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Mathiesen

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[54] **CHAIN-SAW EXTENSION POLE**

[76] Inventor: **Robert G. Mathiesen,** 2200 Canehill Avenue, Long Beach, Calif.

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[52] **U.S. Cl.** .....**143/32 L,** 30/167
[51] **Int. Cl.**.....**B27b 17/02,** A01g 3/08
[58] **Field of Search** .....143/32 R, 32 K, 32 L, 143/43 B; 30/167, 296

[56] **References Cited**

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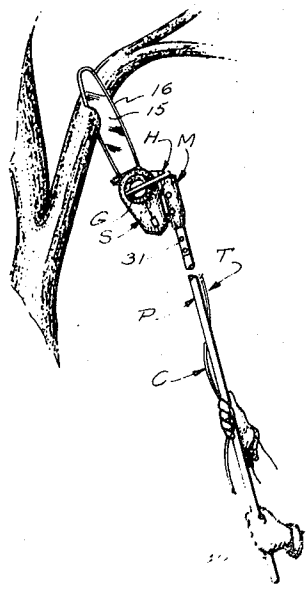
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Primary Examiner—Donald R. Sohran
Attorney—Georges A. Maxwell

[57] **ABSTRACT**

An extension pole for a chain saw with an elongate handle with front and rear ends and occurring in a common vertical plane with the center of gravity of the saw and an axis concentric with the designed longitudinal axis of rotation for the saw, said pole having mounting means releasably engageable with the saw handle with the axis of the pole substantially concentric with and projecting rearwardly from the handle. Manually operable throttle control means carried by the mounting means to engage a throttle trigger carried by the handling and including an operating line extending longitudinally of the pole. The mounting means engaging only the handle of the saw and being releasably secured with the saw without engagement of fasteners in and with the saw structure.

6 Claims, 8 Drawing Figures



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Fig. 1.

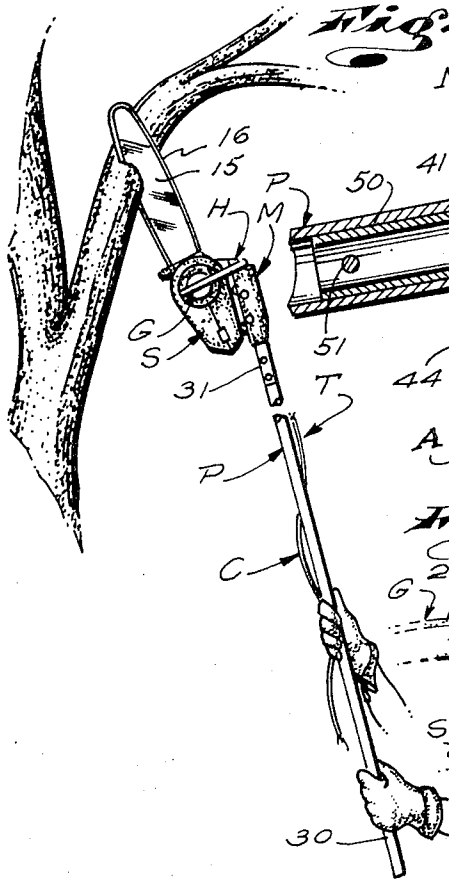


Fig. 2.

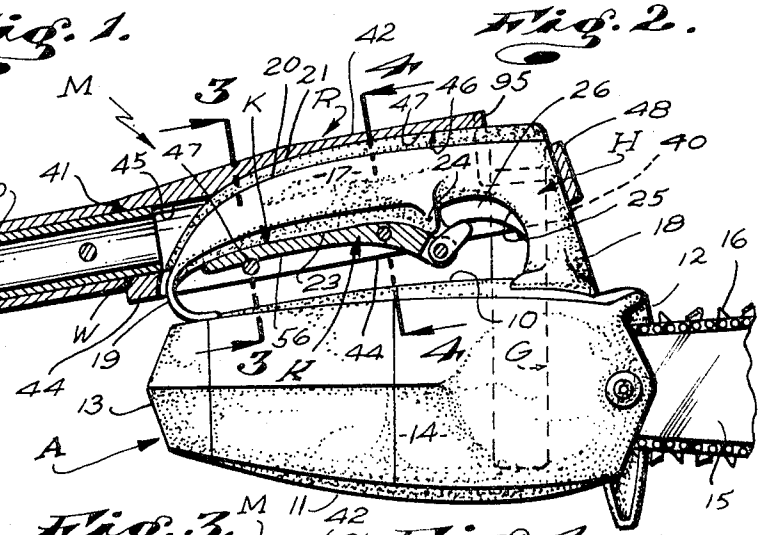


Fig. 3.

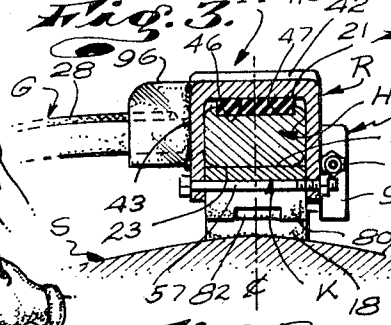


Fig. 4.

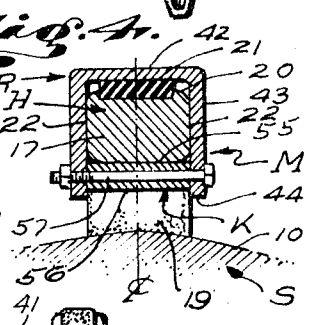


Fig. 7.

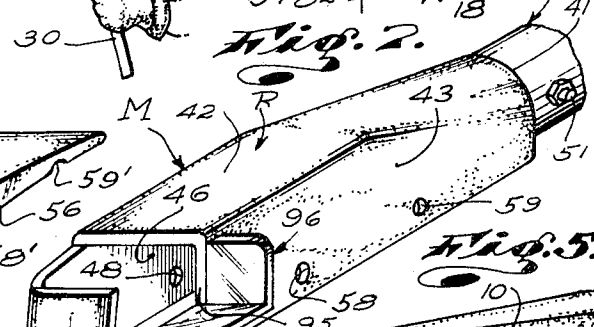


Fig. 6.

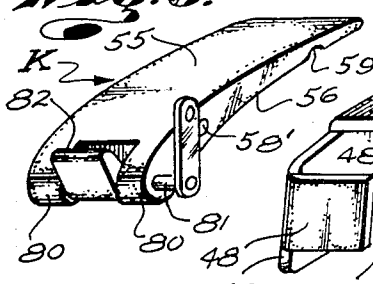


Fig. 5.

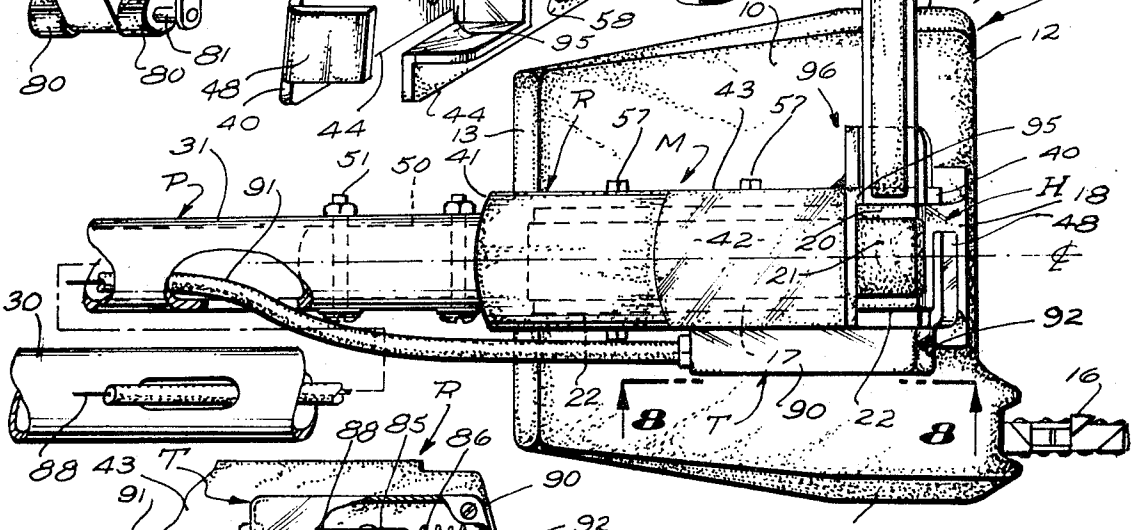
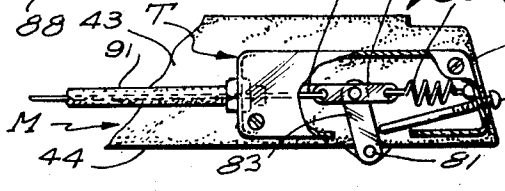


Fig. 8.



CHAIN-SAW EXTENSION POLE

This invention relates to a tree trimming saw extension and is more particularly concerned with a novel extension pole and control means for motor driven chain saws.

It has long been a regular and common practice to trim trees to enhance their appearance and well being, as well as to protect them from causing damage or from being damaged by adjacent and surrounding objects.

While reference is here made to trees, it is to be understood that the term "trees" is meant to include any other tall, tree-like vegetation.

In the past, the branches in the upper reaches of trees, above the normal reach of man, have been cut off for trimming purposes by means of manually operable saws, manually operable shearing tools, commonly referred to as loppers, and the like.

In recent years and with the advent of the motor driven chain saw, such saws have, whenever possible, been employed to cut or saw off the larger branches of trees, with resultant saving of much time and effort.

While the use of chain saws is extremely desirable to cut the larger branches of trees, it has not been safe or practical to use such saws to cut branches which are out of the normal reach of man.

In order to use the ordinary chain saw, it must be held directly in the hands of the operator. In order to use such a saw to cut the branches in trees which are beyond the normal reach of the operator and the saw, it is necessary that the operator climb the trees, with the saw or that a ladder or like supporting structure be provided, and engaged on or with the tree and up which the operator can effectively climb, with the saw, in order to be placed within effective reach of the branch or branches to be cut.

Use of a chain saw is particularly desirable when large branches of a tree are to be cut off. The cutting off of large branches on trees creates most hazardous conditions as the weight of such branches frequently causes splitting of the branches before they have been fully severed. Further, when large branches are severed, the change in balance and mass of the tree causes the tree to move violently. Still further, as a large branch, cut from a tree, drops, it has a potential of severely damaging and/or injuring anything that is in close proximity to it.

As a result of the above, and in view of certain inherent dangers encountered in the use of chain saws, the use of chain saws to trim the branches in the upper reaches of trees is considered to be extra hazardous and is not practiced except by the unweary or the foolhardy.

The use of a ladder in the course of trimming trees is time consuming, is risky and is such that the use of ladders or the like is avoided whenever possible.

An object of this invention is to provide an extension pole for a chain saw whereby an operator, standing on the ground, beneath a tree, can safely and effectively direct and move the related chain saw into the upper reaches of the tree to cut desired branches and effect trimming of the tree.

The ordinary chain saw comprises a housing in which a small gasoline engine is arranged, an elongate blade projecting forwardly from the housing and about which a chain with cutters is engaged and guided, a hand grip on the housing and a throttle trigger for the engine related to the handle. The handle of such saws is arranged and disposed in predetermined relationship with the housing, the axis of the blade and the center of gravity of the saw so that the saw can be most easily, conveniently and safely handled and manipulated by the operator thereof.

In practice, the handle of such saws occurs or is accessible at the top or upper side of the housing and occurs in a vertical, fore and aft plane parallel with the axis of the blade of the saw and intersecting the center of gravity of the saw. The handle is essentially an inverted U-shaped member with a substantial horizontal hand grip portion in spaced relationship above the housing and having front and rear leg portions depending from the ends of the grip portion to join and/or connect with the housing. The hand grip portion of the handle is suitably contoured to provide comfortable gripping thereof by the operator and has the throttle trigger arranged at its lower forward portion for convenient engagement by the index finger of the hand of the operator which is engaged about the handle.

The hand grip portion of the handle is placed above the center of gravity of the saw a limited predetermined distance so that the saw, when gripped and supported by means of the handle tends to remain in its normal vertical plane, but the handle is not so far removed from the center or gravity of the saw that the movement of force between the center of gravity and the handle is so great that the saw cannot be easily and conveniently tipped, turned or rotated laterally relative to its fore and aft axis.

The placement and the arrangement of the handle of chain saws, as set forth above, is substantially imperative for the establishment and provision of a saw which is relatively safe and convenient to handle and manipulate and is common in substantially all modern chain saws.

The fore and aft placement of the handles of such saws varies according to the make or brand of saw.

In addition to the above, chain saws further include upwardly projecting, laterally extending, secondary handles or hand grips, at or adjacent the forward end of the first mentioned or primary handles and projecting laterally, to the left hand side of the primary handles.

Those chain saws provided by the prior art, which are suitable for trimming branches on the upper reaches of trees are small light weight units and are provided with light weight housings, established of thin sheet metal and/or thin walled aluminum castings and the like. The housings are of a nature that they do not provide structurally sound means to which a mounting means for an extension pole or the like can be satisfactorily secured. To the best of my knowledge, all attempts by the prior art to fix an extension pole to a chain saw have involved securing the poles to the motor or engine housings of the saw and have sought to leave the handles, particularly the primary handle, free and unobstructed so that the throttle trigger related thereto is freely accessible and such that it can be engaged by a separate and distinct remotely operated throttle control means. As a result of the above, the saws have been improperly balanced at the ends of the extension poles and the mountings between the poles and the saws have, as a result of the inherent weaknesses of the engine housings, been weak and unsafe.

The only, truly, rigid and stable means provided to engage and support the ordinary chain saw is the handles which are specifically designed and provided for that purpose.

An object and feature of my invention is to provide an improved extension pole for a chain saw having novel mounting means to cooperatively engage the handles of the saw whereby the saw is secured to the end of the pole in proper alignment and balanced position.

It is an object and feature of the present invention to provide a novel chain saw handle mounting means at the end of an extension pole, which means cooperatively and securely engages and embraces a chain saw handle without requiring modofication of the saw structure in any way and specifically, without requiring the engagement of screw fasteners or the like in the saw structure.

Yet another object and feature of my invention is to provide a mounting means of the character referred to which is such that it engages only the handles of the saw with which it is related and does not engage or otherwise adversely bear against the soft and fragile parts of the saw construction, such as the engine housing.

Still another object and feature of my invention is to provide a structure of the character referred to wherein the mounting means secures the extension pole to the primary handle of a related chain saw with the axis of the pole in alignment with the mean central, fore and aft axis of the handle.

It is an object and feature of the present invention to provide a structure of the character referred to having novel throttle trigger operating means.

Another object and feature of the present invention is to provide a structure of the character referred to which is such that it can be easily, quickly and conveniently engaged with and removed from a related chain saw.

Finally, it is an object of the invention to provide a structure of the character referred to which is easy and economical to make and manufacture and a structure which is highly effective and dependable in operation and which is convenient and safe to use.

The foregoing and other objects and features of my invention will be fully understood and will become apparent for the following detailed description of typical preferred form and application of my invention, throughout which description reference is made to the accompanying drawings, in which:

FIG. 1 is a view showing my invention in use;

FIG. 2 is a sectional view of a portion of my invention, showing it related to a saw;

FIG. 3 is a sectional view taken as indicated by line 3—3 on FIG. 2;

FIG. 4 is a sectional view taken as indicated by line 4—4 on FIG. 2;

FIG. 5 is a view taken as indicated by line 5—5 of FIG. 2;

FIG. 6 is an isometric view of a portion of the invention;

FIG. 7 is a view of another portion of the invention; and

FIG. 8 is a view taken substantially as indicated by line 8—8 on FIG. 3.

Throughout the drawings, I have shown the invention related to a typical motor driven chain saw S. The saw S illustrated is similar to that make of chain saw produced by McCulloch Corporation of Los Angeles, Cal., and bearing the model number PM–6 Automatic.

The saw S includes an attractively contoured box-like housing A with a substantially flat top **10**, bottom **11**, front **12**, rear **13** and sides **14**, and in which an engine or prime mover (not shown) is arranged.

Projecting forwardly from the front **12** of the housing, at the right hand side thereof is an elongate, flat, vertical blade **15** about which the cutting chain **16** of the saw is engaged.

A handle H is provided for the saw, which handle has a central, elongate, substantially horizontal grip portion **17** extending fore and aft, in spaced parallel relationship above the top **10** of the housing and has downwardly extending front and rear leg portions **18** and **19** joined and connected with the top **10** of the housing.

The handle H is spaced laterally from the blade **15**, toward the central portion of the housing and occurs on a vertical, longitudinal plane which intersects the center of gravity of the saw structure.

The grip portion **17** of the handle H has a convexly curved upper longitudinal upper or top edge **20** which edge can, as shown, be provided with a longitudinally extending rubber shock absorbing trim strip **21**. The grip portion **17** is further characterized by laterally oppositely disposed sides **22** and a contoured bottom edge **23**, which is slightly concavely curved relative to the longitudinal axis of the grip portion and which terminates at its forward end at a downwardly projecting finger engaging stop projection **24**. Forward of the projection **24** is a downwardly and substantially rearwardly opening curved trigger recess **25** in which a finger engaging throttle trigger **26**, for the saw engine, is arranged. The trigger **26** is an elongate plate like part on the central, vertical, longitudinal plane of the handle; has a lower edge which occurs in spaced relationship below and/or inward of the recess **25** and is such that its rear end portion, at the forward side of the projection **24**, when engaged and urged vertically, effects and controls the operating speed of the saw engine.

In addition to the foregoing, the saw S is provided with a secondary hand grip G, which grip projects laterally outward from the forward left hand side of the grip portion **17** of the handle H and thence downwardly and then laterally inwardly to join or connect with the lower forward portion of the left side **14** of the housing A. The grip G, like the handle H is shown provided with a decorative, shock absorbing, rubber trim strip **28** extending about its outer side.

The saw construction illustrated and described above, is the most common and popular type and/or style of saw construction in use today, and for that reason has been chosen for the purpose of disclosing the present invention. In practice, other saws of the same general class as that illustrated vary considerably in appearance and in minor structural details, but each has a handle, which is similar in general form, nature and arrangement as is the handle H of the saw S.

The saw S, further includes a starter cord, on and off switch, gas tank filler cap and the like, which elements, parts and/or means have not been shown as they in no way affect the operation and/or the novelty of the invention.

The present invention involves generally, an elongate, manually engageable pole P with inner and outer end portions 30 and 31, saw handle engaging mounting means M at the outer end of the pole and throttle control means T.

The pole P is a straight, elongate, member of desired longitudinal extent and can be established of wood or metal tubing. It can be a unitary part or can be made up of two or more sections releasably secured together, in aligned, end to end relationship by any one of those several well-known means employed to secure the ends of poles together.

The mounting means M includes a receiver R and a keeper plate K.

The receiver R is an elongate unitary part having front and rear ends 40 and 41, a substantially flat horizontal top 42, substantially flat vertical sides 43 and a bottom 44. The rear end 41 has a central, rearwardly opening bore 45 which bore cooperatively receives a part of the means provided to connect the receiver to the pole P and has a downwardly and forwardly opening handle receiving recess 46. The recess 46 has a curved top and rear surface 47 corresponding in configuration with the upwardly and rearwardly disposed top surface 20 of the hand grip portion of the handle H and laterally inwardly disposed, opposing side surfaces adapted to slidably engage the opposite sides 17 of the handle H. The sides of the receiver establish skirt-like portions which depend below the bottom side 23 of the hand grip.

In the case illustrated, the top surface 47 of the recess 46 is shaped to conform with the rubber strip 21, which strip projects upwardly and outwardly of the top surface 20 of the handle.

In practice, and as shown in the drawings, the forward ends of the sides of the receiver terminate adjacent the front side of the front legs 18 of the handle and one side of the carrier carries a laterally inwardly projecting retaining flange 48, which flange overlies and engages the front surface of the leg 18 and in such a manner as to hold the handle back and seated in the recess and prevents the handle from shifting forwardly and out of engagement in the recess. The retaining flange 48 is not wholly necessary, but is desirable in that it adds to the effectiveness in which the handle H is engaged and secured.

The axis of the bore 45 is substantially concentric with the mean longitudinal axis of the grip portion of the handle H whereby the axis of the pole P is substantially concentric with the engineered and designed axis and center of support for the saw.

The carrier next includes a tubular mounting sleeve 50 slidably engaged in the bore 45 and projecting rearwardly from the carrier. The sleeve 50 is preferably fixed in the bore as by welding W and is adapted to slidably receive the outer end portion of the pole P or, as shown, to be slidably engaged in the outer open end of the tubular pole.

The pole is fixed on the sleeve against axial displacement and against relative rotation of a pair of longitudinally spaced screw fasteners 51 engaged through the pole and the sleeve, as clearly illustrated in FIGS. 2 and 5 of the drawings.

The keeper plate K is an elongate substantially flat, horizontal plate-like part corresponding in lateral extent with the recess 46 and having a top surface 55 corresponding in longitudinal configuration or curvature with the bottom side 23 of the hand grip portion 17. The keeper plate K is slidably engaged in the recess and into stopped engagement with the handle. The forward end of the keeper plate K is shaped to establish stopped engagement with the rear side of the stop projection 24 of the grip portion of the handle.

The keeper plate has a substantially flat bottom surface 56, the major portion of which occurs in a plane spaced above the bottom 44 of the receiver that is, above the lower edges of the sides of said receiver.

The structure next includes a pair of longitudinally spaced, transversely extending, elongate, horizontal screw fastening means 57, which means are engaged through the lower portion of the receiver to bridge the recess 46 and to engage and hold the keeper plate K in tight clamped engagement with the handle.

In the case illustrated, the foremost fastening means includes a headed bolt engaged through registering openings 58 in the opposite sides of the receiver and through an opening 58' in the plate K, while the rearmost fastening means 57 includes a headed bolt engaged through registering openings 59 in the sides of the receiver and which is engaged in a downwardly opening transversely extending orienting groove 59' in the bottom of the plate K. The free ends of the bolt project from a side of the receiver and have retaining nuts engaged thereon.

With the structure described above, and as clearly illustrated in the drawings, it will be apparent that the receiver R and keeper K securely engage and grip the handle H in such a manner that the handle and said receiver and keeper are held against relative axial and/or rotative movement. It will be further apparent that the pole P is fixed with the means M against movement relative thereto and so that an operator, engaging the inner end portion of the pole P has positive and secure control of the saw S at the outer end of said pole.

The throttle control means T that I provide includes a pair of laterally spaced forwardly and downwardly projecting arms 80 on the forward end of the keeper plate K, which arms project below the lower open side or bottom of the recess 46 and below the throttle trigger 26. A transversely extending shaft 81 is rotatably engaged through and between the arms 80 and has an outer free end that projects laterally outwardly below and from one side of the receiver. The shaft 81 carries a normally forwardly and upwardly projecting trigger engaging foot 82, which foot occurs between the legs and projecting therefrom to engage the lower rear end of the trigger 26, as clearly illustrated in FIG. 2 of the drawings. The outer free end of the shaft 81 carries a lever arm 83 which projects upwardly adjacent one side of the carrier. The upper end of the arm 83 is pivotally joined with a plate-like coupler part 85. The coupler 85 has a forward end connected with the rear end of a helical tension spring 86, the forward end of which spring is suitably anchored or fixed to the receiver at a point spaced forward of the lever arm. The rear end of the coupler 85 is connected with the forward end of an elongate axially shiftable control wire or cable 88, which cable extends rearwardly from the mounting means and is connected with

a flexible, manually engageable pull cord C, which extends to the hands of the operator at the inner end of the pole P, as shown in FIG. 1 of the drawings, or which, as shown in FIG. 5 of the drawings, extends through an opening in the outer end portion of the pole P, through the pole and thence outwardly through a similar opening in the inner end portion of the pole where it can be suitably manually engaged, for operating the throttle trigger 26.

In the case illustrated, the side of the receiver R with which the lever arm is related is provided with a sheet metal, cup-like housing 90, fixed to the carrier by a pair of screw fasteners. The lower side of the housing has a slot-like opening through which the lever arm projects. The forward end of the spring occurs within and is suitably fixed to the front end of the housing. The wire or cable 88 extends into and through a flexible tubular jacket 91 the forward end of which extends through the rear wall of the housing and is fixed thereto and the rear end of which extends into the opening in the forward portion of the hole P.

In practice, and as shown in the drawings, an idle adjusting screw 92 can be provided to limit forward pivoting of the lever arm and resulting downward movement of the trigger 26 whereby the idle speed of the saw can be effectively controlled.

In addition to the foregoing, and to accommodate the laterally projecting hand grip G of the particular make and style of saw illustrated, the upper, forward left hand side of the receiver R is relieved as at 95.

Further, a laterally outwardly projecting angle stop 96 is provided on the receiver, adjacent the relief 95 to engage and stop against the rear side and to engage and stop against the lower or under side of the grip G, adjacent to the handle H. The angle stop 96 can be used in place of the stop flange 48 and serves to limit and stop forward shifting of the handle in and relative to the receiver.

It will be apparent that the mounting means M can be engaged and disengaged with the saw S by the engagement and disengagement of the lever and bolt type fastening 47 between the receiver R and the keeper plate K.

It will be apparent that the interior dimensions and configuration of the recess 46 in the receiver R and the configuration of the keeper plate K can be easily changed and altered to adapt the invention for use in combination with saws of substantially different design than that shown, without departing from the spirit of this invention.

Having described only typical preferred forms and applications of my invention, I do not wish to be limited or restricted to the specific details herein set forth, but wish to reserve to myself any modifications and/or variations that may appear to those skilled in the art to which this invention pertains and which fall within the scope of the following claims.

Having described my invention, I claim:

1. In combination, a motor driven chain saw with an elongate motor housing with front and rear ends and top, bottom and side surfaces, a flat vertical chain supporting blade projecting forwardly from the front end of the housing and a handle with an elongate substantially horizontal hand grip portion in spaced relationship above the top of the housing and front and rear leg portions depending from the hand grip portion and secured to said housing, said handle occurring on a vertical plane near the center of gravity of the saw and the axis of said grip portion occurring adjacent the designed axis of axial rotation of the saw; an elongate extension pole with inner and outer ends, mounting means at the outer end of the pole and releasably engaging said handle with the pole in substantial axial alignment with the hand grip portion and projecting rearwardly from the handle.

2. A structure as set forth in claim 1 wherein said mounting means includes an elongate receiver with front and rear ends, pole engaging means at its rear end, a downwardly and forwardly opening recess with side surfaces slidably engaged with opposite sides of the handle and an upper and rear surface engaged with upper and rear surfaces of the hand grip and rear leg portions of the handle, an elongate keeper plate engaged in the recess between the side surfaces thereof and engaged with a lower surface of the hand grip portion and screw fastener means engaged in and between the carrier and the plate whereby the plate holds the handle in tight seated engagement in the recess.

3. A structure as set forth in claim 1 wherein said saw includes a throttle trigger adjacent the forward lower side of said hand grip portion and adapted to be manually engaged and urged upwardly relative to the handle to increase the operating speed of the saw, and throttle control means carried by said mounting means, said control means comprising a shaft rotatably carried by the mounting means on a horizontal transverse axis, an elongate foot having an inner end fixed to the shaft and an outer end engaging the trigger, a lever arm with an inner end fixed to the shaft, an elongate operating line extending longitudinally of the pole and having a manually engageable inner end and an outer end secured to the outer free end of the lever arm.

4. A structure as set forth in claim 2 wherein said saw includes a throttle trigger adjacent the forward lower side of said hand grip portion and adapted to be manually engaged and urged upwardly relative to the handle to increase the operating speed of the saw, and throttle control means carried by said mounting means, said control means comprising a shaft rotatably carried by the mounting means on a horizontal transverse axis, an elongate foot having an inner end fixed to the shaft and an outer end engaging the trigger, a lever arm with an inner end fixed to the shaft, an elongate operating line extending longitudinally of the pole and having a manually engageable inner end and an outer end secured to the outer free end of the lever arm.

5. A structure as set forth in claim 4 wherein said keeper plate rotatably carries the shaft.

6. A structure as set forth in claim 4 wherein said keeper plate rotatably carries the shaft, said foot projecting forwardly and upwardly to engage said trigger, said shaft projecting laterally outwardly from below the receiver at one side thereof, said lever arm projecting upwardly from the shaft adjacent said one side of the receiver spring means operatively coupled with the upper free end of the lever arm and normally yieldingly urging said free end of the lever arm forwardly.

* * * * *