

No. 688,338.

Patented Dec. 10, 1901.

E. RISLEY.  
HYDRAULIC DREDGING APPARATUS.

(Application filed Mar. 19, 1901.)

(No Model.)

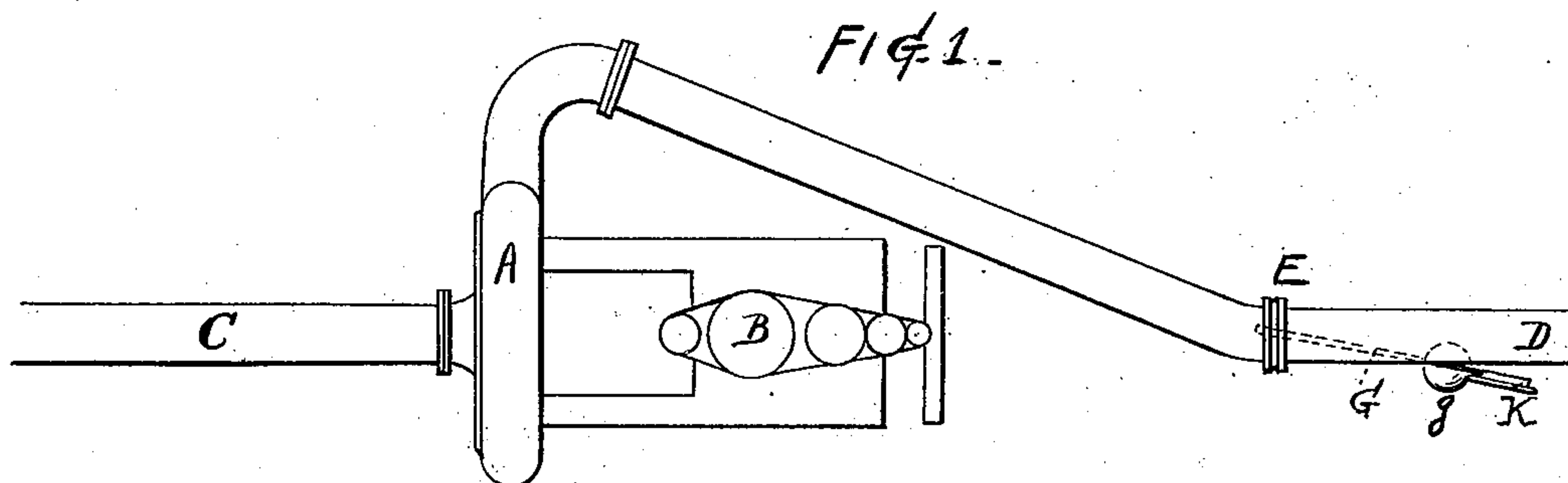
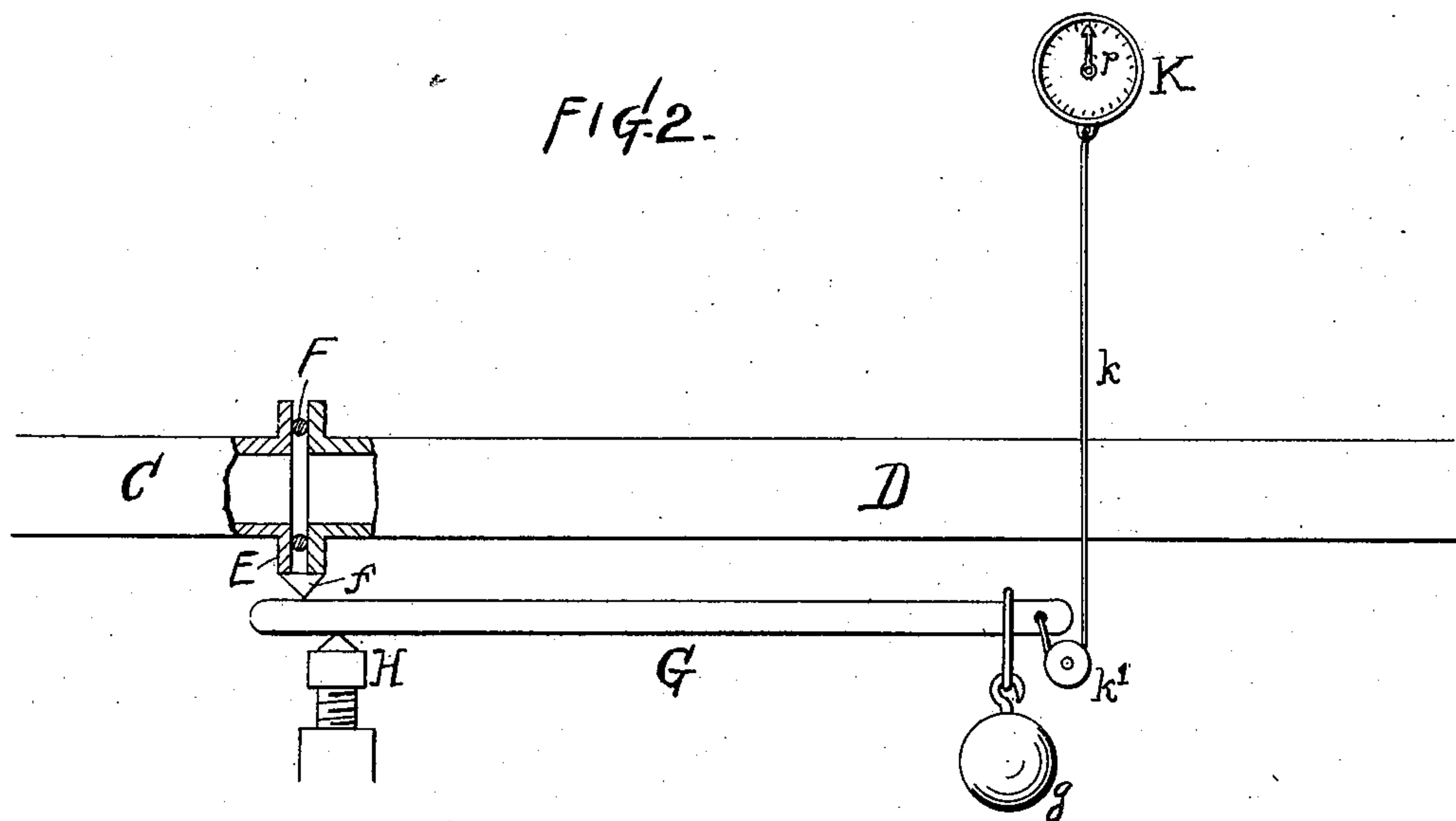
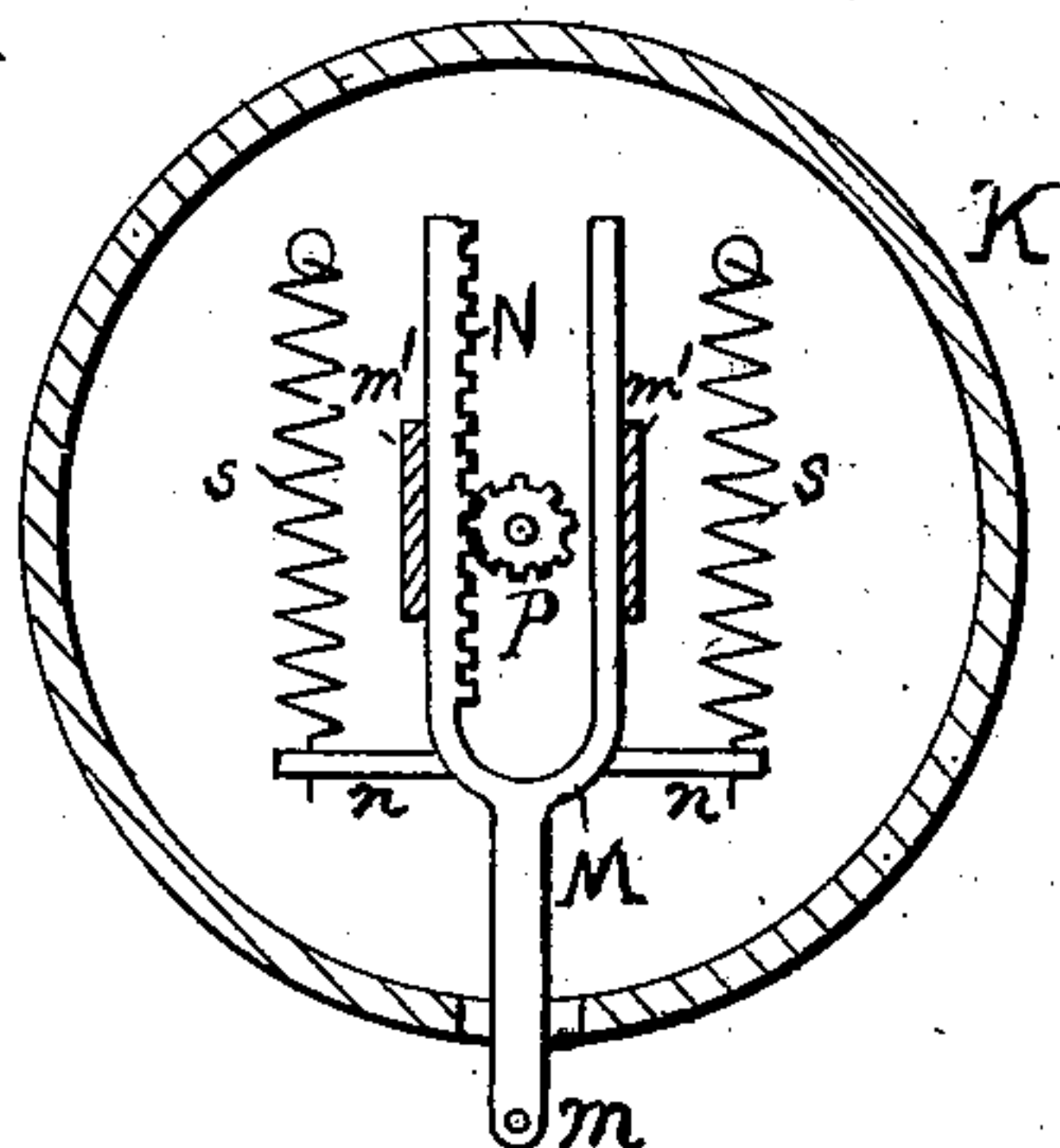


FIG. 3.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

ELTON RISLEY, OF PLEASANTVILLE, NEW JERSEY.

## HYDRAULIC DREDGING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 688,338, dated December 10, 1901.

Application filed March 19, 1901. Serial No. 51,936. (No model.)

*To all whom it may concern:*

Be it known that I, ELTON RISLEY, a citizen of the United States of America, residing in Pleasantville, in the county of Atlantic, State of New Jersey, have invented Improvements in Hydraulic Dredging Apparatus, of which the following is a specification.

In the Letters Patent granted to me February 19, 1901, No. 668,342, for improvements in hydraulic dredging apparatus I have explained how in such apparatus it often happens that the discharge-pipe gets choked by sand or other heavy material settling in the pipe and how the pump, which is usually a centrifugal pump, will keep on running and appear to be working all right while, in fact, pumping little or no material, until a breakdown occurs. I further described how the percentage of sand which can be pumped with the water through the dredging apparatus was necessarily limited, because of this liability or danger of the choking of the pipe. My patented invention consisted in the provision of the dredging apparatus with means for indicating the choking or partial choking of its pipes, and by my said invention the apparatus was enabled to handle at least ten per cent. more material without danger. The specific means set forth in my said patent for carrying my invention into effect consisted of a pivoted blade within the piping of the dredging apparatus and a dial-and-pointer indicating device outside the piping and connected to said pivoted blade, and I described said means as preferably applied to the suction-pipe.

My present invention relates to another means for carrying out my said patented invention and is preferably applied to the discharge-pipe of the dredging apparatus; and it consists of the combination, with a yielding section of the pipe, of means for indicating the weight of the materials or solutions of materials flowing through or contained in such pipe.

In the accompanying drawings, Figure 1 is a plan of sufficient of a hydraulic dredging apparatus to illustrate my invention. Fig. 2 is a side elevation, partly in section, of the weighing means; and Fig. 3 is a view of some indicator details.

In Fig. 1, A is the centrifugal pump, to be

driven by an engine, which is indicated in outline at B. The inlet or suction pipe leading to the pump is shown at C, while the discharge-pipe is shown at D. If my present invention is applied to the discharge-pipe, I provide means whereby a portion of the pipe is made yielding or flexible. As the extent of motion required is but slight—say one thirty-second of an inch—to give the required indicating movement on the dial, a sufficient flexibility can be secured by simply providing between the flanges of one or more of the pipe-joints tolerably heavy rubber packing. Thus rubber packing F of round section from three-eighths to half an inch in diameter placed between the flanges of the pipe-sections at the joint E, Figs. 1 and 2, has been found to answer. I then support the flexible part of the pipe—as, for instance, directly at this joint—upon the end of a long lever G by means of a knife-edge *f*, and to support this lever on a suitable adjustable but stationary knife-edge H the outer end of the long arm of this lever has a counterbalance, such as a weight *g*, sufficient to support the weight of the pipe when full of clear water. To this lever are connected the moving parts of an indicator-dial K by means of a chain or cord *k*, passing around a pulley *k'*. It will thus be seen that excess of weight of material flowing through the pipe above a predetermined amount will be indicated or registered.

The indicator details may be varied without departing from my invention; but in Fig. 3 I have shown a form which may be employed. The chain or cord *k* is to be connected to projecting lower end *m* of the slide M, sliding in fixed guides *m'* on the casing of the indicator. This slide has a rack N, gearing into a pinion P on the axis of the pointer *p*. Springs *s*, connected to arms *n* on the sliding rack and to fixed pins on the casing, tend to pull the slide M upward to keep the pointer *p* opposite any other suitable indication when the water is flowing clear through the pipe.

When the sand flows through or accumulates, the increased weight will actuate the lever G, so as to indicate on the dial when the danger limit is passed and warn the attendant to remedy the trouble, as by raising the suction end of the pipe out of the sand



or mud a little. My present improvement, therefore, will not only indicate the choking or partial choking of the piping, but also serves to show the amount of material being  
5 pumped.

I claim as my invention—

1. In a hydraulic dredging apparatus, a  
• pipe having a flexible or yielding section and  
provided with means operated by the move-  
10 ment of said flexible or yielding section for  
indicating an excess of material above a pre-  
determined amount flowing through the pipe.

2. In a hydraulic dredging apparatus, a  
pipe having a flexible or yielding section and  
15 provided with a counterbalanced lever sup-

porting said flexible section of the pipe and  
operated by the movement thereof, whereby  
a predetermined weight or amount is coun-  
terbalanced, and a dial-indicator actuated by  
the lever, whereby indications above said pre- 20  
determined weight or amount are registered  
or made.

In testimony whereof I have signed my  
name to this specification in the presence of  
two subscribing witnesses.

ELTON RISLEY.

Witnesses:

GEORG W. WREY,  
J. A. CHAMPION.