

Oct. 7, 1930.

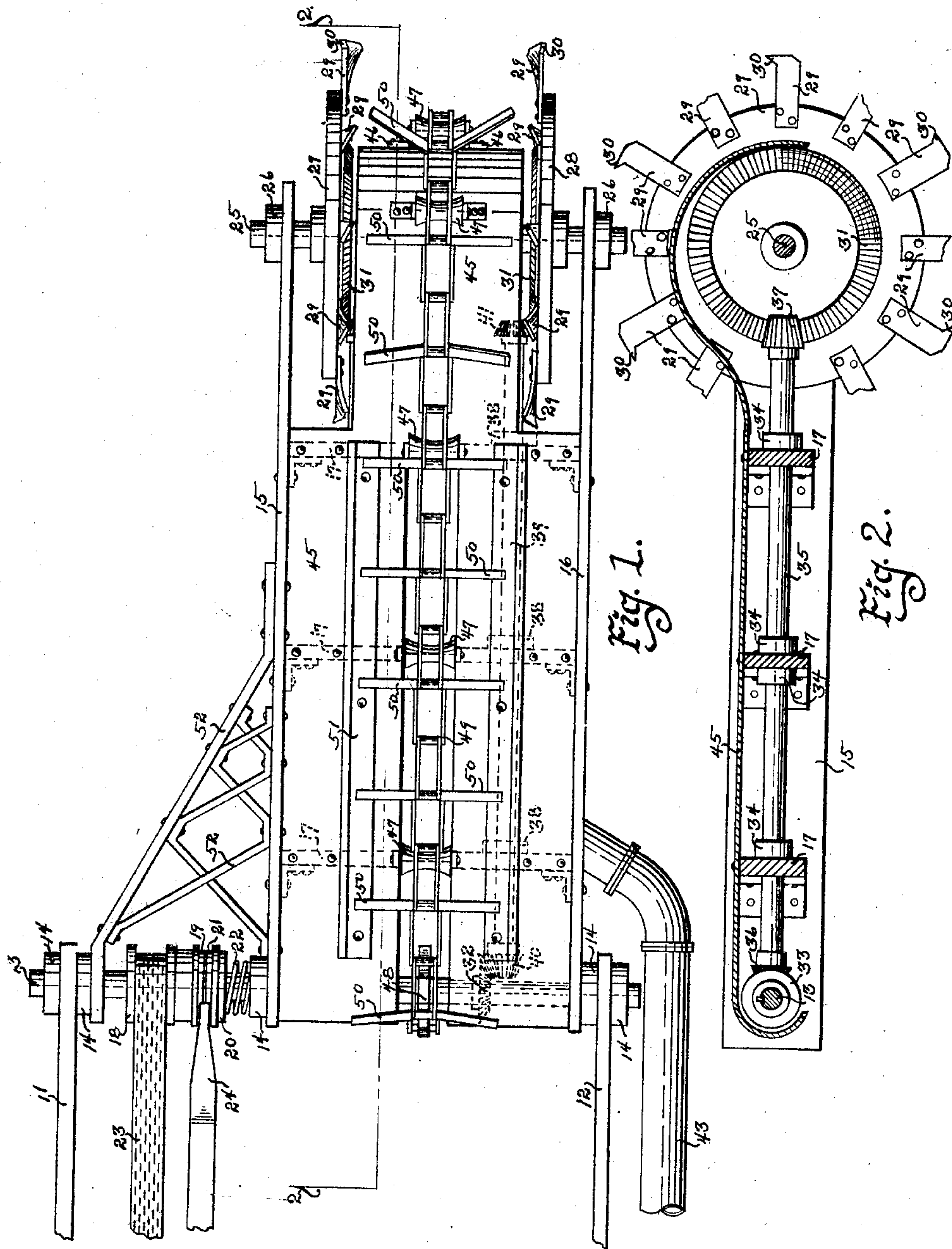
C. R. PENNEY

1,777,575

HYDRAULIC DREDGING MACHINE

Filed July 30, 1928

2 Sheets-Sheet 1



Inventor  
- Clarence R. Penney -  
By M. Talbert & Dick  
Attorney

Oct. 7, 1930.

C. R. PENNEY

1,777,575

HYDRAULIC DREDGING MACHINE

Filed July 30, 1928

2 Sheets-Sheet 2

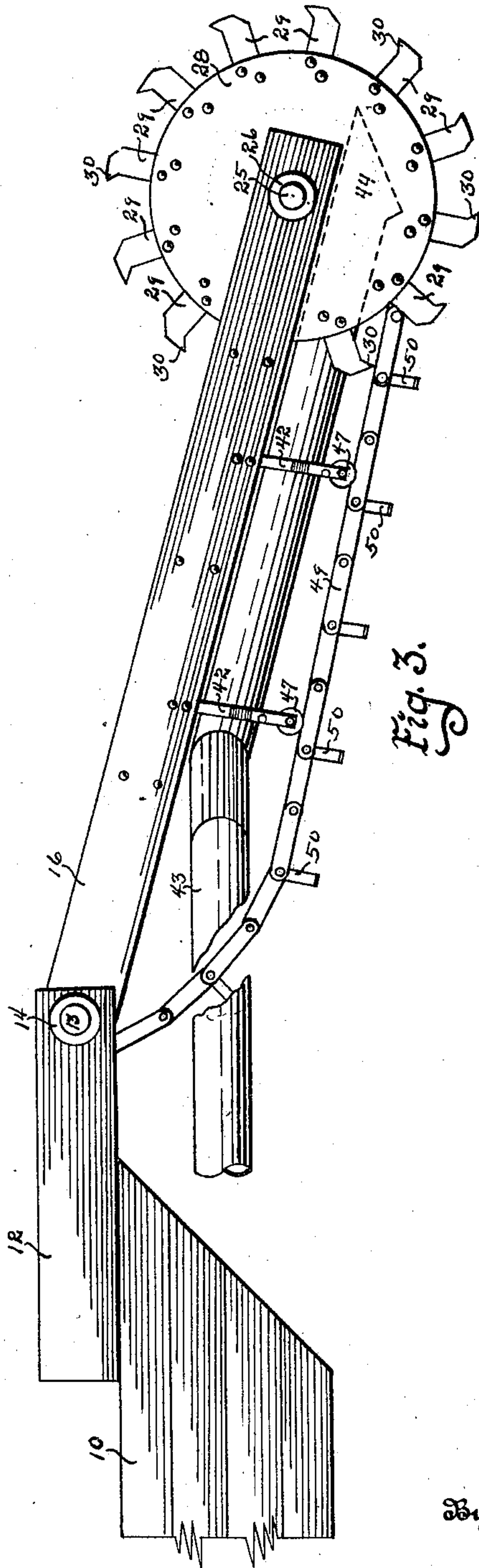


Fig. 3.

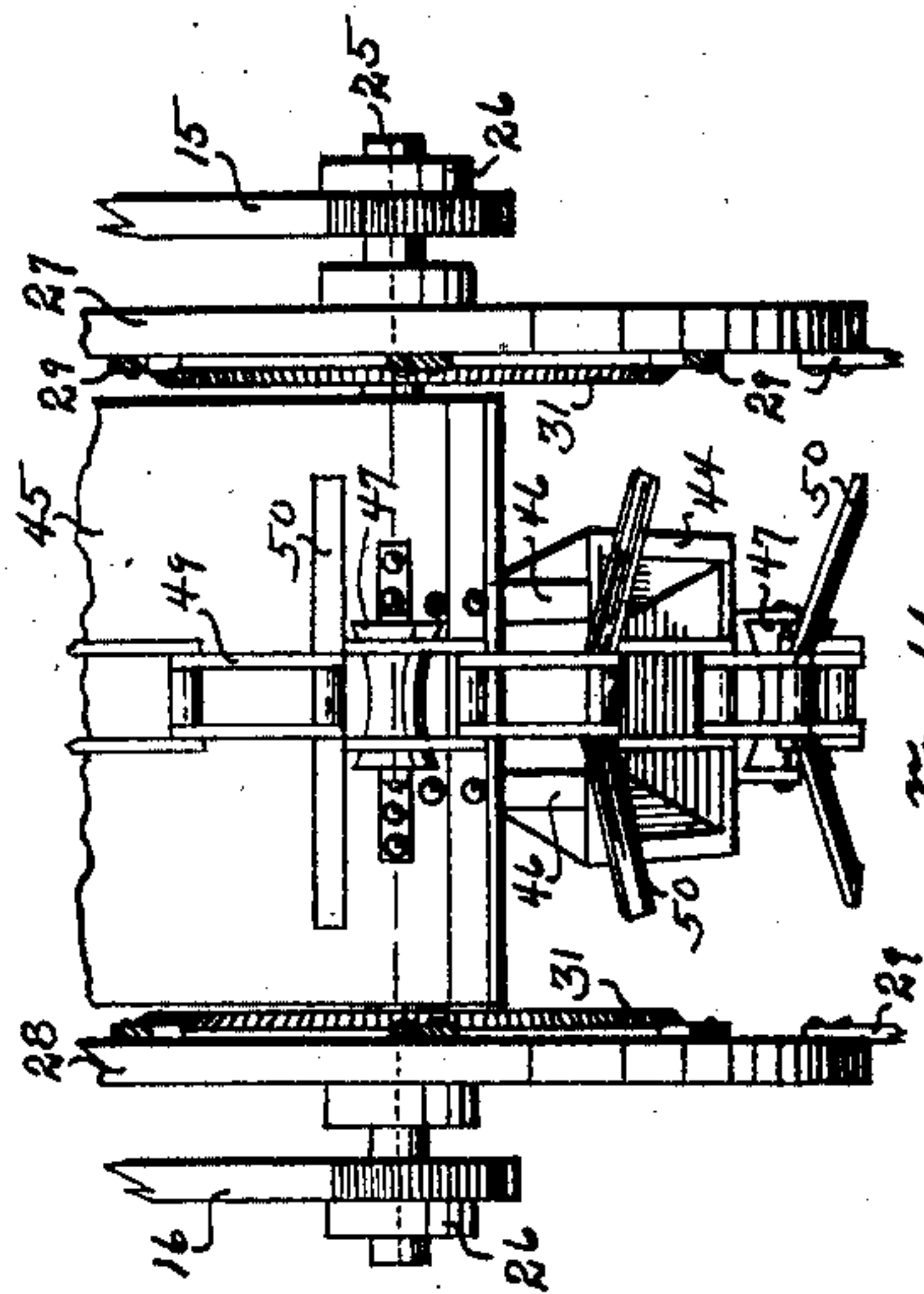


Fig. 4.

Inventor

Clarence R. Penney

By M. Talbert Dick

Attorney



# UNITED STATES PATENT OFFICE

CLARENCE B. PENNEY, OF DES MOINES, IOWA, ASSIGNOR TO CLIFFORD V. RAY, OF DES MOINES, IOWA

## HYDRAULIC DREDGING MACHINE

Application filed July 30, 1928. Serial No. 296,263.

The principal object of this invention is to provide a hydraulic dredging machine for obtaining material such as sand and gravel from the beds of rivers, lakes and the like that is economical in manufacture and durable in use.

A further object of my invention is to provide a hydraulic dredging machine that has wearing parts that may be easily removed and replaced with new ones.

A still further object of this invention is to provide a hydraulic dredging or excavating machine that agitates the material to be obtained with a minimum amount of power.

A still further object of this invention is to provide a dredging machine that is so constructed that large rocks, sticks and the like will be prevented from entering the suction nozzle and choking the same.

A still further object of this invention is to provide a dredging machine that removes large stones, obstructions and the like from a position adjacent to the suction nozzle.

These and other objects will be apparent to those skilled in the art.

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

Fig. 1 is a top plan view of my complete invention ready for use.

Fig. 2 is a side sectional view taken on line 2—2 of Fig. 1 and more fully illustrates the construction of the same.

Fig. 3 is a side view of the invention secured to a barge or the like.

Fig. 4 is a front end view of a portion of my machine and more fully illustrates its nozzle portions.

The dredging machines now on the market are very cumbersome, do not successfully agitate the material to be obtained and are beyond the financial reach of many sand and gravel operators. They are also very costly in use as the parts wear readily and in most instances are incapable of replacement and

due to their great bulk require a great amount of power to operate.

I have used the numeral 10 to designate the barge or operating base. To this member 10 is secured by suitable means the two parallel supporting arms 11 and 12. Journaled in the free ends of the arms 11 and 12 is the drive shaft 13 but is prevented from lateral movement by the collar members 14, as shown in Fig. 1. Having their rear ends hinged on the shaft 13 and between the two arms 11 and 12 are the two parallel brace members 15 and 16 respectively. These two brace members are spaced and held apart by the cross braces 17, as shown in Figs. 1 and 2.

Loosely mounted on the shaft 13 is the pulley wheel 18 having the driving face 19 on one of its sides. Slidably mounted on the shaft 13 but secured against relative rotary movement thereto, by suitable means such as a key, is the wheel 20 having the driving face 21 capable of engaging the driving face 19. The numeral 22 designates a coil spring for yieldingly holding the driving face 21 in operative engagement with the driving face 19. The numeral 23 designates an endless belt in engagement with the pulley wheel 18 and leading to a prime mover not shown. By this arrangement, when the endless belt 23 is driven by the prime mover the shaft 13 will be rotated. The numeral 24 designates the ordinary spreading fork for increasing the distance between the pulley wheel 18 and the wheel 20 in order that the driving faces 19 and 21 will be forced out of engagement with each other, thereby allowing the pulley wheel 18 to be rotated without rotating the shaft 13. When it is desired to have the shaft 13 rotated with the pulley wheel 18 it is merely necessary to pull the spreading fork 24 to the rear to allow the coil spring 22 to force the driving faces 19 and 21 into engagement with each other. Rotatably mounted in the free ends of the two parallel brace members 15 and 16 is the shaft 25. This shaft is prevented from sliding laterally in the members 15 and 16 by the ordinary retaining collars 26. Permanently secured on the shaft 25 by suitable means and spaced apart are the two disk wheels 27 and



28 respectively. Secured by suitable means, such as rivets or bolts, to the inner side and near the periphery of each of these wheels are a plurality of digging and agitating knives 29.

These knives extend beyond the periphery of the wheel to which they are secured and have integrally formed on their free end and extending in the direction of their rotation the hook or prong portion 30. It will also be noted that the heel of each of these knives extends inwardly, thereby forcing the sand and gravel which they come in contact with inwardly. When these knives become worn beyond further successful use they may be easily removed from the wheels to which they are secured and new knives substituted. On the inner side of each of the wheels 27 and 28 are the endless bevel gear teeth 31. Permanently secured on the shaft 13 are the two bevel gears 32 and 33 respectively. Rotatably mounted in the cross braces 17 and prevented from sliding movement therein by the collars 34 is the shaft 35 having the bevel gear 36 permanently secured on one of its ends and in engagement with the bevel gear 33 and the bevel gear 37 permanently secured on its other end and in engagement with the gear teeth 31 on the wheel 27. Rotatably mounted in the cross braces 17 and prevented from sliding movement therein by the collars 38 is the second shaft 39 having the bevel gear 40 permanently secured to one of its ends and in engagement with the bevel gear 32 and the bevel gear 41 permanently secured to its other end and in operative engagement with the gear teeth 31 on the wheel 28. By this construction, when the shaft 13 is rotated the wheels 27 and 28, carrying the knives 29, will be rotated and the sand and gravel with which they come in contact will be loosened and agitated. Supported and secured by the brackets 42 on the under side of the frame portion is the ordinary suction pipe 43 having the suction nozzle 44 terminating between and adjacent the wheels 27 and 28, as shown in Fig. 3.

This suction pipe 43 leads to a suitable pump, not shown, which draws the sand and gravel into the nozzle 44 which has been lifted and agitated by the knives 29. The numeral 45 designates a shield secured to the top of the cross braces 17 and extending in a circular path between the wheels 27 and 28 until it terminates slightly above the suction nozzle 44. It is secured to the end of the suction nozzle against undesirable movement by the bracket members 46. Secured by suitable means to the cross braces 17, the forward end of the shield 45 and the brackets 42 are the cone shaped members 47. Embracing the sprocket wheel 48 which is permanently secured to the shaft 13 and all of the cone shaped members 47 is the endless chain 49 carrying the lifting and clearing bars 50 ex-

tending outwardly at an angle and forming a V-shaped construction. By this arrangement when the shaft 13 is rotated the chain 49 carrying the bars 50 will slowly pass in front of the suction nozzle 46, thereby not only acting as a screen for preventing the entrance of large material to enter and clog the suction nozzle but lifting and carrying large obstructions up and over the shield 45 away from the wheels 27 and 28 and from an undesired point adjacent the suction nozzle. As the chain passes upward and around the shaft 13 this undesirable material will be eventually deposited back of the shaft 13 and between the barge and shaft 13. To aid the bars 50 and endless chain to guide this undesired material to the rear of my machine, I have provided the two guides 51 of angle iron construction, secured to the cross braces 17 and on each side of the bars and chain respectively, as shown in Fig. 1. The agitating wheels 27 and 28 also lift large boulders and the like up on the shield 45 where the chain and bars carry them to the rear in the usual manner. The numeral 52 designates braces for making the complete device more rigid.

By the two driving faces 19 and 21 being comparatively smooth the shaft 13 may slip relative to the pulley wheel 18 when slowed down or stopped by the wheels 27 and 28 or the chain 49 and bars 50 coming in contact with great resistance, thereby preventing any inwardly breakage of the machine.

To operate the device it is merely necessary to allow the weight of the machine to rest upon the material to be obtained through the suction nozzle. Due to the simplicity of operating parts very little power from the prime mover is necessary to operate the device.

Some changes may be made in the construction, arrangement and combination of my improved hydraulic dredging machine without departing from the real spirit and purpose of my invention and it is my intention to cover by my claims any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

I claim:

1. In a device of the class described, a frame, a shaft rotatably mounted in the free end of said frame, two wheels spaced apart and secured on said shaft against rotation relative to said shaft, knives detachably secured to said wheels; said knives each having their heel portions bent inwardly for forcing the material to be obtained toward a point between said two wheels, a projection on each of said knives extending toward the direction the said knives rotate when said shaft is rotated and a prime mover for rotating said shaft.

2. In a device of the class described, a frame, a shaft rotatably mounted in said



frame, two wheels spaced apart and secured on said shaft, a suction nozzle adjacent said two wheels and between the same, a plurality of knives detachably secured to each of said wheels; said knives each having its heel portion bent inwardly for forcing the material to be obtained toward the said suction nozzle and a means for rotating said shaft.

3. In a device of the class described, an elongated frame, a pair of wheels spaced apart and rotatably mounted in the end of said frame, a suction nozzle terminating adjacent said wheels, an endless chain extending around said frame and the open end of said nozzle, a plurality of carrying bars secured to said chain, a plurality of lifting and agitating blades secured to said wheels and extending a considerable distance beyond said carrying bars, and a means for rotating said chain and said wheels.

4. In a device of the class described, an elongated frame, a suction nozzle terminating adjacent the forward end of said frame, an endless chain embracing said frame and the open end of said nozzle, carrying bars on said chain, a pair of wheels spaced apart and rotatably mounted in the forward end of said frame and on each side of said chain having their peripheries cutting a path beyond the path cut by said carrying bars.

5. In a device of the class described, an elongated frame, a pair of wheels spaced apart and rotatably mounted in the end of said frame, a suction nozzle terminating adjacent said wheels, an endless chain extending around said frame and the open end of said nozzle, lifting and agitating blades detachably secure to each of said wheels and extending beyond said endless chain; said blades each having their heel portions bent inwardly for forcing the material to be obtained toward the said suction nozzle, and a means for rotating said chain and said wheels.

6. In a device of the class described, an elongated frame, a pair of wheels spaced apart and rotatably mounted in the end of said frame, a suction nozzle terminating adjacent said wheels, an endless chain extending around said frame and the open end of said nozzle, a plurality of bars secured to said chain and extending outwardly at an angle thereto, two elongated angle arms secured to the top of said frame and on each side of said chain and bars respectively, a plurality of lifting and agitating blades secured to said wheels and extending a considerable distance beyond said bars on said chain, and a means for rotating said chain and said wheels.

CLARENCE R. PENNEY.