April 29, 1930. G. T. RONK 1,756,387

MACHINE FRAME

Filed May 8, 1928

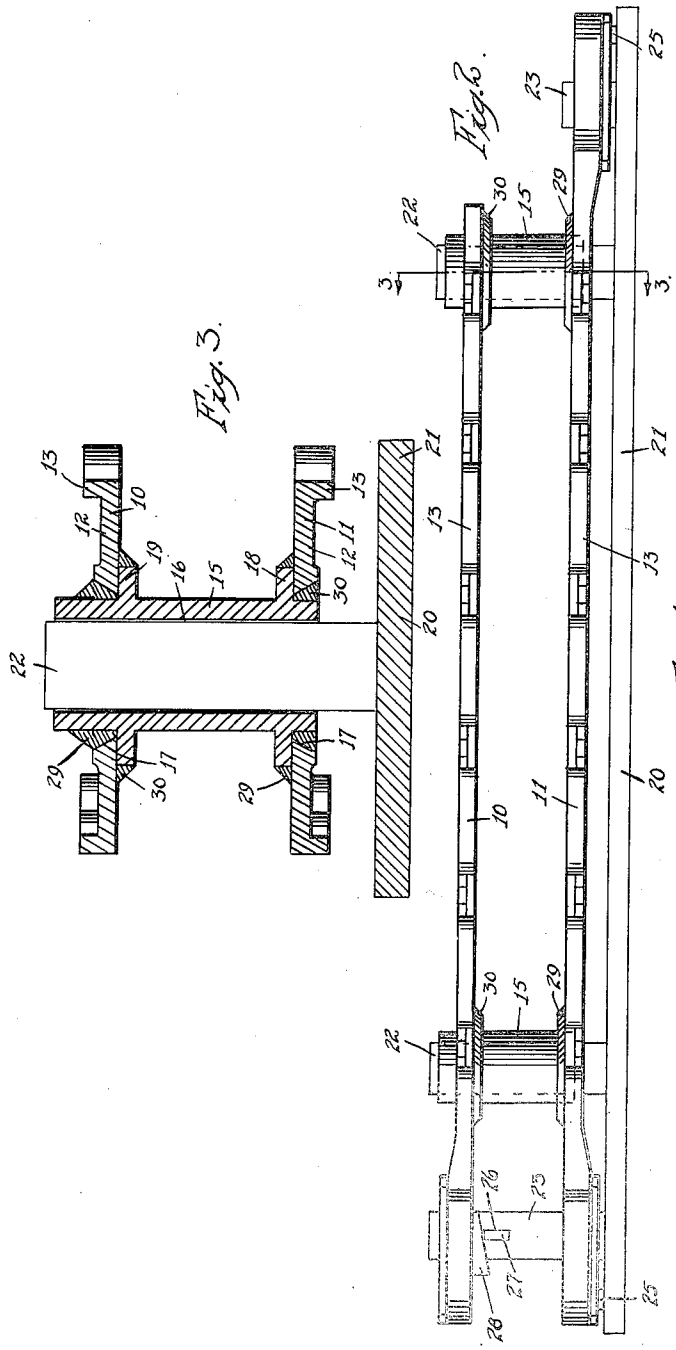


Fig. 3.

Fig. 2.

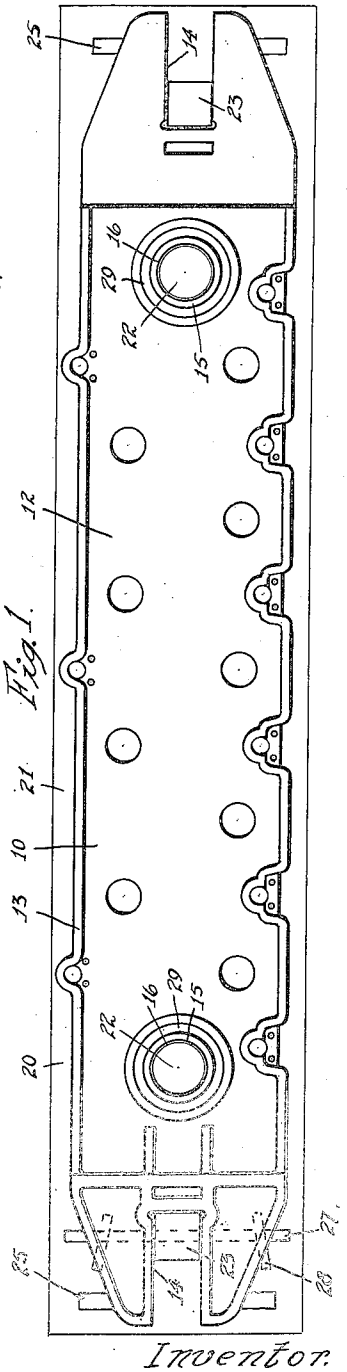


Fig. 1.

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UNITED STATES PATENT OFFICE

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MACHINE FRAME

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This invention relates to machine frames of that type designed to be used in connection with the construction of large and heavy machinery, and particularly to that type of frames employing flat and parallel plates connected by transverse members or sleeves, said sleeves being adapted to act as axle bearings; and my present invention relates particularly to a frame member designed to be used in connection with the treads of ditching machines of the linked tread type.

In machines of this type the plates of the castings are sometimes twelve feet long and two feet wide, and spaced apart a considerable distance and connected with sleeves forming axle bearings. In casting frame members of this type, great difficulty is experienced due to shrinkage of the casting, and also to warping of the casting, making it difficult to accurately cast the sleeve so the shafting will be properly spaced. Further difficulty is experienced in machining the sleeves with the castings and other bearing surfaces, inasmuch as the castings are heavy and bulky.

It is therefore the object of my invention to provide an improved frame member, and the method of making same, whereby large frame members may be easily and cheaply constructed of cast metal, and at the same time be strong and accurate.

My invention consists in the construction, arrangement and combination of the various parts of the device, whereby the object contemplated is attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 is a side elevation of a frame member formed by my improved method, said frame member being illustrated as applied to a templet or form, said templet being in elevation.

Figure 2 is a plan view of my improved frame, the templet being in elevation.

Figure 3 is a detail sectional view taken on the line 3—3 of Figure 2.

The frame member illustrated comprises a pair of plates 10 and 11, which are substantially the same with the exception that they are made in rights and lefts, and one is shorter at one end than the other. Each of the plates 10 and 11 comprises a web portion 12 substantially of uniform thickness throughout its entire length. Each edge of the web portion is provided with a flange 13 to stiffen the same. Each end of the plate 11 is tapered and provided with an inwardly extending notch 14 designed to provide guideways for an adjustable bearing adapted to move longitudinally of the frame. One end of the frame 10 is shortened, while the other end is tapered and provided with a slot similar to the notch 14.

The plates 10 and 11 are connected by sleeves 15, each of which is provided with an opening 16 for receiving shafts, said openings being machined to form suitable bearings.

It will readily be seen that great difficulty would be experienced in casting the plates 10 and 11 and the sleeves 15 in a single unitary casting, yet it is very desirable to have the frame thus formed to make it rigid.

In the actual construction of this frame, I cast each of the plates 10 and 11 separately, and provide in each of the said plates openings 17, the centers of which are in alinement with the centers of the sleeves 15. The said openings 17 are somewhat larger in diameter than the diameter of the sleeves, and have their edges beveled outwardly, as clearly illustrated in Figure 3. Each of the sleeves 15 is also cast separately, and each provided with a pair of flanges 18 and 19. The said flanges are so spaced that their outer surfaces will engage the inner surfaces of the plates 10 and 11 when the said sleeves are inserted therein. These sleeves are bored and the outer faces of the flanges 18 and 19 may be finished if so desired to give accurate spacing between the outer faces of the flanges, which should be equal to the distance between the plates 10 and 11.

In assembling the frame, I first provide a form or templet 20 having a base 21 provided with upwardly extending shafts 22 accurately spaced apart and alined with said base, the spacing of said shafts 22 being the same as the finished spacing of the centers of the sleeves 15.

I have also provided at each end of the base 20 an upwardly projecting post 23. Said posts 23 and the shafts 22 are in alinement longitudinally of the casting.

The frame member 11 is then placed in position with its inner face uppermost, with the shafts 22 projecting through the openings 17 and with the posts 23 passing through the slots 14. The plate 11 may then be wedged up so that its inner face is parallel with the base 21. This is accomplished by suitable wedges 25. The sleeves 15 are then placed on the shafts 22 with their flanges 18 supported on the upper face of the frame 11. It should be noted that the flanges 18 and 19 are supported inwardly from the ends of the sleeves so that the ends of the sleeves will project through the openings 17. The plate 10 is then on top of the flanges 19 with the sleeves 15 extending through the openings 17, and the slot 14 over the left hand post 23, as shown in Figures 1 and 2. The last said post is provided with a transverse opening 26 for receiving a transverse bar 27 located beneath the end of the frame 10. Suitable wedges 28 may then be employed for bringing the inner face of the frame member 10 parallel with the inner face of the member 11. The said frame 10 may be adjusted longitudinally if necessary, on account of the openings 17 being larger than the sleeves 15.

After the frame members are properly placed, the flanges 18 of the sleeves 15 are secured to the inner face of the frame 11 by placing moulten metal between the periphery of the flanges 18 and the inner face of the plate 11. This is best accomplished by what is commonly known as the electric welding process, which permanently welds the peripheries of the flanges to the plate.

It will be seen that the beveled edges of the openings 17 form annular grooves about the sleeves 15, said grooves being open at their outer sides and closed at their inner sides by the flanges 19. The upper annular grooves are next filled with moulten metal by the electric welding process, said layer of metal being designated by the numeral 29, said metal being filled in until it is cone shaped as illustrated in Figure 3.

By this means the edges of the openings 17 are permanently secured to the sleeve 15. The members 10 and 11 and the sleeves 15 are thus rigidly supported together by the upper and lower welds 29. The entire frame may then be lifted from the shafts 22 and the posts 23, after which the frame is inverted. Then the annular grooves in the frame 11 are filled with moulten metal, as illustrated at 30, and the periphery of the flange 19 is welded to the inner face of the plate 10.

Thus it will be seen that I have provided a frame member which is very rigid in its formation, due to the fact that the edges of the openings 17 are positively welded to the sleeves 15, and further strengthened by welding the periphery of the flanges 18 and 19 to the inner surface of the plates. This last welding is very effective due to the fact that the welding is supported a considerable distance from the center of the sleeve, and provides means for eliminating torsional or twisting strains on the plates.

Thus it will be seen that I have provided a frame member which is very rigid and comparatively cheap, and at the same time provides a frame wherein the bearings are absolutely in proper alinement with the said frame, and one which is very strong due to the union between the edges of the flanges, and the iner surfaces of the plates.

I claim as my invention:

1. A machine frame comprising a pair of parallel and spaced plates, each having sleeve receiving openings, a sleeve supported in each set of corresponding openings, each sleeve having circumferential flanges supported adjacent to the inner faces of said plates, said openings being larger than the sleeves and smaller than the flanges to form annular grooves about said sleeves, the sleeves and plates being welded together to form an integral frame.

2. A machine frame comprising a pair of spaced plates each having sleeve receiving openings, a sleeve supported in each set of corresponding openings, said openings being larger than the sleeves to form annular grooves about said sleeves, said sleeves having a flange overlapping one of the faces of said plates, said plates being united to said sleeve and flanges by welding.

3. A machine frame comprising a pair of spaced plates each having sleeve receiving openings, a sleeve supported in each set of corresponding openings, said openings being larger than the sleeves, said sleeves having flanges overlapping one of the faces of each of said plates, the edge of said opening being welded to said sleeve and the peripheries of said flanges being welded to said plates.

Des Moines, Iowa, April 25, 1928.

GEORGE T. RONK.