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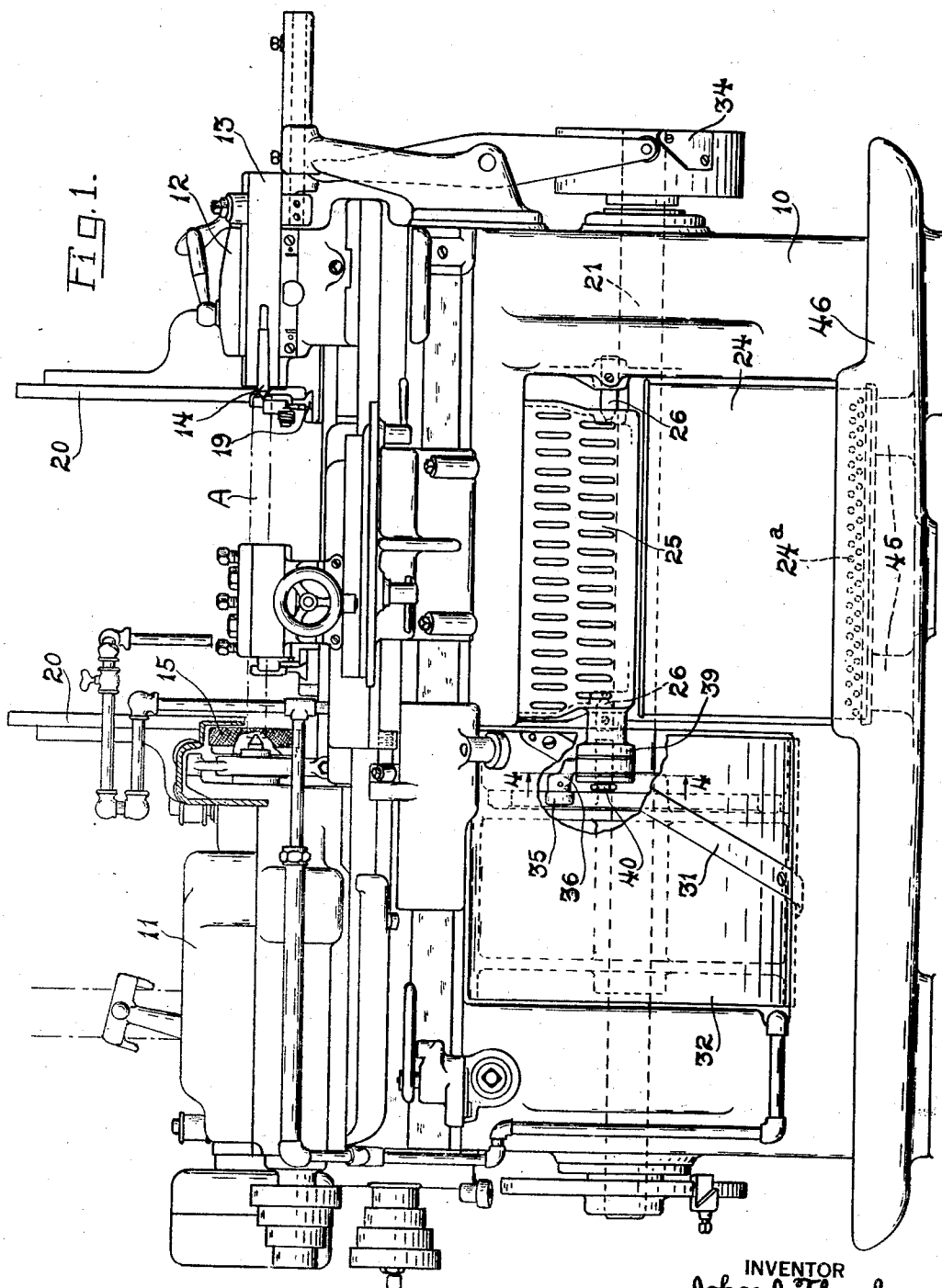
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CHIP AND BLANK SEPARATOR FOR LATHES

Filed March 30, 1923

2 Sheets-Sheet 1



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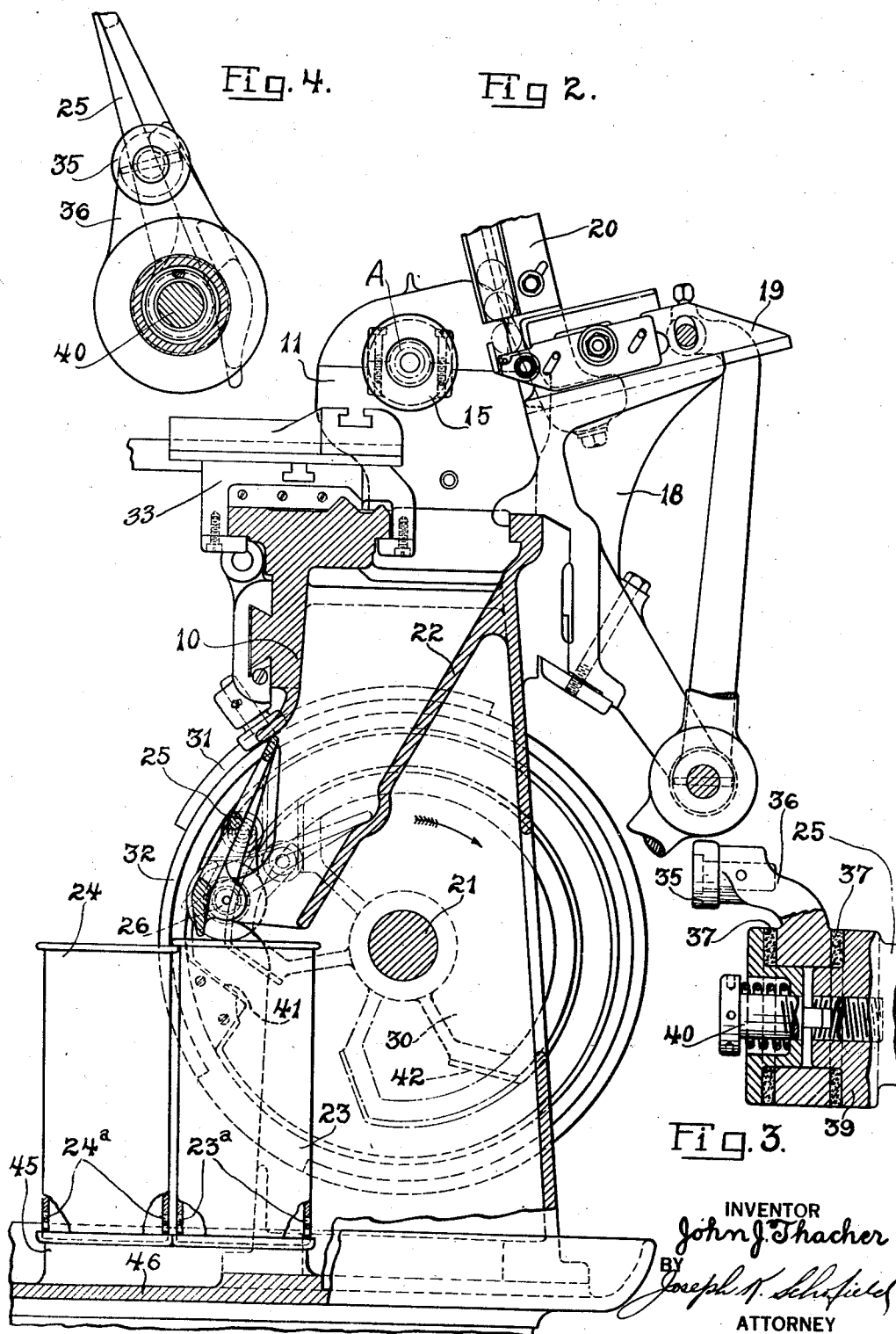
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2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE.

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CHIP AND BLANK SEPARATOR FOR LATHES.

Application filed March 30, 1923. Serial No. 628,848.

This invention relates to lathes and particularly to an improvement in lathes of the type shown in the patent to Müller 1,252,928 granted January 8th, 1918. The invention may be applied to other types of metal cutting tools but as it is of especial value in lathes of the automatic type, it will be illustrated in combination therewith.

An object of the present invention is to provide a mechanism whereby finished blanks, after having been released from the work supporting and rotating means, or cut from bar stock, may be guided into a receptacle provided therefor without becoming mixed with the chips generated during the turning operations.

Another object of the invention is to provide guiding means normally operative to guide chips into a receptacle and adapted, when a blank is about to be released or cut off, to guide the blank into a separate receptacle.

One feature which enables me to accomplish the above named objects is that I provide an oscillating plate at the lower part of a guideway formed within the base of the lathe which may be moved to two positions. In one position it permits the chips to fall into a special receptacle and in its other operative position guides the finished work pieces or blanks into a separate receptacle. Another feature of advantage is that cam means are provided which through a frictional connection control the movements of this plate in timed relation to the operative movements of the machine.

During operation of the lathe while the tool is cutting the blank, the plate is retained in a position so that chips are prevented from entering the receptacle for the blanks. When the cutting operation has been completed and the blank is about to be released, the plate is oscillated so that the blank will be prevented from entering the receptacle for the chips and will be guided into a separate receptacle which the chips are prevented from entering. As soon as the turning operation is again started, the plate is returned to its initial position.

With these and other objects in view, my invention consists in the features of construction and operation set forth in the following specification and illustrated in the accompanying drawings.

In the accompanying drawings annexed

hereto and forming a part of this specification, I have shown my invention embodied in an automatic lathe but it will be understood that the invention can be embodied in other metal cutting machines and that the drawings are not to be construed as defining or limiting the scope of the invention. The claims appended to this specification are relied upon for that purpose and, wherever the term "lathe" is used, it is to be understood in its generic sense as defining any metal cutting or turning machine.

In the drawings:

Figure 1 is a front elevation of an automatic lathe showing the present invention incorporated therein.

Fig. 2 is a transverse sectional view of the complete machine.

Fig. 3 is a fragmentary sectional view showing the mechanism for operating the oscillating plate, and

Fig. 4 is a sectional view taken on line 4-4 of Fig. 1.

In the above mentioned drawings, I have shown but one modification of the invention which is now deemed preferable but it is to be understood that changes and modifications may be made within the scope of the appended claims without departing from the spirit of the invention.

Briefly, the embodiment of the invention selected for illustration in its broadest aspects comprises the following principal parts: first, a lathe, the one selected for illustration being of the automatic type similar to that described in the above mentioned patent; second, work supporting and rotating means on said lathe; third, a tool operating slide; fourth, transfer mechanism adapted to transfer a blank from a magazine into operative position on the work supporting and rotating means; fifth, automatic mechanism comprising a cam shaft for controlling these means in predetermined timed relation to each other; sixth, a guideway extending obliquely through the bed of the machine for guiding the finished work pieces and the chips; seventh, two separate and independent receptacles placed adjacent the lower end of this guideway; eighth, an oscillating plate which in one position may allow the chips to fall into one of the receptacles and in its other operative position will guide work pieces or blanks into the other receptacle; and ninth, means for actuating

this oscillating plate in timed relation to the other mechanisms of the machine.

Referring more in detail to the figures of the drawings, I show the principal operative mechanisms of a lathe of the automatic type comprising a base 10 having a headstock 11 mounted on one end thereof and a tailstock 12 mounted at the other end. The tailstock 12 is provided with a plunger 13 carrying a center 14 which is automatically operated. Also, preferably, the work rotating member or chuck 15 in the headstock 11 is automatically opened and closed by suitable means. In rear of the machine is a bracket member 18 on which is mounted a blank transferring mechanism 19 adapted to transfer a work blank A from a magazine 20 mounted on the bracket 18 to operative position on the work supporting and rotating members. As each of these mechanisms is or may be substantially similar to those disclosed in the above mentioned patent or in application No. 621,368 filed February 26, 1923, further description of these mechanisms is not thought to be necessary. It is only necessary to state that these mechanisms are controlled in predetermined timed relation to each other preferably by cam actuated means. Preferably a main cam shaft 21 is provided for this purpose on which may be mounted cams for actuating each of the mechanisms.

Extending obliquely through the base 10 of the machine is a longitudinal web 22 inclined as will be evident from an inspection of Fig. 2. The upper surface of this web 22 serves as a guideway permitting chips generated during the process of cutting, as well as the cutting fluid, to fall from the work directly through the bed or the base 10 of the machine. The chips and lubricant or cutting fluid after passing down the web 22 may enter a receptacle 23 placed contiguous to the lower end of the web 22.

It will be understood that in the operation of the machine if no additional mechanism were supplied, finished work pieces A, when released from the work supporting and rotating means, or cut off from bar stock, would also fall into the receptacle 23 with the chips. As this would necessitate later separation of the work pieces A from the chips generated during operation, means are provided to automatically deliver the finished blanks to a separate receptacle 24 in a manner which will prevent any of the chips becoming mixed with them. For this purpose, an oscillating plate 25 is provided adapted to oscillate about the trunnions 26 shown clearly in Fig. 1. In the upper position of this oscillating plate 25, which is shown in full lines, it will be seen that chips and cutting fluid may fall directly into the first receptacle 23. By deflecting or oscillating the plate 25 to its inclined lower position as shown in dotted lines, the finished

work piece A as it drops from its supporting and rotating means, such as the chuck 15 and tailstock center 14, will be guided into the receptacle 24 provided just in advance of the receptacle 23 for the chips. It will be seen also that in the normal or upper position of this plate 25, the passage to the receptacle 24 for the blanks A is completely closed thus preventing the chips from entering the forward receptacle. Similarly, with the oscillating plate 25 in its lower position, the passage to the rear receptacle 23 for the chips is entirely closed.

In order to oscillate or otherwise move this oscillating plate 25, cam means are provided which automatically actuate it from one extreme position to the other. These means are so arranged that they will actuate the plate 25 in proper predetermined timed relation to the movements of the other operative mechanisms.

Preferably, I provide a cam 30 which may be mounted on a main cam shaft 21 together with the cams for operating the other mechanisms of the machine. This cam 30 is so formed and positioned that just at the time the tailstock plunger 13 is retracted to release the blank from the work supporting and holding means, or just as the cutting tools are finishing their operation, the plate 25 will be oscillated to its lower position.

On the same cam shaft 21 with the cam 30 actuating the plate 25 is a cam 31 on a drum 32 for operating the tool slide or carriage 33, a cam 34 for the tailstock plunger 14, and other cams (not shown) for operating the blank transferring means and any other parts that require periodic movements. As each of these cams is fixed directly to the cam shaft, each of the mechanisms is actuated in accordance with a predetermined sequence.

The cam 30 which may be formed on the face of a web on the drum 32 is engaged by a roller 35 on the free end of a short lever 36 which oscillates about the trunnion 26 as shown in Fig. 1. This lever 36 by means of the friction disks 37 on opposite sides associated with the coiled spring 38 shown in Fig. 4, oscillates the oscillating plate 25. As shown in Fig. 1, the plate 25 is extended slightly beyond one of the trunnions 26 which extension 39 partly surrounds this trunnion. A threaded stud 40 provided in the extension 39 retains the parts of the frictional connection in adjusted position.

Preferably the lever 36 is oscillated to its lower inclined position by the roller engaging a plate 41 fixed to or forming a part of the actuating cam 30 and is also positively oscillated to its upper position by the sloping surface 42 on the cam shown most clearly in Fig. 2. The main portions of the cam are circumferential so that the lever 36 and also the oscillating plate 25 are main-

tained in their upper oscillated position during the major portion of the rotation of the cam shaft 21. It will be understood that by disposing the active part of the cam, comprising its sloping surfaces, in proper relation to other cams on this shaft that the oscillating plate 25 may be actuated in predetermined timed relation to the other mechanisms.

- 10 As the connection between the actuating lever 36 and the oscillating plate 25 is frictional, a blank A or other article becoming interposed between the parts of the base and the plate will not interfere with or
15 damage the mechanisms. The lever will oscillate and friction members between the lever and plate will slip thus permitting the plate to remain stationary. Also, in the event that a workman has his hands within
20 the guideway, the frictional connection between the lever and the plate will prevent any damage or injury being done.

From the above, it will be seen that during normal operation of the machine while cutting operations are in progress on the blank A, the plate 25 will be elevated. This allows all of the chips and cutting fluid to fall within their proper receptacle 23 and, as soon as the cutting operation has been
30 completed, and it is desired to convey the finished work A to another receptacle, the plate 25 is oscillated to its lower position. In this position, the finished blank A is guided to its special receptacle 24, and as
35 there are no chips falling at that time due to the cutting operation being completed, no chips are admitted to this receptacle 24 with the finished blanks. As soon as the blank A has been released from the work supporting
40 and rotating means and has passed through the guideway, the automatic transferring mechanism 19 operates to position another blank A upon the work supporting members comprising the chuck 15 and center 14. As
45 soon as this is accomplished, the cutting operation again begins. Just before the cutting operation is resumed, the oscillating plate 25 is again actuated to its upper position thus reopening the guideway for the
50 chips and closing the passage to the work holding receptacle.

As shown in Fig. 1, the plate 25 is preferably perforated or provided with openings so that the cutting fluid may at all times be
55 permitted to drain into the receptacle 33 or into the base of the machine.

Each of the receptacles is perforated as shown at 23^a and 24^a respectively. This permits oil on the chips and blank to drain
60 from these receptacles. As the receptacles are mounted upon suitable supports 45 within the drip pan 46 of the machine, all of the oil drained from receptacles 23 and 24 flows

into the drip pan and thence may be returned to the work by means of a pump of 65 usual form.

What I claim is:

1. A lathe comprising in combination, a base, work supporting and rotating means thereon, transfer mechanism adapted to position blanks in operative position, a tool carriage, means to automatically control the movements of the above mentioned parts in predetermined timed relation to each other, an oscillating plate supported upon said
70 base, an enclosed guideway formed within the base for the passage of chips downward therethrough, and means comprising actuating means for said oscillating plate to close
75 said guideway at its lower end and open another guideway for the finished blank when said blank is released from the supporting and rotating means.

2. A lathe comprising in combination, a base, work supporting and rotating means
80 thereon, transfer mechanism adapted to position blanks in operative position, a tool carriage, means to automatically control the movements of the above mentioned parts in predetermined timed relation to each other, an enclosed guideway extending downward
85 through the base and normally open at its lower end, a receptacle for finished blanks, an oscillating plate mounted within the base and normally held in one position to maintain said guideway open and to permit chips
90 to pass below it and through the base of the machine, and means to oscillate said plate to another position while a blank is being released and another blank is being
95 mounted on the work supporting and rotating means to permit the blank to pass over said plate and into the receptacle.

3. A chip and blank separating attachment for lathes comprising in combination, an oscillating plate, and means including a frictional connection to periodically oscillate said plate in predetermined timed relation to the movements of the operative parts
100 of the lathe.

4. An attachment for lathes comprising in combination, two receptacles adapted to be placed adjacent the base of the lathe, an enclosed guideway extending through the base of said lathe for chips and for completed blanks, and means including an oscillating plate pivotally mounted adjacent the lower end of said guideway normally permitting the chips generated during the cutting operation to enter one of the receptacles and preventing them from entering the other receptacle, said plate being movable to guide a finished blank into the other receptacle.

In testimony whereof, I hereto affix my signature.

JOHN J. THACHER.