Nov. 19, 1929. S. E. KURTZ 1,736,538

ICE CUTTING DEVICE

Filed April 16, 1923 2 Sheets-Sheet 1

Fig. 1.

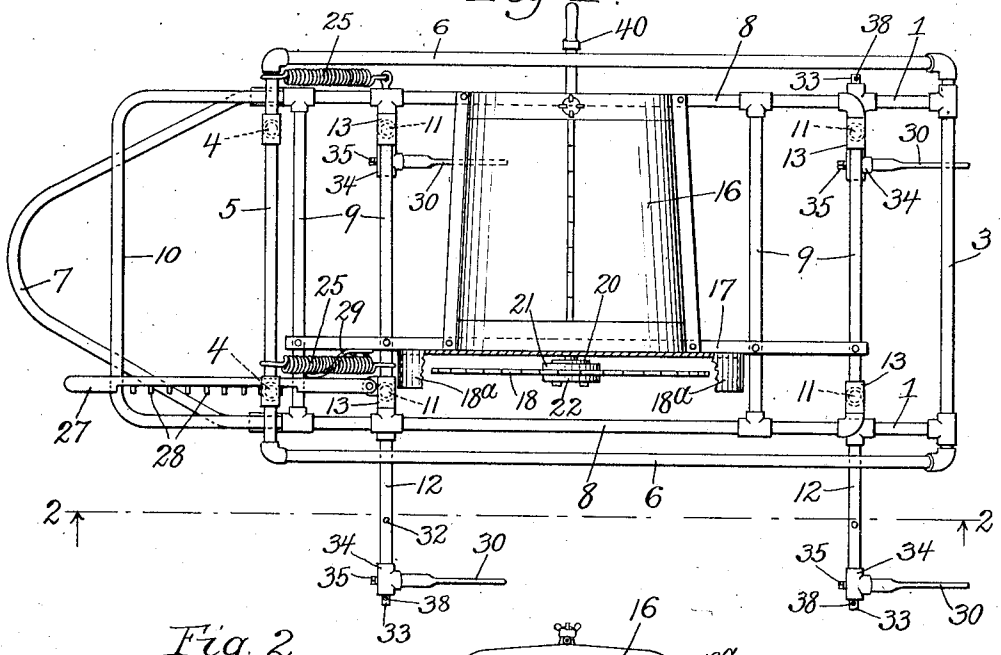
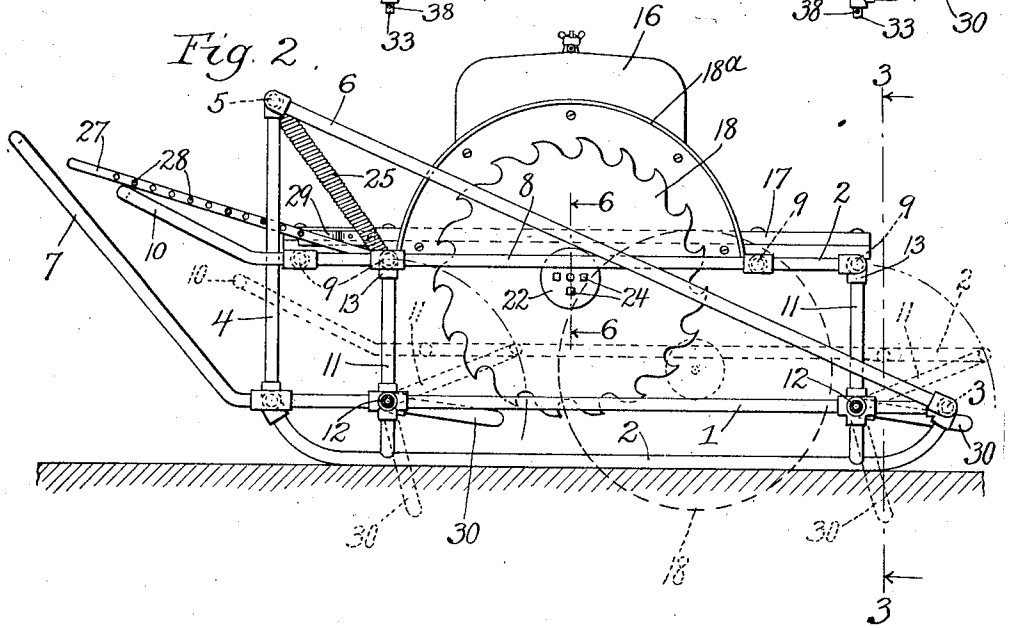


Fig. 2.



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Fig. 4.

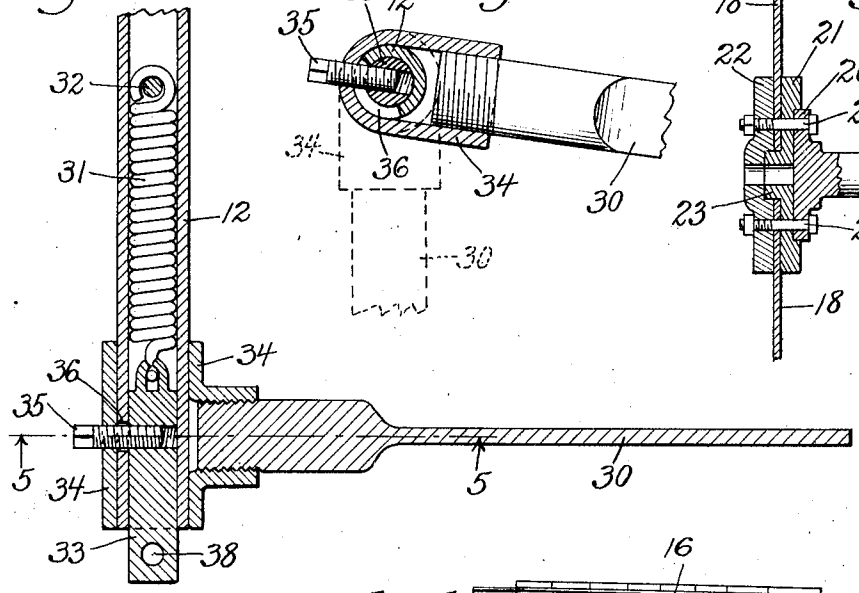
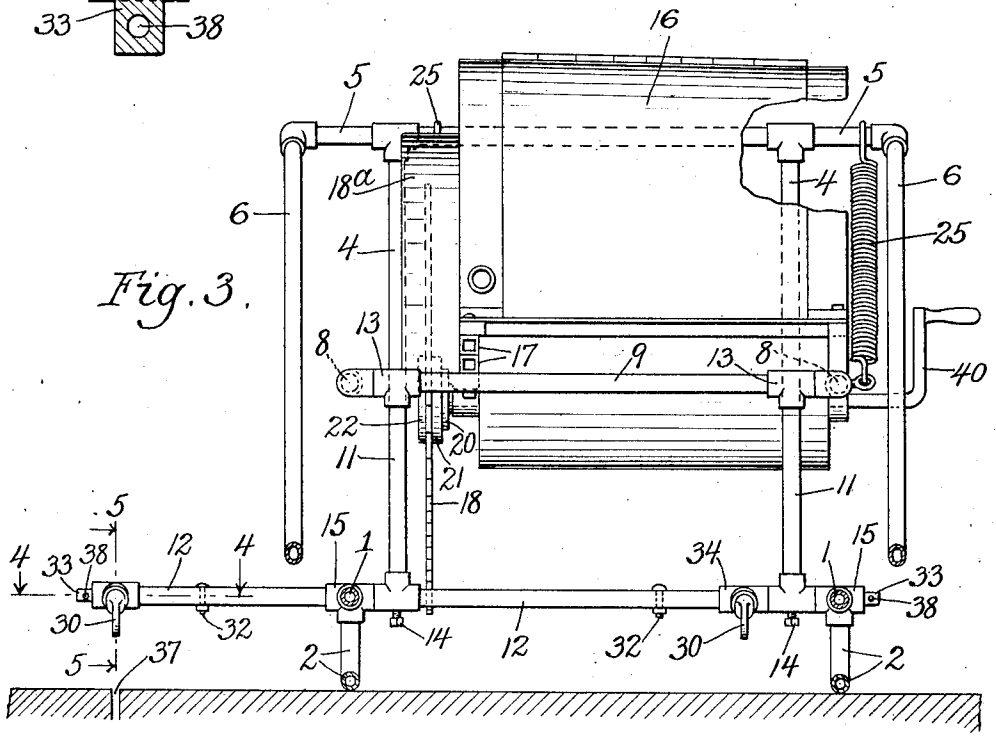


Fig. 5.

Fig. 6.

Fig. 3.



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UNITED STATES PATENT OFFICE

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ICE-CUTTING DEVICE

Application filed April 16, 1923. Serial No. 632,273.

This invention relates to ice cutting devices and has for its object to provide a new and improved device of this description. The invention has as a further object to provide a simple, cheap and effective power operated ice cutting device which can be easily controlled and guided while in operation. The invention has other objects which are more particularly pointed out in the accompanying description.

Referring now to the drawings:

Fig. 1 is a plan view of one form of the device embodying the invention.

Fig. 2 is a side elevation of the device shown in Fig. 1.

Fig. 3 is a sectional view taken on line 3—3 of Fig. 2.

Fig. 4 is a sectional view taken on line 4—4 of Fig. 3.

Fig. 5 is a sectional view taken on line 5—5 of Fig. 4.

Fig. 6 is a sectional view taken on line 6—6 of Fig. 2.

Like numerals refer to like parts throughout the several figures.

In carrying out the invention I provide a frame of any suitable material. I have illustrated the frame as being made out of iron pipe as this makes a cheap, durable and light frame. This frame consists of the lower longitudinal members 1 to which are connected the runners 2, the members 1 having suitable cross connecting members 3 at the rear. There are upstanding members 4 which are connected together by the cross member 5, this cross member being connected by the diagonal member 6 with the rear cross member 3. This frame has connected therewith a handle 7. Mounted upon the frame of the machine is a movable engine frame which consists of the longitudinal members 8 and the cross members 9. This frame is provided with a handle 10 by means of which it may be controlled. The engine frame is connected by the upright members 11 with the cross members 12 of the main frame. In the construction shown, for example, a simple method of construction is illustrated. In this construction the uprights 11 are provided with members 13 which are rotatably mounted on the cross members 9. At the lower end the uprights 11 are fastened to the members 12 in any desirable manner as by set screws 14. The members 12 are rotatably mounted in the sockets 15 of the main frame. By means of this construction the engine frame may be raised and lowered, one of the lowered positions being shown in dotted lines in Fig. 2. Mounted upon the engine frame is an engine 16 of any suitable type such, for example, as an internal combustion engine. This engine at one end is carried by the frame piece 8 and at the other end by the longitudinal supporting member 17. A saw 18 is directly connected to the engine shaft 19 so as to act both as a saw and as a fly wheel for the engine. The saw may be connected with the engine shaft in various ways and I have illustrated a preferred form clearly shown in Fig. 6 wherein the engine shaft is provided with an enlargement or disc 20. The saw 18 is located between two discs 21 and 22. The disc 21 is provided with a projection 23 which projects into the opening of the saw which is preferably of the exact size of the hole in the saw so as to properly center the saw. The disc 22 is provided with a recess into which the projection 23 is received as illustrated in Fig. 6. The parts are then held in position by any suitable fastening devices such as the bolts 24. I prefer to arrange the engine frame so that it may be easily operated by one man. In the construction shown springs 25 connect the engine frame and the main frame the springs in this case being connected to the upper cross member 5 of the main frame. It will be noted that when the engine frame is lowered to position for example as shown in dotted lines and in Fig. 2, the tension of the springs 25 is increased and the pull increased and these springs may be so proportioned as to permit the engine frame to be easily raised and lowered by one man. The engine frame is locked in any desired position by means of the locking device 27 (see Figs. 1 and 2) which consists of an arm pivoted to the engine frame said arm being provided with a series of projections 28 spaced apart so that the upright member 4 (see Fig. 2) will fit between them. A spring 29 (Fig. 1) normally tends to hold

the locking device in position so that the member 4 is between two of the projections 28. When it is desired to move the engine frame the locking device 27 is moved away from the upright 4 so as to release such upright and the frame will then be moved either down or up by means of the handle 10. When the engine frame is in the desired position the locking device is moved toward the upright 4 so as to lock it in this position. The saw 8 is preferably provided with a guard 18a. It will be noted that by this construction the engine frame whenever moved is kept in a parallel relationship with the surface of the ice so that the oil in the engine crank shaft will always be level so as to insure the proper oiling of the parts. Some means is provided for properly guiding the machine so as to maintain the proper width of ice cut. In the construction shown the members 12 at one side project beyond the runners 26 (Figs. 1 and 3) and are provided with the guides 30 which fit into the cut made by the saw so as to properly guide the machine. There are also another set of guides 30 located between the runners (see Figs. 1 and 2). These guides are arranged so that they can not freeze up and so that they will automatically lift up when they meet obstructions. In the construction shown this is accomplished as follows—Within the members 12 are coil springs 31 (see Fig. 4). At one end these springs are fastened by suitable fastening devices 32 with the members 12. At the other end these springs are fastened to a member 33 rotatable in the member 12. The guides 30 are movably connected by the connecting pieces 34 rotating on said members. The pieces 34 are connected with the pieces 33 by the connecting pieces 35 which in this instance are screws. The members 12 are provided with slots 36 (see Fig. 5) through which these screws pass. Prior to connecting the pieces 33 and 34 the piece 33 is rotated so as to, as it were, wind up the spring 31. This is done by passing the handle through the hole 36. When the springs 31 are wound they force the guides 30 down into the groove 37 cut into the ice (see Fig. 3). When the engine frame is in its elevated position these guides 30 are free from the ice but when the engine frame is lowered the members 12 are rotated so as to force the guides 30 down into this groove 37 and they guide the machine as it is moved forward. If there is an obstruction in the groove the guides are free to move up, the pressure of the obstruction rotating the piece 34 on the piece 12, the screw 35 moving along the slot 36. When the obstruction is past spring 31 again forces the guide 30 down into the groove 37. It will be noted that the springs 31 are inclosed in the members 12 so as to be completely protected and they can not, therefore, freeze up or be otherwise rendered inoperative and they will at the same time freely move when obstacles are in the way. I have shown the engine as being one of the ordinary internal combustion engines with the starting crank 40. When it is desired to use the device it is brought out upon the ice while the engine frame is elevated and can be pulled by the handle 7. When it is desired to cut the ice the engine frame is moved down so that the saw engages the ice, the engine frame being moved down the amount desired to permit the saw to saw the proper depth and the frame is then held in this position by the holding device 27. The engine being in operation causes the saw to revolve and cut the ice. The saw also acts to drive the device forward and it is only necessary to guide it by the handle 7. The device is then moved back and forth across the ice in the usual way the guiding device 30 working in the slot made by the saw so as to regulate the width of the ice cut. The device is so constructed that one man can operate it. The springs making it easy for one man to raise and lower the engine and saw. The saw in this construction has three functions. First, it acts as the fly wheel for the internal combustion engine. Second it acts to saw the ice and thirdly it acts as a propeller to propel the machine forward, the operator simply guiding it.

It will be seen that by means of this device I have provided a light, cheap, hard, strong, durable and efficient ice cutting device which can be operated by one man. I have described in detail a particular construction embodying the invention but it is of course evident that the parts may be varied in many particulars without departing from the spirit of the invention as embodied in the claims hereto appended and I therefore do not limit myself to the particular construction shown.

I claim:

1. An ice cutting device comprising a main frame, a movable engine frame movably mounted on said main frame, an internal combustion engine on said engine frame, a saw directly mounted upon said engine shaft and said saw also acting as the fly wheel for the engine, means for maintaining said engine frame in a substantially horizontal position during all of its various positions.

2. An ice cutting device comprising a main frame, a movable engine frame movably mounted on said main frame, an internal combustion engine on said engine frame, a saw operatively connected with said engine and said saw also acting as the fly wheel for the engine, means for maintaining said engine frame in a substantially horizontal position during all of its various positions and counterbalancing means for the engine and engine frame.

3. An ice cutting device comprising a main frame, an engine frame movably mounted on said main frame, a saw operatively connected with said engine, said engine frame pivotally

connected at separated points with the main frame so that it may be raised or lowered, means for maintaining said engine frame in a substantially horizontal position during all of its various positions, and guides at the opposite ends thereof for properly guiding the machine to maintain the proper width of ice cut, the said guides connected with said engine frame so as to be automatically moved to their operative and inoperative positions when the engine frame is moved to move the saw to its operative and inoperative positions.

4. An ice cutting device comprising a frame, a hollow projecting part connected with said frame and projecting to one side thereof, a spring in said part, means for fastening one end of the spring to said part, a movable member in said hollow part to which the other end of the spring is connected, a member mounted upon said hollow part, a connection between said members said connections working in a slot in said hollow part and a guide connected with one of said pieces.

5. An ice cutting device comprising a frame, a hollow projecting part connected therewith, a guide removably mounted on said part, a spring contained within said part and means for operatively connecting said guide with said spring so that the spring tends to hold the guide elastically in its guiding position.

6. An ice cutting device comprising a main frame formed of pipes and having runners on the lower side and upwardly extending parts located outside of said main frame and connected with the rear cross member thereof said diagonal parts at the front and diagonal parts connecting said upwardly extending parts to the rear portion of the frame said main frame having members extending parallel to the runners, an engine frame pivotally connected with the said members of the main frame extending parallel to the runners, an engine on said frame, a saw operatively connected with said engine. springs connecting the engine frame with the upwardly extending parts of the main frame and means for holding the engine frame in its maximum up and maximum down positions.

7. An ice cutting device comprising runners, a movable frame movably mounted upon said runners, an internal combustion engine mounted upon said frame and provided with an engine shaft, a saw directly connected with said engine shaft, said saw by itself acting as a fly wheel for the engine, and means for raising and lowering said movable frame so as to move the saw into and out of its operative position.

Signed at Chicago, county of Cook, and State of Illinois.

SAMUEL E. KURTZ.