Sept. 4, 1928. 1,682,774

B. C. CLUTTER

EXCAVATOR

Filed March 22, 1927 2 Sheets-Sheet 1

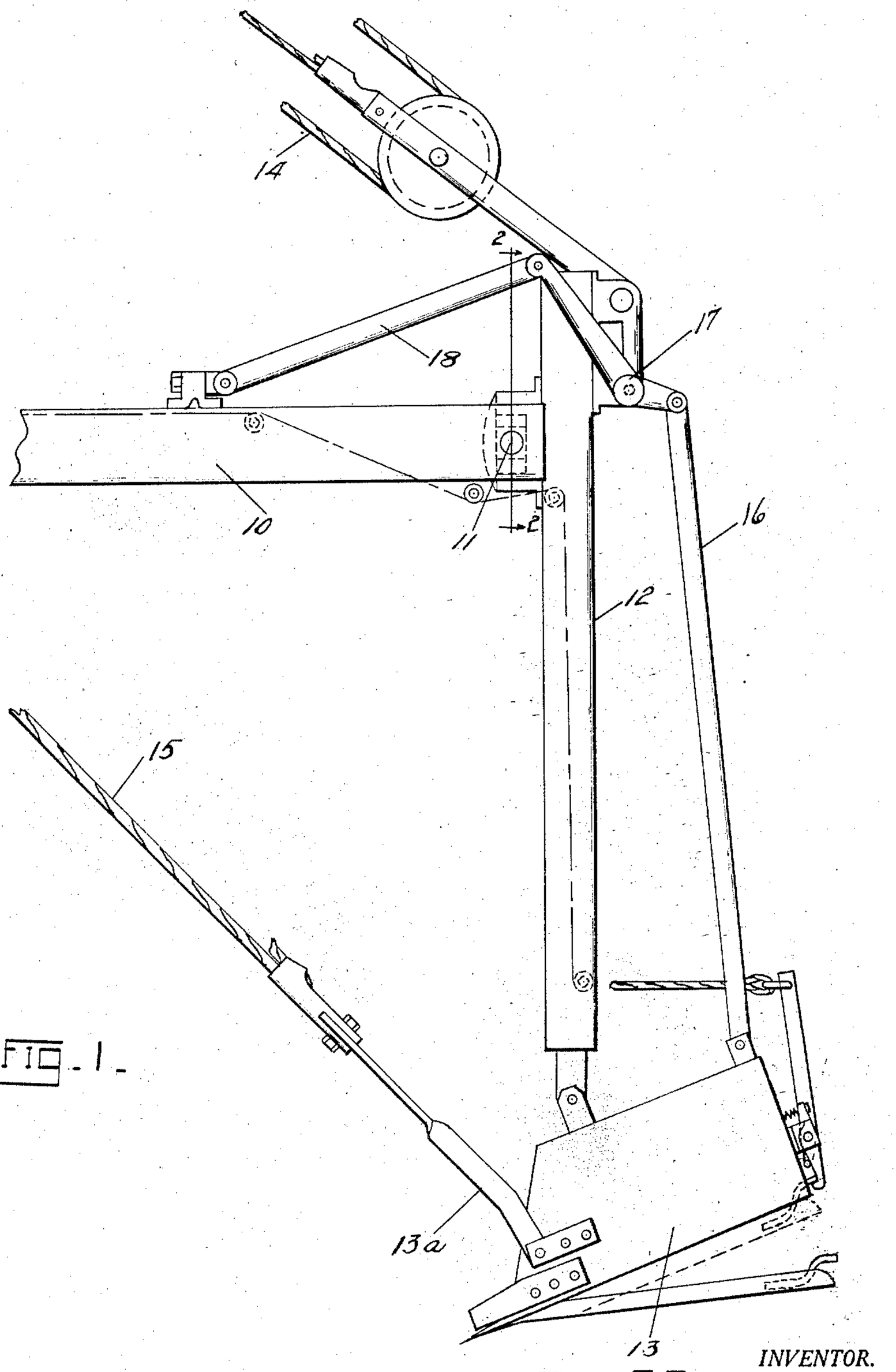

FIG. 1.

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2 Sheets-Sheet 2

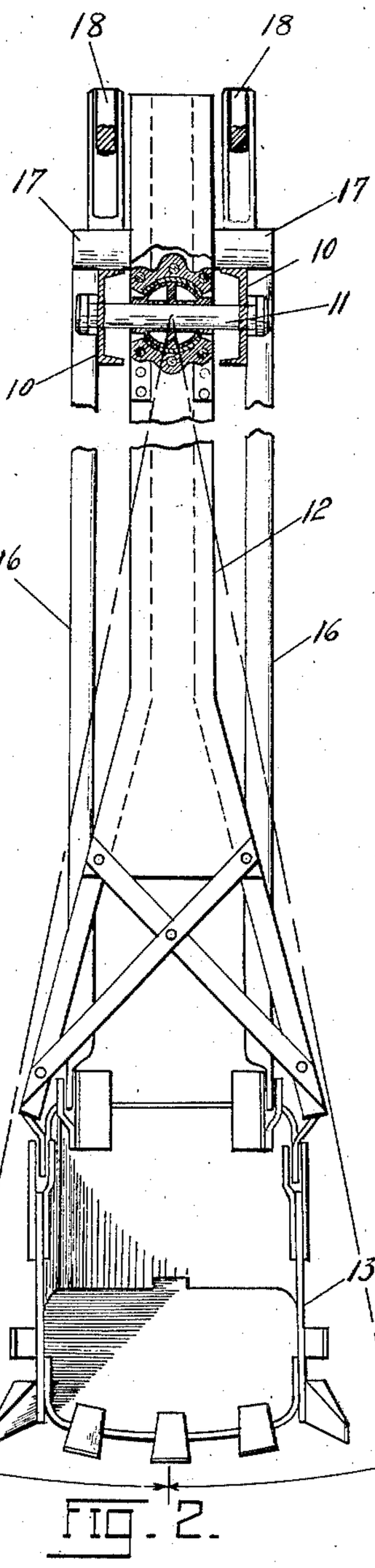

FIG. 2.

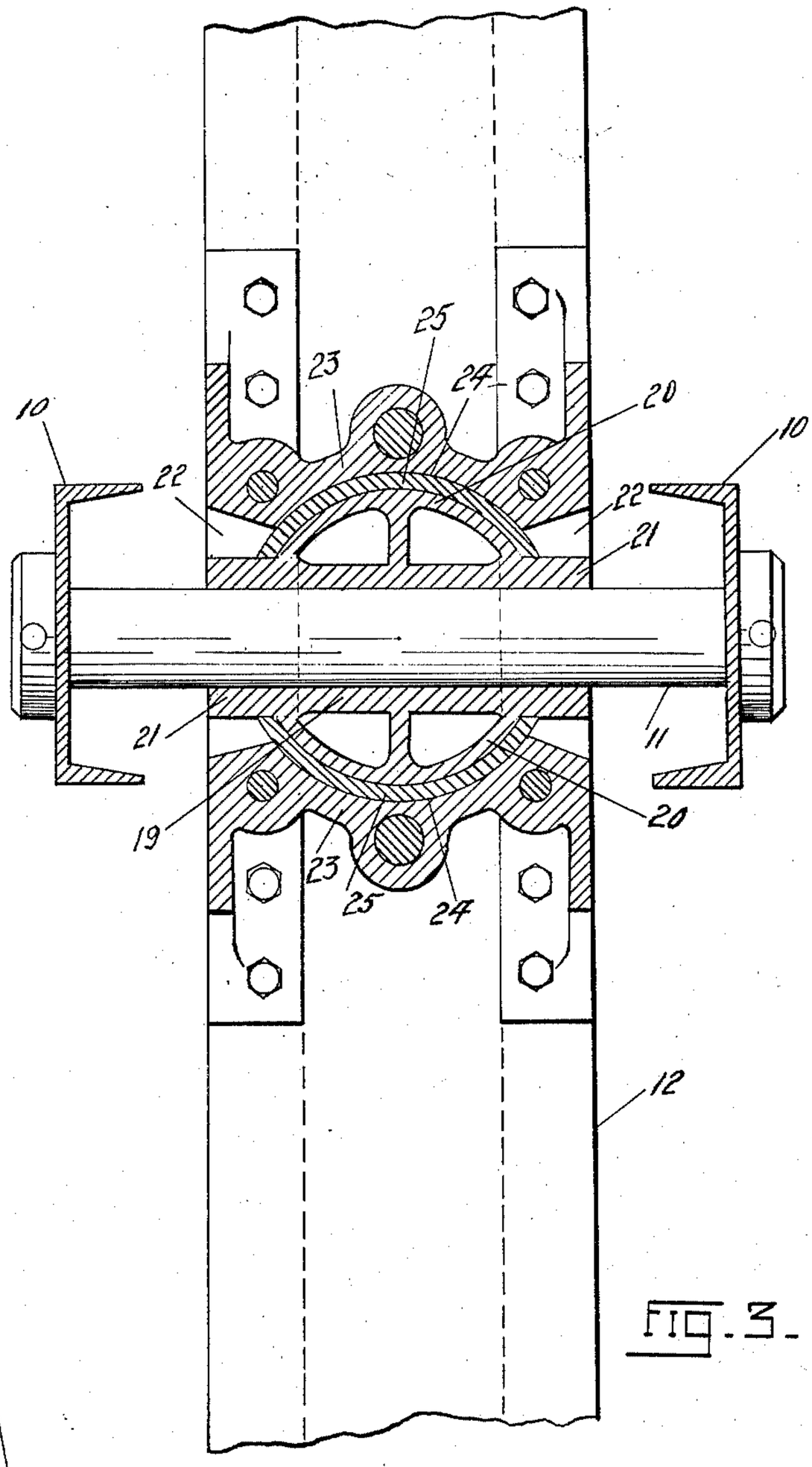

FIG. 3.

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Patented Sept. 4, 1928. 1,682,774

UNITED STATES PATENT OFFICE.

BIRD C. CLUTTER, OF AKRON, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO CLUTTER-WAGNER, INC., A CORPORATION OF OHIO.

EXCAVATOR.

Application filed March 22, 1927. Serial No. 177,296.

This invention relates to excavators, and particularly to those embodying a dipper arm for carrying the scoop and pivoted on the boom.

In the operation of such excavators, especially when swinging the boom laterally either on full-revolving or other excavators, inertia forces tend relatively to swing the the dipper and scoop transversely of the boom which exerts tortional stresses in the boom structure distorting the same.

The general purpose of the present invention is to provide an improved pivotal connection between the dipper arm and the boom, whereby restricted lateral swinging of the arm and scoop will be permitted, thus relieving the boom of heavy tortional strains and also permitting more effective manipulation of the scoop in forming straight or even under-cut walls in excavations.

The above and other purposes are attained by the excavator disclosed in the accompanying drawings and described below. It is to be understood that the invention is not limited to the specific form thereof shown and described.

Of the accompanying drawings,

Figure 1 is a part side elevation of an excavator embodying the invention;

Figure 2 is a section on line 2—2 of Figure 1, and.

Figure 3 is a detail section of the pivotal mounting for the dipper arm or stick on the boom.

Referring to the drawings, the excavator therein shown is of the ditcher type, such as disclosed in United States Letters Patent No. 1,561,694, granted November 17, 1925, but it is understood that many of the benefits of the invention are to be derived from its use in any type of excavator employing a boom and dipper arm.

The numeral 10 designates the boom which may be mounted for vertical swinging movement and also for lateral movement in any of the well-known types of full-revolving or lateral swinging boom excavators. Pivoted at 11 on the boom 10 is the dipper arm 12 carrying a scoop 13 which is actuated by cables 14 and 15, the former being connected to the arm 12 at a point above pivot 11 and the other to the scoop 13 by means of the bale 13ª. The angularity of the scoop 13 on the arm as herein shown is arranged to be adjusted automatically by links 16, bell-cranks 17 and links 18 connected to boom 10. The present invention, however, is not directed to, nor does it depend upon this particular construction.

As best shown in Figures 2 and 3, the pivot pin 11 preferably extends between spaced members forming boom 10 and has mounted thereon a sleeve 19 formed with opposite part-cylindrical bearings 20, 20 and squared extensions 21, 21 engaging in slots 22, 22 formed through the sides of a box-bearing 23 secured on dipper arm 12 and having concave, cylindrical bearing surfaces at 24, 24 bearing on bearing members 20 which preferably have friction material 25 thereon, such as Babbitt metal. The squared extensions 21 cooperating with slots 22 serve to hold the cooperating bearing members 20 and 23 in proper assembly and also the length of the slots 22 defines the limit of relative shifting between bearing members 23 and bearing members 20.

It will be seen that relative pivotal movement of the arm 12 and boom 10 in a vertical plane takes place about pin 11, the whole bearing assembly 20, 20 and 23 moving with the arm 12 and capable in any position of said arm of permitting relative lateral swinging of the arm with respect to the boom which is limited by engagement of extensions 21 with the ends of slots 22. This lateral swinging of the arm relative to the boom occurs when the boom is swung laterally and is the reaction of forces overcoming the inertia of the stick, scoop and mass of material in the scoop. The lateral pivotal movement of the arm is resisted to some extent by the friction in the bearing and a large measure of the load previously expended in the boom as tortional stress is absorbed in the arm as longitudinal stress since lateral swinging of the arm elevates the center of gravity of the load supported thereby.

In excavating operations it is possible by skillful manipulation of the excavator to swing the scoop 13 laterally into such positions as effectively to cut square corners and straight or even under-cut walls.

Modifications of the invention may be resorted to without departing from the spirit thereof or the scope of the appended claim.

What is claimed is:

An excavator comprising a boom, and a

stick pivoted on the boom, the pivot for the stick on the boom comprising a pin on the boom, a bearing member journaled on the pin and formed with transversely curved bearing surfaces, a box-bearing member secured to the stick and having surfaces co-operating with said curved bearing surfaces on said first bearing member and extensions on the first bearing member engaging in slots in the box-bearing member for retaining the bearing members in proper relationship and limiting relative lateral movement of the boom and stick.

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