in rings b^7, that are held in position within the framework A so as to be incapable of bodily movement, although free to rotate. Stops b^8 will suffice to secure the rings in position, and these stops may be conveniently secured to one of the side pieces of the framework A. By thus combining the rods and their cranks with the rotary but bodily immovable rings the heckling-pins will be maintained in vertical positions while they revolve about the axes of the shafts B^3.

The rests b' b^2 have plate-like portions formed integral with or attached to the rods B′ B² and end portions inclined upwardly, so as to diverge from each other, the construction as a whole being trough-shaped. The heckling-pins extend upwardly from the plate-like or body portions of the rests, and they may be of the usual or any suitable form.

The two sets of rods B′ B² are intended to be revolved at different speeds, the second set having more rapid movement than the first.

There may be any desired number of sets of the rods, rests, and heckling-pins, and no matter how many may be used they will preferably each travel successively faster throughout the series.

With the revolving rods, rests, and heckling-pins are combined pairs of rollers. In the present instance I have only shown two pairs of rollers C′ C², and these are located one pair behind and the other pair in advance of the two sets of rods B′ B² and their appurtenances. The pair of rollers C′ are intended to rotate less rapidly than the speed of the heckling-pins belonging to the first set of rods B′, and the pair of rollers C² are intended to rotate more rapidly than the movement of the second set of heckling-pins belonging to the rods B².

Any suitable gearing B⁴ will serve to effect the proper relative motions of the heckling-pins and rollers. From the pair of rollers C² the fibrous material is delivered to a roving-tube D, having a funnel-shaped mouth. Thence it passes to a device E, which I term a "nibbler," whose function is to reduce the roving to a standard size. From the nibbler the roving passes to a capstan F, which draws it along and delivers it to the jenny proper.

The roving-tube D is journaled in a bearing d, located upon one of the cross-pieces of the framework A, and is rotated by means of a belt D′, applied to a pulley d', which is affixed to the roving-tube. The belt D′ passes around a large pulley d^2, affixed to a shaft G, which, as here shown, serves to drive the gearing B⁴ through the agency of a pinion g, engaging with a large beveled gear-wheel fixed to rotate with one of the gear-wheels in the train of gearing B⁴.

The nibbler E consists of two pieces severally provided with a number of fingers e' e^2, which are spaced so that those of each set

project into the spaces between those of the other set. These fingers are made square in the cross-section, so as to fit snugly side to side, and have hooked ends. Provision is afforded for a relative movement. In the present instance this is done by making one piece of the nibbler a fixture and so fitting the other piece as to enable it to have a sliding movement, a spring e^3 being employed to pull it outward. Obviously both parts could be made to slide under the influence of springs, if desired. The relative movement is in any case to be such that the hooked ends of the fingers will move toward each other, so as to embrace and tightly hug the roving passing between them.

The capstan F, as here shown, is comprised in the jenny H in the sense that its parts are attached to one of two heads h' h^2 forming part of the jenny-frame. The head h' of the jenny-frame to which the parts of the capstan are attached is provided with a tubular journal h^3, that extends into the bearing formed in one of the cross-pieces of the framework A. Within this tubular journal is a bushing h^4, the latter being free to turn independently. The outer end of the journal h^3 is provided with a pinion h^5, and the bushing h^4 is provided with a pinion h^6, the latter being shown as smaller in diameter than the pinion h^5. The pinion h^5, attached to the journal of the jenny-frame, engages with a pinion h^7 of smaller diameter fitted to turn upon a stud extending from that cross-piece of the framework A in which the bearing of the journal h^3 is formed. Affixed to this pinion h^7 is a pinion h^8, which of course turns with the pinion h^7 upon the said stud. It is of larger diameter than the pinion h^7, and it engages with the pinion h^6. The rotary motion of the jenny-frame therefore imparts a different motion through the agency of these pinions h^5, h^6, h^7, and h^8 to the bushing h^4. Inside the jenny-frame the bushing h^4 is provided with a pinion h^9, and the latter engages with gear-wheels h^{10} h^{11}, mounted to turn upon studs or pins h^{12}, which are affixed to the head h' of the jenny-frame. Affixed to the gear-wheels h^{10} h^{11} are circumferentially-grooved capstan-wheels f' f^2. These wheels are of course driven through the pinions h^5, h^6, h^7, and h^8 from the rotary motion of the jenny-frame.

The roving passes through the bushing h^4 and thence is passed around the peripheries of the capstan-wheels f' f^2, and thence it passes to an eye h^{13}, fastened to the head h' of the jenny-frame. From this eye h^{13} the roving passes to a ring h^{14}, comprised in the jenny-frame and arranged intermediately of the heads h' h^2. After passing through a hole in this ring the roving passes around a spool or bobbin arranged within the jenny-frame.

It will doubtless have been understood that the jenny-frame consists, essentially, of the two heads h' h^2, the ring h^{14}, and connecting-pieces. These connecting-pieces may advantageously consist of rods extending from one head to the other and through the ring, tubular spacing-pieces being fitted to the rods between each of the heads and the ring. The head h^2 of the jenny-frame is provided with a journal that is supported in bearings formed in cross-pieces or stretchers of the framework A.

The spool or bobbin has a central hole, by means of which it may be mounted upon a tubular shaft h^{15}, which extends through the journal of the head h^2 of the jenny-frame, but so as to be capable of independent rotation. This tubular shaft passes into a tubular shaft I, and this shaft I contributes to its support by being journaled in one of the cross-pieces of the framework A.

Within the tubular shaft h^{15} is a supporting-shaft h^{16}, which at the inner end is extended into and interlocked with a bar h^{17}, fastened to the two studs upon which the gear-wheels h^{10} h^{11} and the capstan-wheels f' f^2 turn. On the tubular shaft h^{15} is a collar h^{18}, against which one end of the spool or bobbin bears, a catch h^{19} being fastened to this collar to engage with the adjacent side of the spool or bobbin. The roving is laid onto the spool or bobbin from the ring h^{14} and the spool or bobbin is reciprocated lengthwise, so that the roving will be laid on in courses or layers from one end to the other. To effect this operation, the tubular shaft h^{15} is reciprocated longitudinally.

The shaft h^{16} is at that end which engages with the bar provided with a spring-catch h^{20}. By disengaging this spring-catch from the bar the shaft h^{16} is freed, so that it may be moved longitudinally to facilitate the removal and substitution of spools or bobbins. This movement of the shaft h^{16} should be made while the tubular shaft h^{15} has made its extreme movement away from the head h' of the jenny-frame.

The jenny-frame may be rotated in any suitable manner—as, for instance, by a pulley H', affixed to the journal of the head h^2.

The tubular shaft h^{15} is engaged with the tubular shaft I by means of a spline or feather, so that said tubular shaft h^{15} may be moved longitudinally without any corresponding movement of the tubular shaft I, and yet the two shafts will be interlocked so far as rotary movement is concerned.

The tubular shaft I is provided with two pinions i' i^2. The pinion i' engages with a spur-gear j', which is loosely mounted upon a shaft J, that is journaled in bearings formed in cross-pieces of the framework A. This gear-wheel j' is combined with the shaft J by means of a friction device, here shown as consisting of a disk j^2, arranged opposite the gear-wheel j', and two nuts j^3 j^4, engaging with a screw-thread upon said shaft J beyond the disk j^2. Intermediately of the disk j^2 and the gear-wheel j' is a ring or washer of friction-producing material, such as leather. This connection of the gear-wheel j' with the shaft J provides for slippage between it and said

shaft. The pinion i^2 is smaller than the pinion i' and engages with a spur-gear j^5, that is loosely mounted upon the shaft J. Of course this gear-wheel j^5 is larger than the gear-wheel j'.

With the gear-wheel j^5 is combined a beveled gear-wheel k', the latter preferably being formed integral with it. This beveled gear-wheel k' engages with two beveled gear-wheels k^2 k^3 of the same size journaled upon studs k, that are carried by a cross bar or head k^5, affixed to the shaft J. The beveled gear-wheels k^2 k^3 therefore revolve with the rotation of the shaft J and are free to rotate upon their own axes. They not only engage with the beveled gear-wheel k', but also with a beveled gear-wheel k^4, which is formed integral with the sleeve or tubular shaft that is mounted loosely upon the shaft J. The beveled gear-wheel k^4 is provided with a gear-wheel l'. The latter may, if desired, be formed integral with it. This gear-wheel l' engages with a gear-wheel l^2, affixed to the shaft G, formerly mentioned as imparting motion to the gearing driving the heckling-pins and rollers. The gear-wheel l' also engages with a pinion l^3, mounted upon a stud extending from one of the cross-pieces of the framework A, and the latter engages with a pinion l^4, that is affixed to the journal projecting from the head h^2 of the jenny-frame. Owing to this combination of gearing, motion is imparted to the beveled gear-wheel k^4 directly from the jenny-frame, and motion is imparted to the gear-wheel k' directly from the spool or bobbin through the agency of the tubular shaft h^{15}. Motion may also be imparted to the gear-wheels k^2 k^3 by the shaft J from the tubular shaft h^{15}, the latter motion being slightly more rapid than the motion imparted from the tubular shaft h^{15} to the beveled gear-wheel k' and the wheel j', as before mentioned, being simply subject to slippage relatively to the shaft J.

The capstan F insures the delivery of the roving into the jenny proper at a uniform rate of speed. Owing to the gear-wheels h^5, h^6, h^7, and h^8, the capstan-wheels will deliver the roving at a slightly-slower speed than the speed of that point in the ring h^{14} or the jenny-frame whence the roving is delivered to the spool or bobbin. Owing to the fact that the accumulation of the courses or layers of the roving upon the spool or bobbin varies the diameter of the latter at the point where the roving is delivered, the speed of the bobbin derived from the pull of the roving must vary. This is provided for by the combination of beveled gear-wheels and the other parts described as coöperating therewith. The bobbin derives no rotary motion except that which it receives from the pull exerted upon it through the roving. The bobbin imparts motion to the pinions i' i^2, and the latter impart motion to the two gear-wheels j' j^5. These gear-wheels of course rotate at different speeds by reason of the fact that they differ in diameter, and the pinions i' i^2 similarly differ. The said gear-wheels j' j^5 are frictionally engaged by means of an intermediate disk of leather or other suitable material, as already described, and the gear-wheel j' is frictionally clutched to the shaft J through the disk j^2 and the parts coacting with the latter. The reason why I use the two pinions i' i^2 and the two gear-wheels j' j^5 is to retard the beveled gear-wheel k', so that the roving will pull it and thus cause the roving to be wound tightly upon the bobbin.

The shaft J has affixed to one end a gear-wheel j^6, and this engages with a gear-wheel j^7, affixed to a stud on the framework A of the machine. The gear-wheel j^7 engages with a gear-wheel j^8, affixed to a shaft J', which is journaled in the framework A of the machine. This shaft J' has right and left intersecting screw-threads throughout its entire length except at its extremities, where it is journaled in place. Surrounding this shaft is a sleeve J^2, that is provided with a double nut-segment J^3, made in the form of a lever, fitted at one end within a notch in the sleeve J^2 and pivoted in place by a pin j^9. It has two nut-segments j^{10} j^{11}, each of which has a thread-pitch the reverse of the pitch of the other. When the lever is rocked in one direction, one of its nut-segments will engage with one of the screw-threads on the shaft J', thus causing the reciprocation of the sleeve J^2 in one direction. When the lever J^3 is reversed, its other nut-segment is engaged with the other thread of the shaft J', and consequently the sleeve J^2 will be reciprocated back again to the starting position. Tappets j^{12} j^{13}, arranged upon portions of the framework A of the machine, reverse the lever J^3.

The sleeve J^2 receives a collar h^{21} on the tubular shaft h^{15} and is engaged with said collar, so that it reciprocates the said shaft in accordance with its own reciprocations. It does not, however, reciprocate the shaft h^{16}, although this passes through it.

By reciprocating the tubular shaft h^{15} the spool or bobbin is moved relatively to the ring h^{14}, whence the roving is laid on the spool or bobbin, and hence the roving will be laid on in coils side by side from one end of the spool or bobbin to the other.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination with a jenny-frame and a shaft for a spool or bobbin, of a shaft carrying two loosely-turning bevel-gears, one of which is driven by the jenny-frame and the other by the bobbin-shaft, a sleeve, that is provided with intermediate bevel-gears which engage with said loose bevel-gears, fixed on said shaft, two spur-gears frictionally engaged with each other mounted on the shaft carrying the bevel-gears and driven by the bobbin-shaft, one of said spur-wheels being connected with one of the loosely-turning bevel-gears and the other spur-wheel frictionally engaging with its shaft, and a worm-shaft

geared to the shaft carrying the bevel gear-wheels for reciprocating the spool or bobbin, substantially as specified.

2. The combination with a jenny-frame and a supporting-shaft, of another shaft as h^{15} for a spool or bobbin provided with pinions $i' i^2$ of unequal diameters fixed on said shaft, a third shaft as J having a sleeve fixed thereon that carries intermediate bevel gear-wheels $k^2 k^3$, spur-wheels $j' j^5$ of unequal diameters engaging with the pinions $i' i^2$ and frictionally engaged with each other, a friction device between one of said spur-wheels and the shaft J, a bevel-gear k' carried by the other spur-wheel and engaging with the intermediate bevel-gears $k^2 k^3$, a bevel-gear k^4 loosely mounted on shaft J and engaging with the intermediate gears k^2 k^3, said bevel-gear k^4 being driven by the jenny-frame, substantially as specified.

3. The combination with the jenny-frame and a supporting-shaft therefor, a shaft as h^{15} for the spool or bobbin carrying pinions $i' i^2$ of unequal diameters which are fixed thereon, a shaft as J, carrying a bevel-gear which is driven from said jenny-frame, a sleeve fixed on said shaft and carrying intermediate bevel-gears, spur-wheels $j' j^5$ also of unequal diameters on the shaft J, and meshing with the pinions $i' i^2$, means for producing frictional engagement between spur-wheels $j' j^5$, a frictional device intermediate one of the said spur-wheels and the shaft J, while the other spur-wheel is provided with a bevel-gear engaging with the intermediate bevel gear-wheels, a worm-shaft, means engaging therewith for reciprocating the spool or bobbin, and the gear connection between said worm-shaft and the shaft J, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM H. H. SISUM.

Witnesses:
ANTHONY GREF,
WILLIAM A. POLLOCK.