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Patented July 23, 1901.

L. J. MONAHAN.  
SCREW CUTTING ATTACHMENT FOR LATHES.

(Application filed Apr. 5, 1901.)

(No Model.)

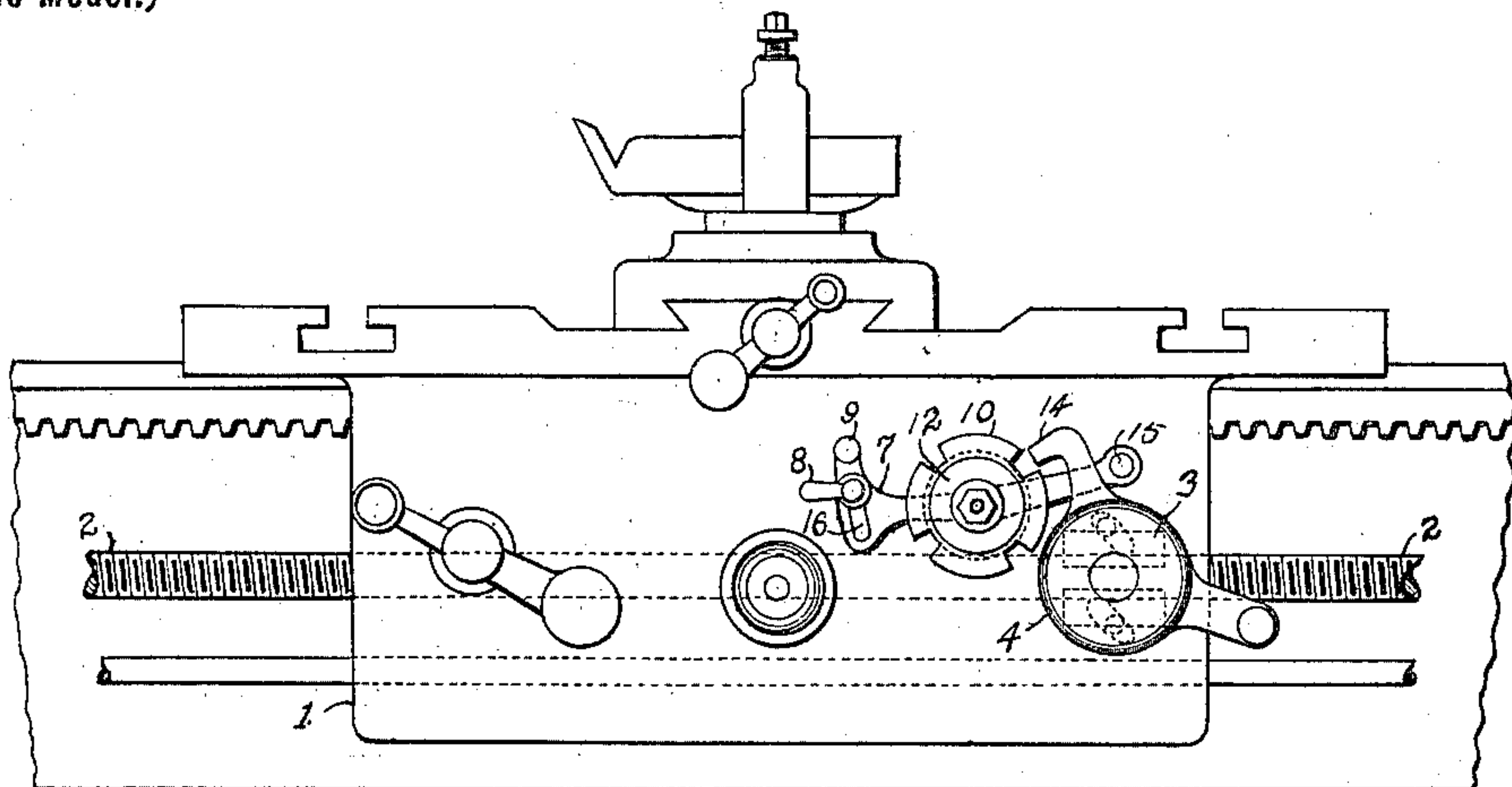


Fig. 1.

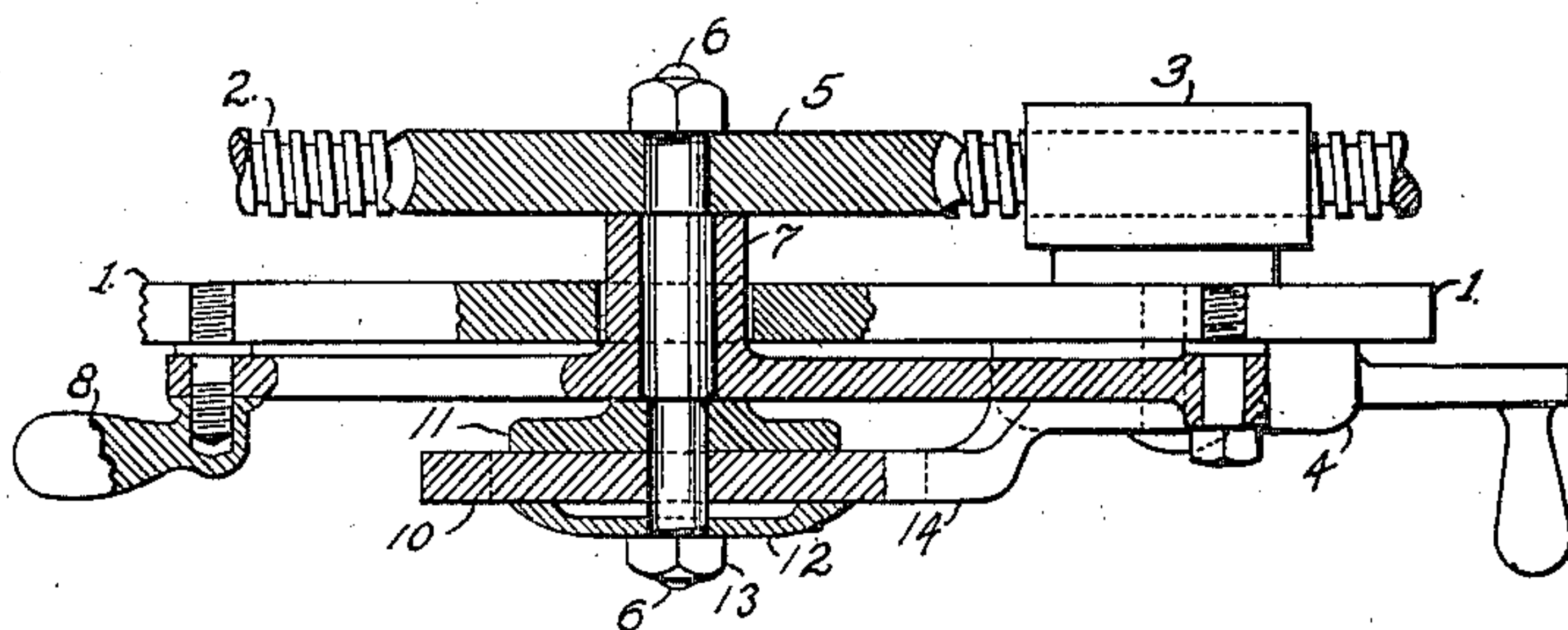


Fig 2.

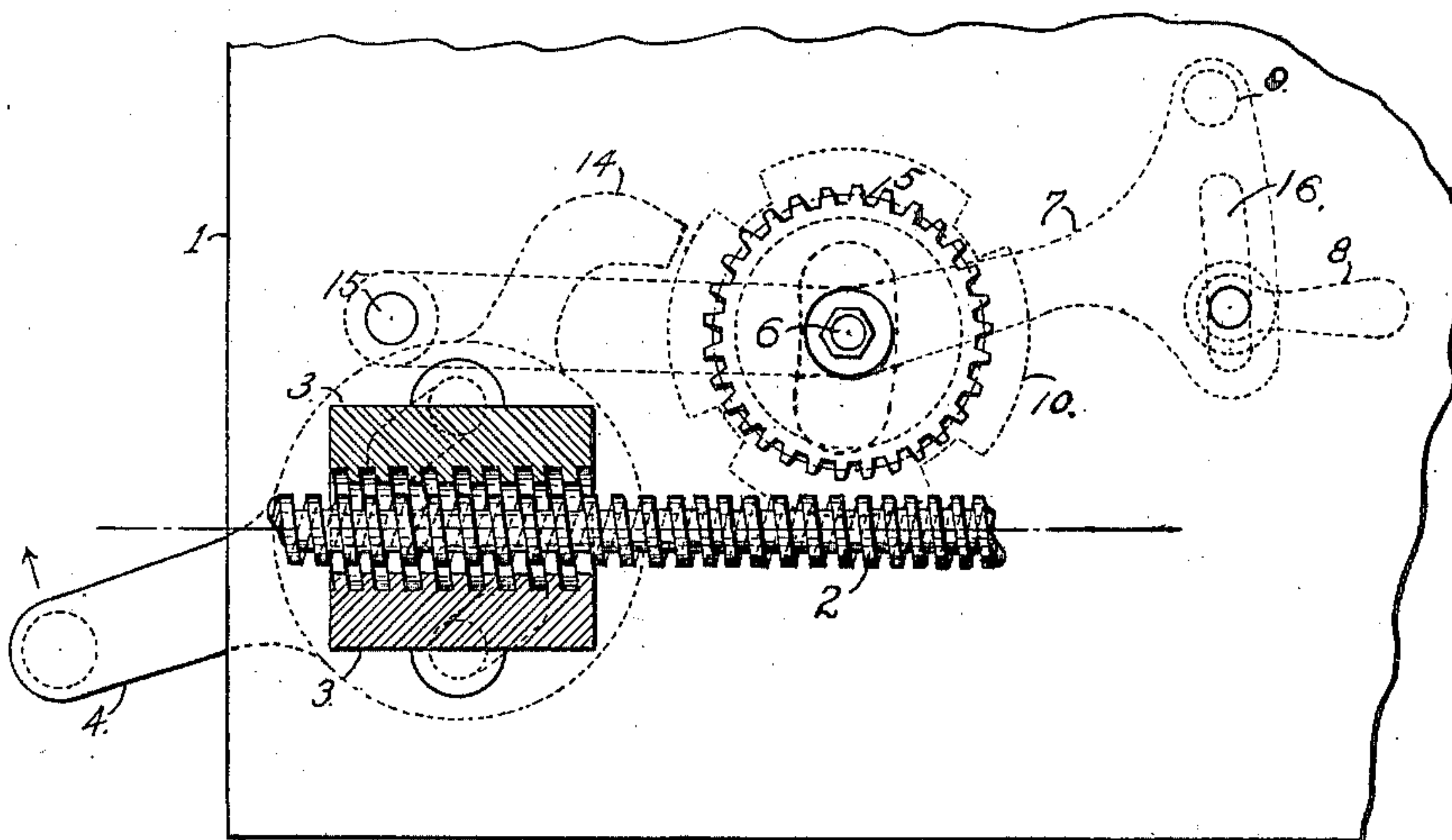


Fig 3.

Witnesses

P. A. Farrell

C. M. McDonald

Inventor

Louis J. Monahan



# UNITED STATES PATENT OFFICE.

LOUIS J. MONAHAN, OF OSHKOSH, WISCONSIN.

## SCREW-CUTTING ATTACHMENT FOR LATHES.

SPECIFICATION forming part of Letters Patent No. 679,238, dated July 23, 1901.

Application filed April 5, 1901. Serial No. 54,478. (No model.)

*To all whom it may concern:*

Be it known that I, LOUIS J. MONAHAN, a citizen of the United States, and a resident of Oshkosh, in the county of Winnebago and State of Wisconsin, have invented a new and useful Improvement in Lathes, of which the following is a specification.

The invention relates to a screw-cutting attachment for lathes.

10 The object of the invention is to provide a means for cutting screws of any number of threads per inch without stopping or reversing the lathe. The device may be applied to lathes now in use, as well as to new designs, and may be modified to suit any special design without changing the principal.

Referring to the accompanying drawings, Figure 1 represents a front view of an ordinary lathe-carriage, showing the application 20 of the invention. Fig. 2 represents a section through the center of the toothed worm-wheel 5 and the notched disk 10. Fig. 3 represents a rear view of the lathe-apron 1, showing the construction of the device on the inside of the apron.

25 The numeral 1 shows a lathe-carriage of ordinary construction. 2 shows the lead-screw for driving the carriage along the ways for screw-cutting. 3 shows lock or half nuts for locking into the screw 2, which are shown attached to the apron, which is the general design in modern lathes.

35 In constructing the device a toothed or worm wheel 5 is provided, having its teeth shaped to fit the lead-screw, and the number of teeth being equal to thirty or any reasonable multiple of the pitch of the lead-screw 2 the toothed wheel 5 is secured to a shaft 6, said shaft having its bearing in a casting or bracket, preferably of the shape 7 or any neat design. The casting 7 (shown in the drawings) is pivoted at 15 to the lathe-carriage apron and has a circular slot 16 in its opposite end, which allows the casting a limited 45 vertical movement for the purpose of disengaging the toothed wheel from the lead-screw. Directly above the slot 16 is a handle 9. A clamping-screw 8 is loosely fitted to the slot 16 and screwed into the apron. A flange 11 50 is tightly fitted to the shaft 6, having its face

turned true and smooth. A disk 10 is fitted loosely to the shaft 6 and allowed to rest against the flange 11. The disk is turned to a larger diameter than the flange 11. The said disk has a slot or equally-divided slots 55 in its periphery, the number being in proportion to the number of teeth of the worm-wheel 5. The device 4 for locking the nuts 3 is of any ordinary construction, with the addition of the extension 14, the end of which 60 should be fitted to the slots in the disk and so adjusted that when the end of said extension is engaged in a slot the lock-nuts 3 will engage the lead-screw 2. On the drawings the slots show a slight taper on their sides for 65 the purpose of allowing the projection 14 to easily enter a slot in the disk. The disk is driven or rotated by means of the friction between itself and the flange 11. To keep the surfaces in contact, a spring-washer 12 is provided and loosely fitted on the shaft 6 and 70 held in place by a nut on the end of the shaft, whereby the amount of friction may be varied.

To put the device in operation, the clamping-handle 8 is turned to allow the casting 7 75 to be moved. The casting is then moved down until the worm-wheel 5 engages the threads of the lead-screw. The handle 8 is then turned to tighten and hold the bearing or casting 7 in place. It will be seen that 80 the lead-screw acts as a worm and turns the wheel 5. When the carriage is moved along the ways, the lead-screw acts as a rack, causing the wheel 5 to rotate. In the drawings the disk is shown as having four slots or 85 notches. The number of teeth in the wheel 5 will in this case be four times the pitch of the lead-screw. Then starting with one slot or notch at a given point and moving the carriage one inch along the ways, a second notch 90 will be at the point, thus showing that the nuts 3 can only be hooked in the lead-screw at certain points, as the projection 14 will rest against the periphery of the disk 10 until a slot or notch reaches it. 95

In ordinary thread-cutting on lathes, where the thread to be cut the pitch of which is any other than a multiple of the pitch of the lead-screw, it is necessary at the end of the cut to either run the lathe backward until 100



the tool is at the starting-point or to stop the lathe and unhook the nuts 3 and move the carriage back a certain number of inches, when the nuts are hooked in and the lathe started for the next cut. Either of these methods cause inconvenience and loss of time.

With this device the lathe is started and allowed to run until the work is finished. The carriage is moved to the starting-point, and the handle 4 is firmly grasped and pulled in the direction of locking the nuts 3. It is obvious that if the projection 14 does not coincide with a notch or slot in the disk 10 the nuts 3 will not engage the lead-screw until a notch in the disk reaches the point 14, which will drop in the notch and at the same time allow the nuts 3 to engage the screw 2, which causes the carriage to travel along the ways, cutting the thread. At the end of the cut the tool is drawn out of the cut as usual and the handle 4 pushed down, unlocking the nuts 3 and pulling the projection 14 out of its seat in the disk 10, thus stopping the travel of the carriage, which is then moved back to the starting of the cut. As soon as the projection 14 leaves the notch in the disk 10 the said disk immediately starts to rotate, caused by the rubbing surfaces between it and the flange 11.

The disk or plate 10 must be divided in relation to the number of teeth in the worm-wheel 5 according as it is desired to have the tool track in even or odd pitches, or there may be a separate disk for each occasion—even, odd, or fraction threads per inch.

It is obvious that to have the tool track or enter correctly into its cut a certain point must be started from—viz., a certain number of revolutions of the lead-screw and a certain distance travel of the carriage. It will also be seen that a certain part of a revolution of the disk 10 must be reached before the lock-nuts 3 will engage the lead-screw.

It is evident that the carriage must be moved back one or any number of inches when the screw is at rest before the nuts can be engaged in the lead-screw, or if the carriage is at rest the lead-screw will make a number of revolutions equal to its pitch before the nuts can engage the screw, and when the lathe is in motion and the carriage moved back the same time a compound rotation takes place in the same direction, but always keeps the carriage in the same relation with the lead-screw. Therefore in cutting any thread it is only necessary to unhook the nuts from the lead-screw, move the carriage back to the starting-point for the next cut, and pull the handle up until the nuts engage the screw and repeating this until the work is finished. When the device is not in use, the bracket or casting 7 is raised up, bringing the teeth of the wheel 5 out of contact with the screw.

Having fully described the invention, what I claim, and desire to secure Letters Patent, is—

1. In a lathe the combination with a lead-screw and carriage-apron, of a movable bracket or casting mounted on said apron, a toothed wheel having a shaft or hub extension and journaled in said bracket or casting, a notched wheel or disk mounted on said shaft or hub, and means for securing the bracket to the carriage-apron in different positions.

2. In a lathe the combination with a carriage and lead-screw, of a toothed wheel adapted to mesh with said screw and having a shaft or hub extension, a bracket movably attached to the carriage and having the said shaft or hub extension journaled therein, a notched wheel or disk removably mounted on the said shaft or hub and means for frictionally securing the notched wheel or disk thereto, whereby the said disk may be removed and substituted with another or differently divided disk.

3. In a lathe the combination with a carriage and lead-screw, of a toothed or worm wheel adapted to be releasably held in mesh with said lead-screw and having a shaft extension 6, a disk or plate 10 mounted on said shaft and having a series of equidistant taper notches in its periphery and said notches decreasing in size toward the center of the disk or plate for the purpose set forth.

4. The combination in a lathe of a lead-screw of a toothed wheel 5 having a shaft extension 6, a notched wheel or disk 10 mounted on the said shaft, a nut-actuating lever 4 having the solid part 14 adapted to engage a notch in the said notched wheel or disk, and means for supporting the said shaft 6 in different positions causing the toothed wheel 5 to engage or disengage the lead-screw.

5. In a lathe the combination with a carriage-driving screw, of a toothed wheel to engage said screw, a spindle or shaft having one end secured to the said toothed wheel, a flange secured to said shaft, a notched wheel or disk loosely fitted to said shaft and adapted to rest against the said flange, a washer loosely fitted to the shaft and adapted to rest against the disk, a nut fitted to the end of the said shaft for the purpose of holding the disk and washer in place, means for supporting said tooth-wheel and disk.

6. In a lathe the combination with a carriage and lead-screw, of a toothed wheel adapted to engage and mesh with the said lead-screw, a shaft secured to said toothed wheel and journaled in a pivoted bracket, a flange secured to said shaft, a revoluble notched wheel or disk mounted on said shaft, means for holding the notched disk against the said flange under tension.

7. In a lathe the combination with a car-



riage and lead-screw, of a toothed wheel hav-  
ing a shaft or spindle attached thereto, a  
notched wheel or disk frictionally attached to  
the opposite end of the said shaft or spindle,  
5 a bracket or casting pivoted to said carriage  
and having the said shaft or spindle journaled  
therein, means for clamping said bracket or  
casting in different positions around said

pivot whereby the toothed wheel will engage  
or disengage the lead-screw.

In testimony whereof I affix my signature  
in presence of two witnesses.

LOUIS J. MONAHAN.

Witnesses:

BER. J. DALY,  
GEORGE E. WILLIAMS.

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