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ADJUSTABLE BEARING MEANS AND LUBRICATION SYSTEM
FOR RECIPROCATING GANG SAWS
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Fig. 2

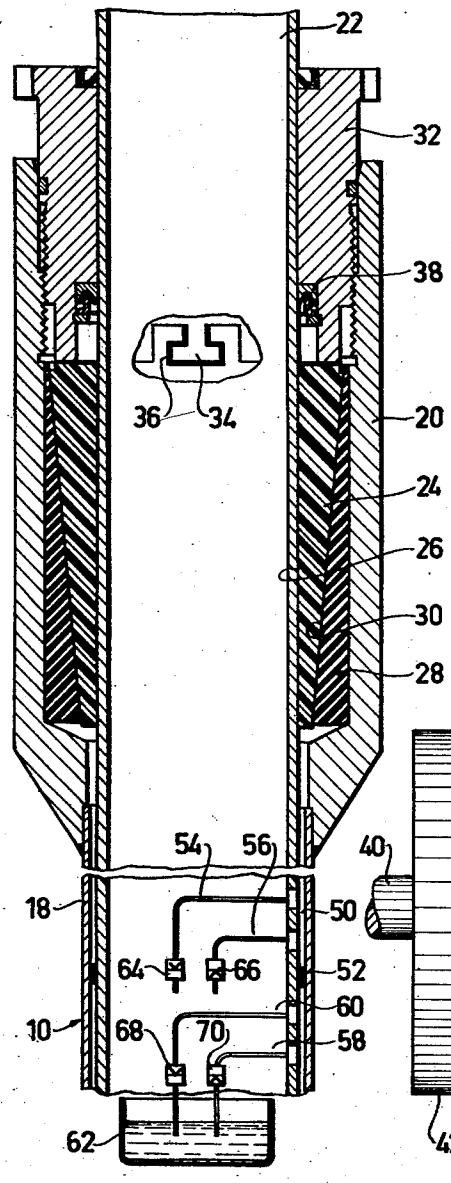
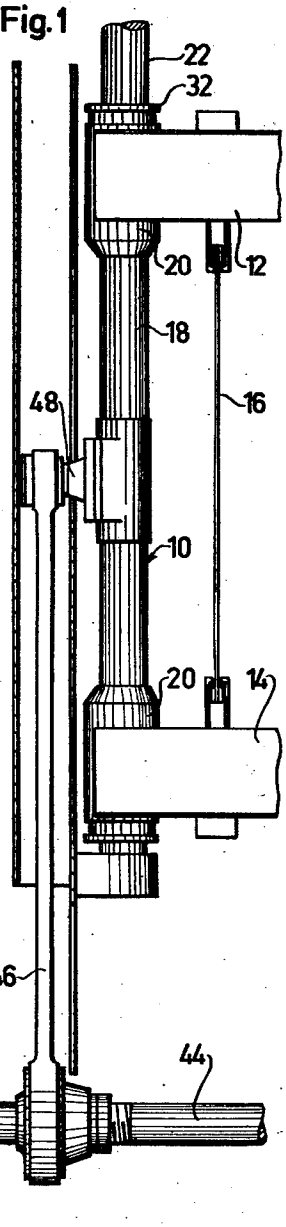


Fig. 1



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ADJUSTABLE BEARING MEANS AND LUBRICATION SYSTEM FOR RECIPROCATING GANG SAWS

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2 Claims. (Cl. 143—60)

This invention relates to a gang saw for lengthwise sawing of timber logs.

More particularly this invention relates to a gang saw for lengthwise sawing of timber logs comprising a stationary frame and a sash composed of an upper and a lower cross beam interconnected by hollow posts adapted to reciprocate upwards and downwards within said frame. The saw blades are fixed to said cross beams under a high pre-stress. The reciprocating movement of the heavy sash in combination with the load acting on said sash during the sawing operation causes intricate bearing problems. In spite of the present day tendency to increase the speed of the sash the old original bearing construction comprising guides provided in the stationary frame and disposed to cooperate with sliding blocks made of pockwood or some similar hardwood quality, is still used in substantially the same form. This bearing construction inherently possesses several serious disadvantages, among which the difficult adjustment of the sliding blocks in accordance with their individual wear may be mentioned. The lubricant film between the sliding surfaces will become thin and of locally varying thickness. In order to avoid overheating by dry or half-dry friction, it has been necessary to employ water cooling.

One main object of the invention is to eliminate these disadvantages by providing an improved bearing construction for the sash.

A further object of the invention is to provide an improved bearing construction for the sash permitting an exact adjustment thereof in an easy and rapid manner.

Still a further object of the invention is to provide an improved bearing construction for the sash permitting a reliable lubrication thereof by means of a suitable lubricant, in the first instance oil.

Further objects and advantages of the invention will be apparent from the following description considered in connection with the accompanying drawing which forms part of this specification and of which:

Fig. 1 is a partly sectional elevation of a part of a gang saw comprising a reciprocatable sash.

Fig. 2 is a longitudinal sectional view of portions of a tubular post and a column forming part of the gang saw part illustrated in Fig. 1 though represented in a larger scale than in said Fig. 1.

Referring to the drawing, Fig. 1 shows a post **10** of a sash and a portion each of an upper and a lower cross beam denoted by **12** and **14**, respectively. Saw blades **16** of which one is represented in the figure, are fixed between said cross beams under a pre-stress which may amount to many tons for each blade. Each post **10** comprises a tubular member **18** both ends of which carry a bearing sleeve **20** rigidly secured to the member **18**. The cross beams **12** and **14** are rigidly secured to the bearing sleeves. Each post **10** is slidably mounted concentrically around a cylindrical column **22** rigidly secured to the stationary frame of the gang saw. Disposed within the bearing sleeves **20** are bushes **24** having an inner cylindrical surface **26** slidably engaging an outer cylindrical surface of

the column **22**, the bushes **24** on their external faces tapering conically in a direction towards the center of the tubular member **18**. According to a preferred embodiment of the invention the bearing sleeve **20** houses an annular bearing member **28** having an internal conically tapering surface **30** shaped so as to fit to the outer surface of the bushes **24** and thus have a diminishing diameter in a direction towards the center of the post **10**. The bushes **24** are made of a suitable bearing material such as textile-reinforced thermosetting artificial resins, the bearing member **28** being made of a suitable elastic material such as rubber, for example.

The free end of the bearing sleeve **20** is threadedly engaged by an adjusting nut **32** provided with two suitably T-shaped projections **34** each of which enters a recess **36** in one of the bushes **24**. By turning the adjusting nut **32** the bushes are moved axially. Due to the conical surface **30** the bushes are contacted toward the surface of column **22** by screwing down the nut. The nut **32** encloses a sealing member **38** which in a known manner may comprise a double-flapped collar the flaps of which abut against the nut **32** and the column **22**, respectively.

The sash is reciprocated in a substantially vertical direction by a motor (not shown) through a shaft **40**. A crank **42**, a crank pin **44** and two connecting rods **46** mounted on crank pin **44** and each rod individually on a wrist pin **48** rigidly secured to the posts **10** adjacent the center part thereof.

Between the post **10** and the column **22** an annular interspace **50** is formed, this interspace extending between the upper and the lower annular bearing and being filled with oil. The oil enclosed within this interspace is prevented by the sealing members **38** from escaping by leakage from the bearings, the sliding surfaces of which thus operate within an oil-bath providing oil films on the bearing surfaces to absorb the load created between said surfaces. Adjustment of the bushes to compensate for wear may be effected in a simple way by screwing down the nut **32** by a quarter of a turn, for example. In this way a subsequent distribution of the load on various portions of the circumference of the bushes **24** is attained and wear on the circular surfaces so as to deform them to an oval shape is avoided. Due to the high pre-stress of the saw blades some bending of the posts **10** is unavoidable, but the annular bearing members by their elasticity ensure maintenance of parallelism between the sliding surfaces.

The oil enclosed between the post and the column follows the post in its reciprocating movement. It is preferred to dispose an annular member **52** around the column **22** which does not project into contact with the tubular member **18** but forms a reduced passage or throttling space adjacent the column. The annular member **52** is positioned near the center portion of the post **10** when the post has performed half a stroke of its reciprocating movement. From either side of the annular member **52** conduits **54**, **56** and **58**, **60**, respectively, form communications with an oil pan **62**. Check valves **64**, **66**, **68** and **70**, respectively, are provided in the conduits. By the sash moving downwards the portion of the interspace **50** above the annular throttle member **52** is reduced in volume. Oil will be forced through the conduit **56** to the pan **62**, since the valve **66** permits flow to said pan. At the same time the portion of the interspace **50** below said throttle member is enlarged as to its volume and causes oil to be sucked from the pan **62** through the conduit **60** into the lower portion of such interspace. During the movement of the sash in the opposite direction the valves **64** and **70** open and cause oil to be sucked through the conduit **54** into the portion of the interspace **50** above the annular throttle member

and to be forced out of the portion below such member. From the system only diagrammatically illustrated in the drawing it is evident that the movement of the sash can be utilized for effecting circulation of the lubricant oil for the purpose of cooling the same, for example.

The closed circulation system located between the post and the column may also be connected to an air chamber intended to accumulate the kinetic energy produced by the movements of the sash by compressing air when the sash is retarded at the end of a stroke in order to deliver such compressed air during the next following period of acceleration in the subsequent stroke.

While one more or less specific embodiment of the invention has been shown and described, it is to be understood that this is for the purpose of illustration only and that the invention is not limited thereby, but its scope is to be determined by the appended claims.

What I claim is:

1. In a reciprocating gang saw a frame, spaced parallel cylindrical columns mounted on said frame, a new sash comprising spaced parallel beams, a plurality of saw blades fixed to said beams and extending therebetween, spaced parallel tubular cylindrical posts connecting said beams, said posts being slidably received on said columns in concentric spaced relation thereto and a bearing assembly adjacent each end of each post, said bearing assembly comprising a bearing sleeve secured to said post and extending axially therefrom to provide an elongated annular recess between the outer surface of said column and the inner surface of said bearing sleeve, a sleeve fixed in said annular recess and having an outwardly tapered bore, a correspondingly externally tapered compressible bushing disposed in said annular recess within, and in engagement with, said tapered bore of the sleeve and having a cylindrical inner surface slidably engaging said column, a bushing adjusting nut threadedly received in the outer end of said bearing sleeve and engaging said bushing for moving the same axially to compensate for wear and fluid seal means between said nut and said column, a constriction in the space between said column and said post substantially midway of the length thereof, inlet and outlet conduits connected to the space on each side of said restriction respectively, and to a reservoir of lubricating fluid, check valves in said inlet and outlet conduits and means to reciprocate said sash and posts on said columns whereby the space on each side of said restriction is expanded and contracted to provide a pumping action to draw lubricating fluid from said reservoir to said space and return the fluid to the reservoir.

2. In a reciprocating gang saw a frame, spaced parallel cylindrical columns mounted on said frame, a saw sash comprising spaced parallel beams, a plurality of saw blades fixed to said beams and extending therebetween, spaced parallel tubular cylindrical posts connecting said beams, said posts being slidably received on said columns in concentric spaced relation thereto and a bearing assembly adjacent each end of each post, said bearing assembly comprising a bearing sleeve secured to said post and extending axially therefrom to provide an elongated annular recess between the outer surface of said column and the inner surface of said bearing sleeve, a sleeve fixed in said annular recess and having a tapered bore, a correspondingly externally tapered compressible bushing disposed in said annular recess within, and in engagement with, said tapered bore of the sleeve and having a cylindrical inner surface slidably engaging said column, a bushing adjusting nut threadedly received in the outer end of said bearing sleeve and engaging said bushing for moving the same axially to compensate for wear and fluid seal means between said nut and said column, a constriction in the space between said column and said post, inlet and outlet conduits connected to the space on each side of said restriction respectively and to a reservoir of lubricating fluid, check valves in said inlet and outlet conduits and means to reciprocate said sash and posts on said columns whereby the space on each side of said restriction is expanded and contracted to provide a pumping action to draw lubricating fluid from said reservoir to said space and return the fluid to the reservoir.

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