No. 771,499. PATENTED OCT. 4, 1904.

C. A. ROGERS.

VERTICAL SPINDLE ATTACHMENT FOR MILLING MACHINES.

APPLICATION FILED MAR. 7, 1904.

NO MODEL.

Fig. 2.

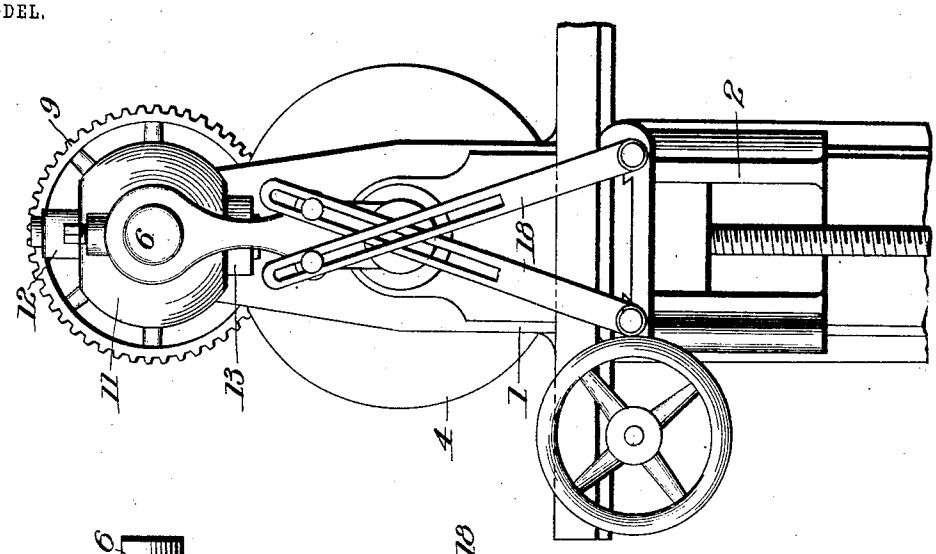
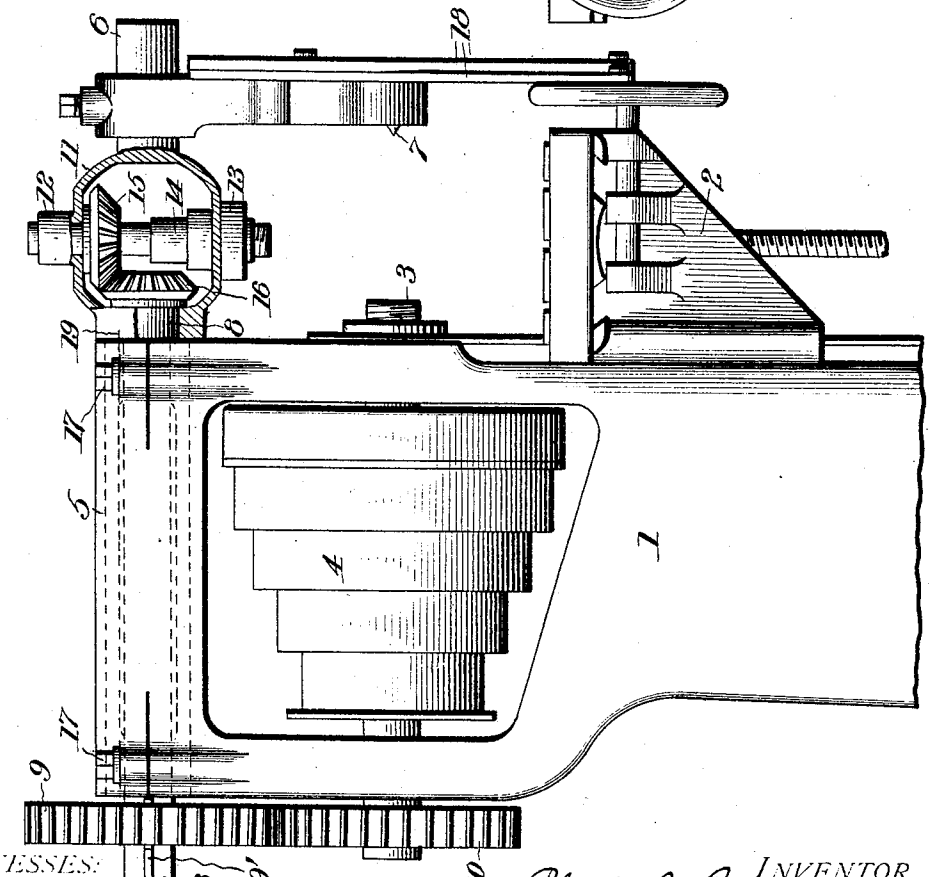


Fig. 1.



WITNESSES:

C. M. Walker.

Ida M. Dumont.

INVENTOR

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No. 771,499. Patented October 4, 1904.

UNITED STATES PATENT OFFICE.

CHARLES A. ROGERS, OF DES MOINES, IOWA, ASSIGNOR OF ONE-HALF TO EDWARD J. ILL, OF DES MOINES, IOWA.

VERTICAL SPINDLE ATTACHMENT FOR MILLING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 771,499, dated October 4, 1904.

Application filed March 7, 1904. Serial No. 196,884. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. ROGERS, a citizen of the United States, residing at Des Moines, in the county of Polk and State of Iowa, have invented a new and useful Vertical Spindle Attachment for Milling-Machines, of which the following is a specification.

My invention relates to milling-machines; and its object is to provide for such machines, especially those of the "knee" type with overhanging supporting-arm for the horizontal cutter-spindle and knee, a vertical cutter-spindle attachment which may be readily adjusted to operative position or as readily thrown out of operation without loss of time and without interfering with the operation of the main or horizontal spindle of the machine. I attain these objects by locating the driving-train for the vertical spindle within the overhanging arm itself, as shown in the accompanying drawings, in which—

Figure 1 is a side elevation of so much of a milling-machine as is necessary to show the application of my attachment, and Fig. 2 is a front elevation of the same.

Like numerals refer to like parts in both the figures.

The main frame 1 of the machine carries the usual adjustable knee 2 and is provided with the main spindle 3, on which is mounted the driving-cone 4. Above and parallel to the main spindle is an adjustable clamping bearing or support 5 for an overhanging arm. All these are well known in machines of this type and need no further description.

Instead of mounting in the clamping-support 5 the usual form of overhanging arm, which merely serves to steady the outer end of the horizontal spindle and knee, I provide an arm 6, to which may be attached, as usual, a spindle-supporting center 7, and mount axially in said arm a driving-shaft 8, connected at its rear end by suitable gears, as 9 10, to the rear end of the main spindle of the machine.

Suitably located on the arm 6 is a housing 11, shown partially broken away, in bosses on which, as at 12 13, is journaled the vertical spindle 14. Any suitable form of gearing may be used to transmit power from shaft 8 to shaft 14, and I have shown miter-gears 15 16 as one form, though I do not wish to limit myself thereto, as spiral or other gearing may obviously be used.

The gear 9 has preferably a splined connection 9′ with shaft 8, and said shaft is sufficiently long so that gear 9 may be drawn out of mesh with gear 10 to stop the driving-train of the vertical spindle when desired. The arm 6 may then be rotated through a quarter or half circle and the main horizontal spindle used to drive a cutter in the usual manner without removal of or interference from the vertical spindle. The usual clamp-screws 17 and knee-braces 18 may be used, and an index or "0" mark 19 may be placed on the arm and clamp-bearing to indicate a truly vertical position of spindle 14, if desired.

It is apparent that my attachment may be readily applied to existing machines of the type mentioned without in any way disturbing its adjustments and without reconstruction of any of its parts and when so applied greatly increase the usefulness and capabilities of such machines. Both cutters may be used simultaneously, if desired.

So far as I am aware all vertical spindle attachments heretofore used have either been attached directly to the forward end of the main spindle or located on swing-supports above the same and driven by gears secured to the forward end of, or intermediately of, said spindle. I believe I am the first to locate a vertical cutter-spindle and driving-train therefor in the cutter and knee supporting arm of a milling-machine, and I intend to claim the same broadly.

My attachment may be modified in many ways, as will be apparent to those skilled in the art, without departing from the spirit of my invention, since

What I claim is—

1. In a milling-machine, an overhanging arm, a knee-support removably secured to one end of said arm, a cutter-spindle journaled intermediately in said arm and means for driving said cutter-spindle from the main spindle of the machine; substantially as described.

2. In a milling-machine, a main spindle, an angularly-adjustable arm above said spindle, a cutter-spindle journaled in said arm, and driving connections between said cutter-spindle and the rear end of the main spindle outside the bearing of said main spindle; substantially as described.

3. In a milling-machine, in combination, a main spindle, an angularly-adjustable supporting-arm above said main spindle and parallel therewith, a cutter-spindle journaled transversely of said arm, a shaft journaled axially in said arm, gearing connecting the forward end of said shaft with said cutter-spindle and gearing connecting the rear end of said shaft with the rear end of said main spindle; substantially as described.

4. In a milling-machine, a main spindle, an angularly-adjustable supporting-arm above said spindle, a cutter-spindle journaled in said arm and adjustable therewith, a shaft journaled axially in said arm gearing connecting said shaft with said cutter-spindle, and a detachable gear connecting the opposite end of said shaft with said main spindle; substantially as described.

5. In a milling-machine, a main spindle, an angularly-adjustable and removable arm above said spindle, a cutter-spindle journaled transversely in said arm, power-transmitting gearing between said cutter-spindle and the rear end of said main spindle, means for securing said cutter-spindle in either operative or inoperative position, and means for disconnecting said power-transmitting gearing; substantially as described.

6. In a milling-machine, a main spindle, an angularly-adjustable arm above said spindle, a knee-support adjustably secured to its forward end, an auxiliary cutter-spindle journaled in said arm at an intermediate point thereof, and driving connections between said main spindle and said auxiliary spindle; substantially as described.

7. In a milling-machine, a main spindle, an angularly-adjustable arm above said spindle, a knee-support adjustably secured to the outer end of said arm, an auxiliary cutter-spindle journaled transversely at an intermediate point in said arm, driving-gearing connecting said main and auxiliary spindles, and means for disconnecting said gearing; substantially as described.

8. A vertical spindle attachment for milling-machines, comprising a cylindrical arm, a cutter-spindle journaled transversely at an intermediate point in said arm, and a driving-train located in said arm and adapted to connect said cutter-spindle with the main spindle of a milling-machine; substantially as described.

9. A vertical spindle attachment for milling-machines comprising a cylindrical arm, a cutter-spindle journaled transversely at an intermediate point in said arm, a shaft journaled axially in said arm, gearing connecting said cutter-spindle and said shaft and gearing adapted to connect said shaft with the main spindle of a milling-machine, substantially as described.

10. A vertical spindle attachment for milling-machines comprising a cylindrical arm, a cutter-spindle journaled transversely at an intermediate point in said arm, driving-gearing for the cutter-spindle adapted to be connected to the main spindle of a milling-machine and a cylindrical forward extension on said arm adapted to receive a knee-support, whereby said arm may be rotated in the frame of a milling-machine to throw the cutter-spindle out of operative position without altering the position of the knee-support, substantially as described.

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

CHARLES A. ROGERS.

Witnesses:
T. L. SELLERS,
JOSEPH L. ILL.