

Sept. 12, 1933.

W. G. HOELSCHER ET AL

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LATHE BED CONSTRUCTION

Filed June 17, 1931

4 Sheets-Sheet 1

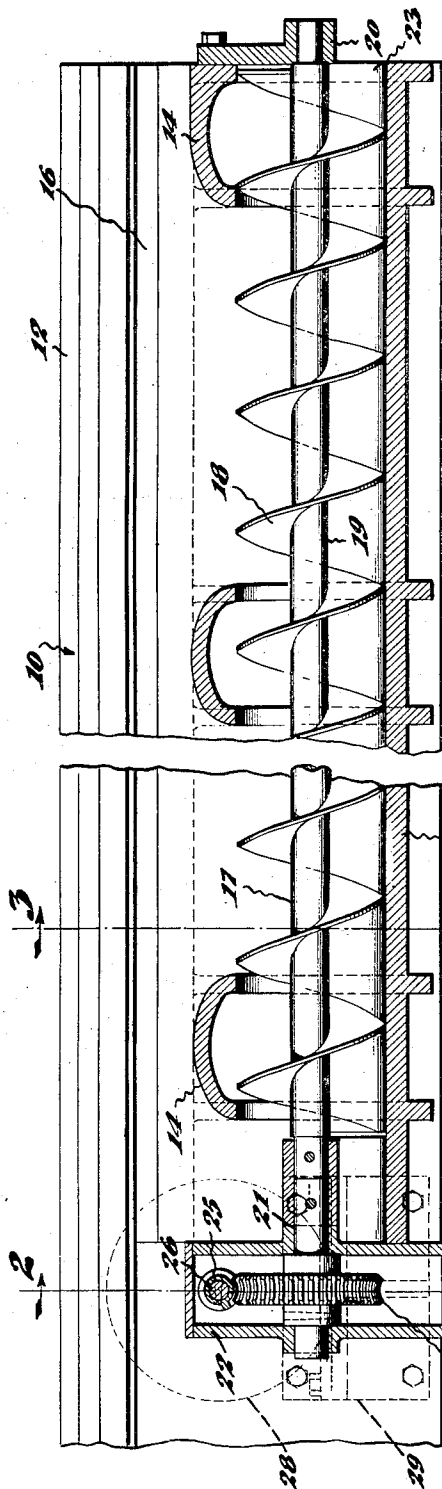


Fig. 1

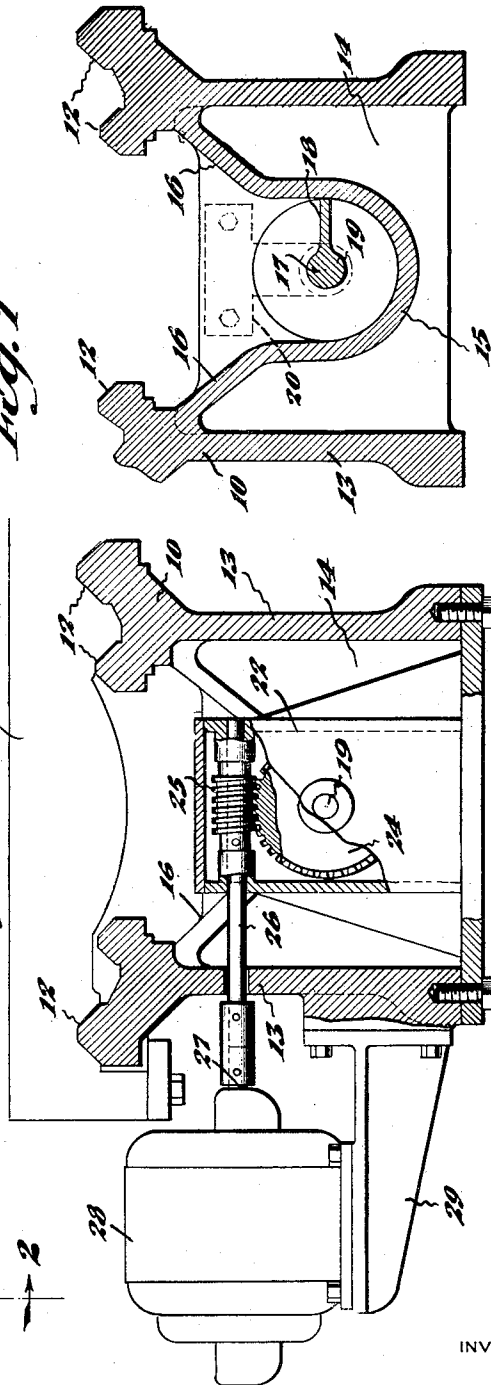


Fig. 2

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4 Sheets-Sheet 2

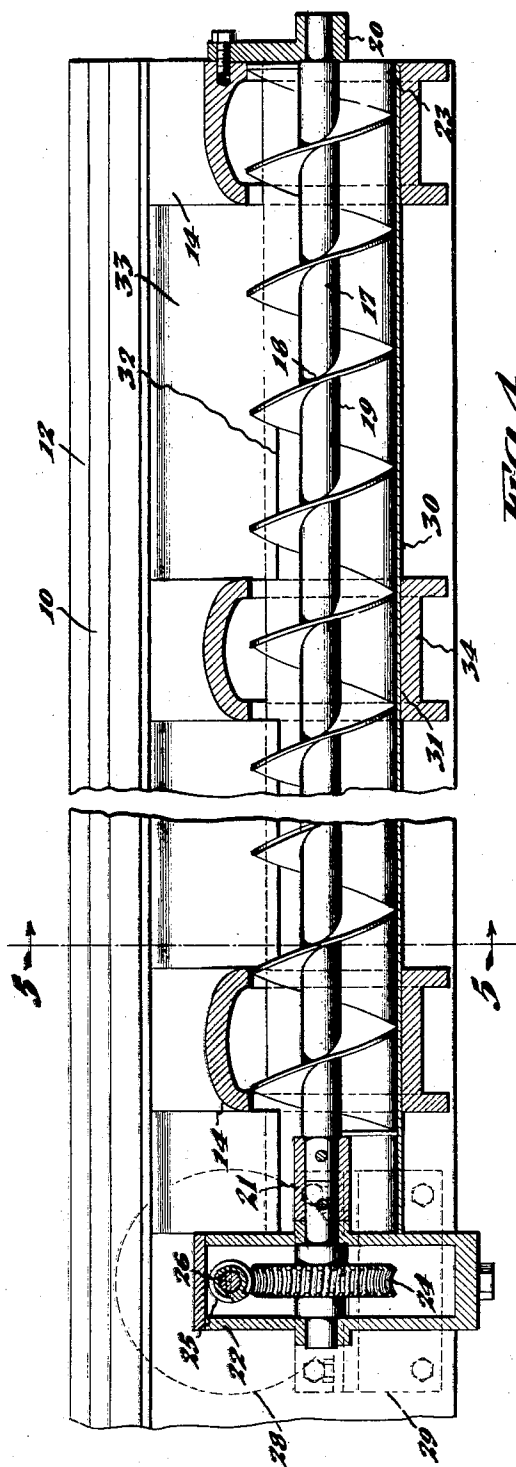


Fig. 4

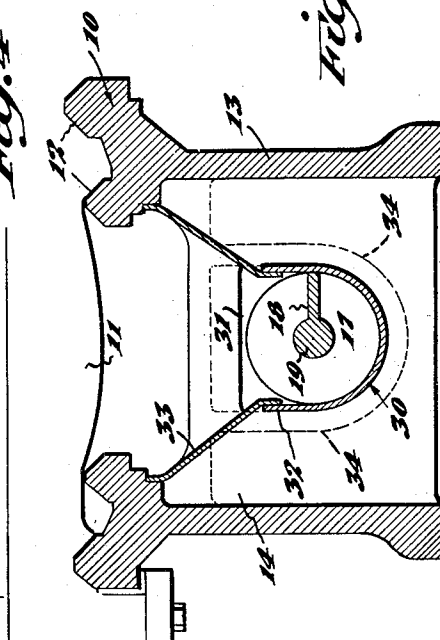


Fig. 5

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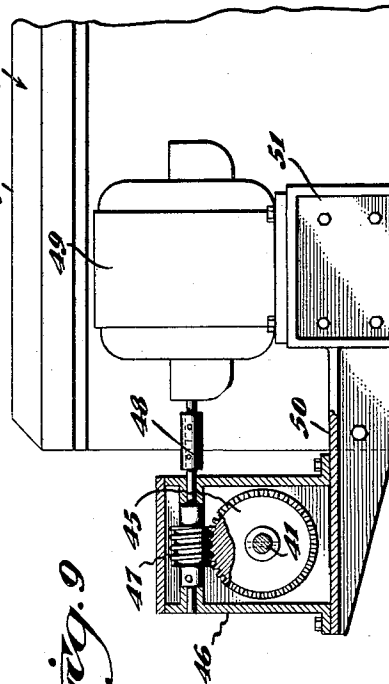
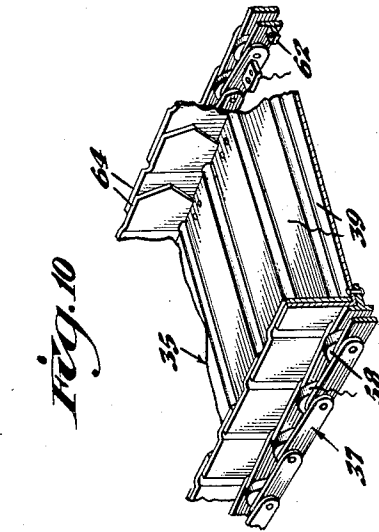
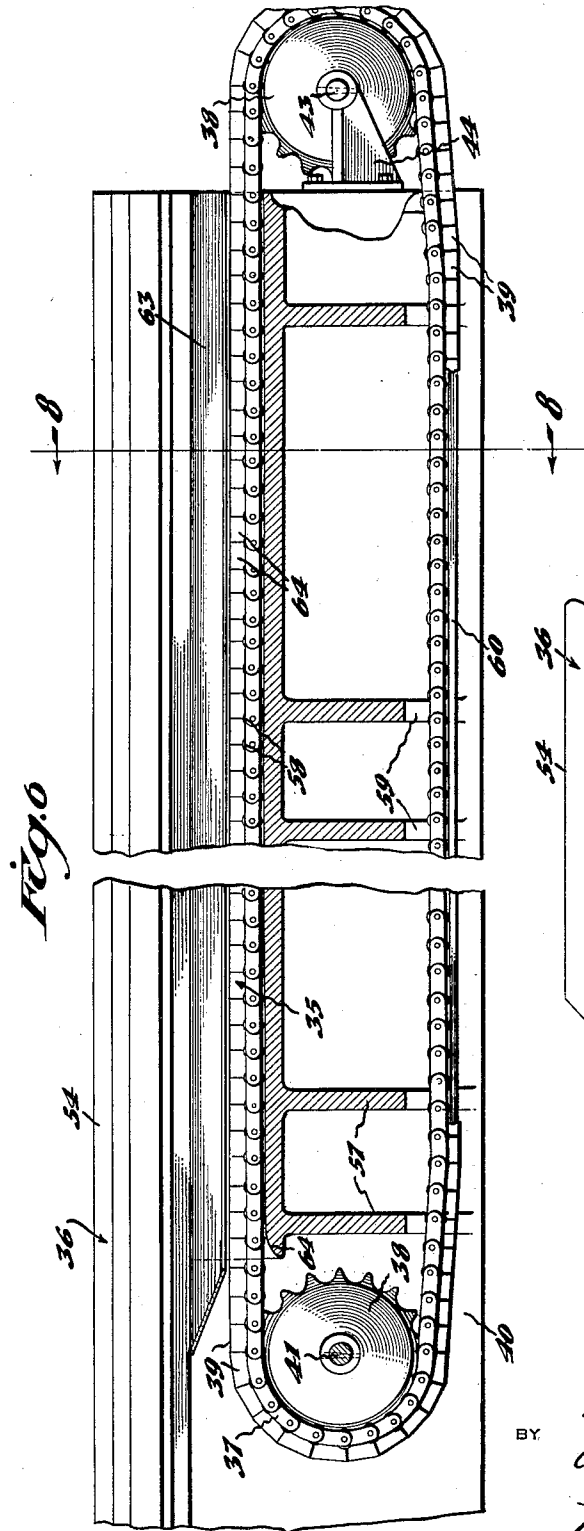
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4 Sheets-Sheet 3



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LATHE BED CONSTRUCTION

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Application June 17, 1931. Serial No. 545,044

10 Claims. (Cl. 82-32)

This invention relates to machine tools, especially lathes, and is particularly directed to improvements in lathe beds incorporating a means for receiving the chips and oil from the work and the ways of the lathe, and means for removing the same, and to features of improvement of the construction of the lathe bed for reinforcing and bracing the same against the usual working strains which are imposed thereupon.

It is the object of this invention to provide a lathe bed having the conventional spaced ways below which ways a chip receiving receptacle or trough is included, preferably within the lathe bed and wherein directing walls are provided for directing the chips and oil into the trough, and in which trough or receptacle a conveyor device is mounted for moving the chips and discharging the same, preferably from one end of the lathe bed. A further objective relates to the structure of the conveying device and its relation to the lathe bed.

It is another object of this invention to provide an improved construction for a lathe bed for strengthening and bracing the same, whereby all torsional strains and lateral strains are ineffective for twisting or disaligning the ways, or for destroying the initial form of the bed.

This object is carried out through the provision of specially formed cross walls in combination with a longitudinally extended portion joined to the cross webs and the general walls of the bed in a fashion whereby not only are the load and working thrusts suitably braced against, but at the same time a chip receptacle is included, as a part of the reinforcement means.

Other objects and certain advantages will be more fully apparent from the description of the accompanying drawings, in which:

Figure 1 is a longitudinal sectional view of a lathe bed showing the chip receiving trough and a conveyor means for disposal of the chips and other debris discharged from the work and the ways of the lathe bed.

Figure 2 is a sectional view taken on line 2-2, Figure 1, detailing the power connection to the chip conveyor means.

Figure 3 is a sectional view taken on line 3-3, Figure 1, showing the general cross-sectional appearance of the lathe bed for the purposes of strength and chip reception as described.

Figure 4 is a longitudinal sectional view of a modified form of lathe bed wherein the chip receptacle or trough is a fabricated part of the general construction.

Figure 5 is a transverse sectional view taken

on line 5-5, Figure 4, further detailing the built-in construction of the receptacle or trough.

Figure 6 is a fragmentary longitudinal sectional view of a lathe body or bed illustrating a modified form and arrangement of the chip receiving and discharging means.

Figure 7 is an end view partly in section, illustrating the drive for the modified chip discharging device.

Figure 8 is a sectional view taken on line 8-8, Figure 6, detailing the interior construction of the modified lathe bed.

Figure 9 is a sectional view taken on line 9-9, Figure 7, further detailing the drive for the modified chip discharging device.

Figure 10 is a fragmentary perspective view illustrating a portion of the endless conveyor device used in the modified construction.

To provide a trough-like chip receiving enclosure which mounts the chip conveying discharging or displacing device, the general structure of the lathe bed has been greatly reinforced and braced to provide an exceedingly strong supporting base for the lathe parts. The walls arranged in the lathe for directing the chips falling from the ways into the trough add to the general strength of the lathe bed.

Referring specifically to the drawings, the lathe bed is generally indicated at 10 and a conventional carriage 11 is shown mounted on the ways thereof. The ways 12, 12 are disposed in parallelism, as is conventional, on the top surface of the lathe bed 10 and a wide space is provided therebetween as a clearance for the chips removed from the work by the conventional tools

on the carriage, whereby the chips along with other debris which may accumulate on the ways may fall into the central portion of the lathe

bed. Generally speaking, the lathe bed comprises side walls 13 and cross ribs or septums 14 of plural wall form or of tubular construction. The trough 15 is preferably an integral part of the lathe bed but may be formed of heavy sheet metal and built into the general form of the lathe bed.

It is preferable to have the receptacle or trough disposed substantially throughout the length of the lathe bed or throughout the length over which the work is disposed.

The trough 15 may be of any form for the purpose of the chip reception from above insofar as the receptacle purposes are concerned and is built to fit the type of device which is incorporated therein for feeding the chips to one end of the lathe bed. The form which is particularly desir-

able is that which will have utility not only as a receptacle but which will materially aid in strengthening the general structure of the lathe bed.

- 5 The type of construction wherein the trough or chip receptacle is formed as an integrally cast part of the lathe bed, is illustrated in Figures 1 to 3 inclusive. The trough or receptacle is of semicircular form open at the top and includes a wall of substantial thickness which is extended to the side walls or way portions of the lathe by inclined side wall or deflecting wall portions 16. At that point where the trough portion joins the cross ribs or septums, it may be extended through the double wall construction of the septum in semicircular form and including the inclined connecting wall portions, which merely add to the strength of the structure when included within the double wall septums. The portion within the plural wall septums, for fully housing the conveyor device, may be strictly cylindrical.

- The arrangement of the trough wall of relatively substantial thickness centrally and longitudinally of the lathe bed connecting the cross ribs or septums aids in the general bracing of the lathe bed for preventing racking and fracturing of the bed under torsional strains. The inclined wall portions extended from the way portions of the bed to this longitudinally arranged trough wall are in the proper alignment for functioning as struts or braces against those work thrusts tending to collapse or sway the side walls 13 of the bed outwardly or inwardly, whereas the heavy side walls of the lathe bed accommodate for the direct vertical strains and the weight of the operative parts. It will be seen that these inclined walls also function for generally bracing the structure of the lathe bed throughout its length, and, therefore, aid in resisting torsional strains also.

- It is preferable to remove the clips accumulating in the receptacle or trough automatically and by power. In this instance a conveyor device 17 has been incorporated in the longitudinal reinforcing or trough wall, the conveyor being in the form of a spiral or screw formed of plate 18 coiled and secured about a central shaft 19 and mounted for rotation within the semicircular trough wall. The shaft of the spiral conveyor is journaled at its respective ends in brackets 20, 21, mounted in the frame, one of these brackets, namely 20, being bolted to the end of the lathe and the other being included as a part of a transmission housing 22 supported on the lathe bed at the other end of the lathe.

- The spiral conveyor is rotated to move the chips and accumulated debris toward the first mentioned end of the lathe, this end including a discharge opening 23. Figure 2 illustrates the power transmission for the conveyor, a worm wheel 24 being mounted on the shaft of the spiral conveyor, within the transmission housing and meshed with a worm 25 mounted thereabove. The worm 25 is pinned to a motor shaft extension 26 extending into the transmission housing through a side wall of the lathe bed. This shaft extension 26 is coupled to the stub shaft 27 of an electric motor 28 mounted at the side of the lathe bed on a motor bracket 29.

- A modified form of receptacle, more in the nature of a grease, oil or chip pan, may be included where the integrality strengthening feature is not needed. In this form, which is illustrated in Figures 4 and 5, the general structure is the same as in the preceding form, with

the exception of the construction and mounting of the trough and deflecting or directing walls relative to the bed and its cross ribs.

A semicircular trough of sheet metal 30 is arranged in the same general manner as the cast trough but is supported through the cross ribs of the lathe bed within openings 31 formed therein. The side walls of the sheet metal trough are extended upwardly vertically a short distance as at 32 and are connected to the way portions of the lathe bed by sheet metal walls 33 either as separate pieces from the trough or integral therewith, these walls being inclined in the same manner as the case walls previously set forth.

The operation of the spiral conveyor in either form may be intermittent and only at particular times desired or may be continuous depending on the rapidity of the deposit in the trough. The same type of conveyor device may be used in the latter form as in the former, it being apparent, however, that the features of additional strength and the rigidity for the lathe bed are not present in the use of the sheet metal trough.

The septums or cross walls may include internal longitudinally disposed curved support walls 34 beneath the trough joined to the upper wall of the septum and fitting the underside of the trough for supporting the sheet metal trough entirely throughout the width of the double wall septums. To aid in the passage of chips, etc., to the trough the upper surfaces of the ribs or septums are curved or rounded for shedding the particles therefrom into the trough.

It will be apparent from the foregoing description that the trough cast within the lathe bed has a dual function whereby it not only receives and collects the debris, chips and oil from the ways, carriage, and tools of the lathe but braces the general construction of the bed in conjunction with the cross ribs and the connecting or chip directing walls.

In Figures 6 to 10 inclusive, a modified type of chip conveying and discharging means 35 is illustrated and in conjunction therewith the lathe bed indicated at 36 is modified. This modified conveying and discharging means 35 is of the endless conveyor type. The conveyor includes operating chains 37, 37 engaged over respective sprocket wheels 38 mounted on a lathe bed, there being a chain at each side of the conveyor for supporting the chip receiving sections 39 of the conveyor and two sprocket wheels 38 at each end of the conveyor.

The sprocket wheels 38 at the inner end of the conveyor are mounted for rotation between the walls 40 of the lathe bed on a shaft 41 journaled within bosses 42 of the bed. The conveyor moves longitudinally of the lathe bed, its upper run being the receiving run. The drive for the conveyor is accomplished through the sprocket wheels 38 at the outwardly extended end of the conveyor.

These latter sprocket wheels 38 have their shaft 43 mounted in bearing brackets 44 secured against the end of the lathe bed, the shaft 43 being the power shaft. This shaft 43 has attached thereto the worm wheel 45 of a driving transmission, the worm wheel being disposed within a housing 46 supporting the extended end of the shaft and driven by means of a worm 47 fixed to the motor shaft 48 of the motor 49. The housing is mounted on an extension 50 of a motor bracket 51. The motor 48 is disposed at the side of the lathe bed.

The upper run of the conveyor is mounted

within and passes through a channel or trough 52 formed by a longitudinal wall 53 formed between and beneath the ways 54 of the lathe bed. This channel has a flat bottom 55 and its wall includes side portions 56 extended at angles downwardly and inwardly from the way portions of the bed. In addition to this longitudinally disposed wall forming channel, the lathe bed is additionally reinforced by means of cross ribs 57 grouped in pairs along its length.

The sprocket chains of the conveyor include rollers 58 which ride upon the bottom of the channel (see Figure 8), whereby the conveyor is supported during passage through the channel beneath the mechanisms of the lathe. Support is also provided for the lower runs of the chamber conveyor (see Figure 8). For this purpose the lower run of the conveyor moves through slots 59 cut in the lower edges of the cross ribs and longitudinally disposed plate strips or ways 60 are secured to the under sides of the cross ribs and extend across the slot a sufficient distance to underlie and support the rollers of the chains.

The conveyor body is made up of a series of overlapping sections 39 for flexibility, there being a section mounted between each of the adjacent links of the respective chains. These sections are formed of plate material having side flanges 61 which overlap as well as the main or bottom portions of the sections.

The sections 39 are supported on laterally inwardly extended lugs 62 of the chain links. As detailed in Figure 10, each section, therefore, moves as a fixed part of adjacent chain links and the sections roll about the sprockets on their overlapped joints. The upturned side flanges of the sections prevent lateral displacement of the chips etc., deposited into the upper run of the conveyor.

For positively directing the chips into the conveyor, a chip directing pan 63 lies upon the inclined wall portions of the longitudinally formed channel. The walls of the chip directing plate or pan are inclined downwardly and inwardly and extend to points over the conveyor and within the side walls thereof.

Both ends of the channel 52 are open and the channel portion is extended to include the entire region below the carriage travel and approximately the entire length of the lathe with the exception of a portion under the headstock. The bottom surface of the channel at the inner end is rounded off as at 64 to permit easy rolling movement of the chain rollers into the channel. Any chip receiving device may be provided at the discharge end of the conveyor.

Having described our invention, we claim:

1. In a lathe, a lathe body including spaced apart longitudinal ways, said body having side walls and cross ribs joining said side walls, a trough of semi-cylindrical form mounted longitudinally of the lathe body and through the cross ribs, a spiral conveyor mounted within said trough, chip directing walls extended between the ways and the trough for directing the chips falling from the ways into the trough, and means for driving said spiral conveyor.

2. In a lathe, a lathe body including ways, said body having side walls and transverse ribs connecting said side walls, a trough of semi-cylindrical form mounted longitudinally of the lathe body and through the transverse ribs, and chip directing walls extended between the ways and the trough for directing the chips falling from the ways into the trough.

3. In a lathe, a lathe bed including spaced apart parallel longitudinal ways, said body having side walls and transverse ribs connecting said side walls, a trough mounted longitudinally of the lathe bed to an end thereof and through the cross ribs, a conveyor mounted within said trough, chip directing walls extended between the ways and the trough for directing the chips falling from the ways into the trough, means for driving said conveyor, and said lathe bed having a discharge port at the end to which the trough extends whereby said conveyor moves the chips to the end of the trough and through the discharge port.

4. In a lathe, an integral lathe bed including side walls, slideways formed along said side walls, cross ribs joining the side walls, and a semi-cylindrical longitudinally disposed central portion joining the cross ribs and connected to the side walls by inclined walls.

5. In a lathe, a lathe bed including side walls, slideways formed along said side walls, hollow struts joining the side walls, said struts having rounded upper surfaces, and a semi-cylindrical longitudinally disposed central portion joining the struts and connected to the side walls, said central semi-cylindrical portion open at its upper side for receiving the chips from the work and slideways.

6. In a lathe, a lathe bed including side walls, slideways formed along said side walls, hollow struts joining said side walls, and a hollow longitudinally disposed central receptacle portion joining the cross ribs and connected to the side walls whereby the chips and lubricant falling from the slideways and work are deposited in said receptacle.

7. In a lathe, a bed including ways, a wall disposed within the bed between and below the ways thereof, said wall forming a longitudinally disposed channel, a conveyor device movable through the channel, and a chip directing element mounted over the channel for directing the chips into the conveyor device.

8. In a lathe, a bed including spaced ways, a wall within the lathe bed disposed between and beneath the ways and forming a longitudinally disposed channel, an endless conveyor device mounted in the lathe bed and having its upper run passing through the channel and supported therein, and means for directing the chips into the conveyor device.

9. In a lathe bed including ways, a wall within the lathe bed forming a channel between and beneath the ways extended longitudinally of the lathe bed, an endless conveyor having its upper run passing through the channel and supported therein, means for driving the endless conveyor, said endless conveyor including side flanges, and chip directing means supported beneath the ways for directing the chips into the endless conveyor, said chip directing device extended for directing the chips within the side flanges of the endless conveyor.

10. In a lathe, a lathe bed including ways, a longitudinally disposed wall formed within the lathe providing a longitudinally disposed channel, cross ribs joining the side wall of the lathe bed, and inclined walls connecting the channel wall and the way portions of the lathe bed.

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