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N. R. HARRIS.

DREDGER.

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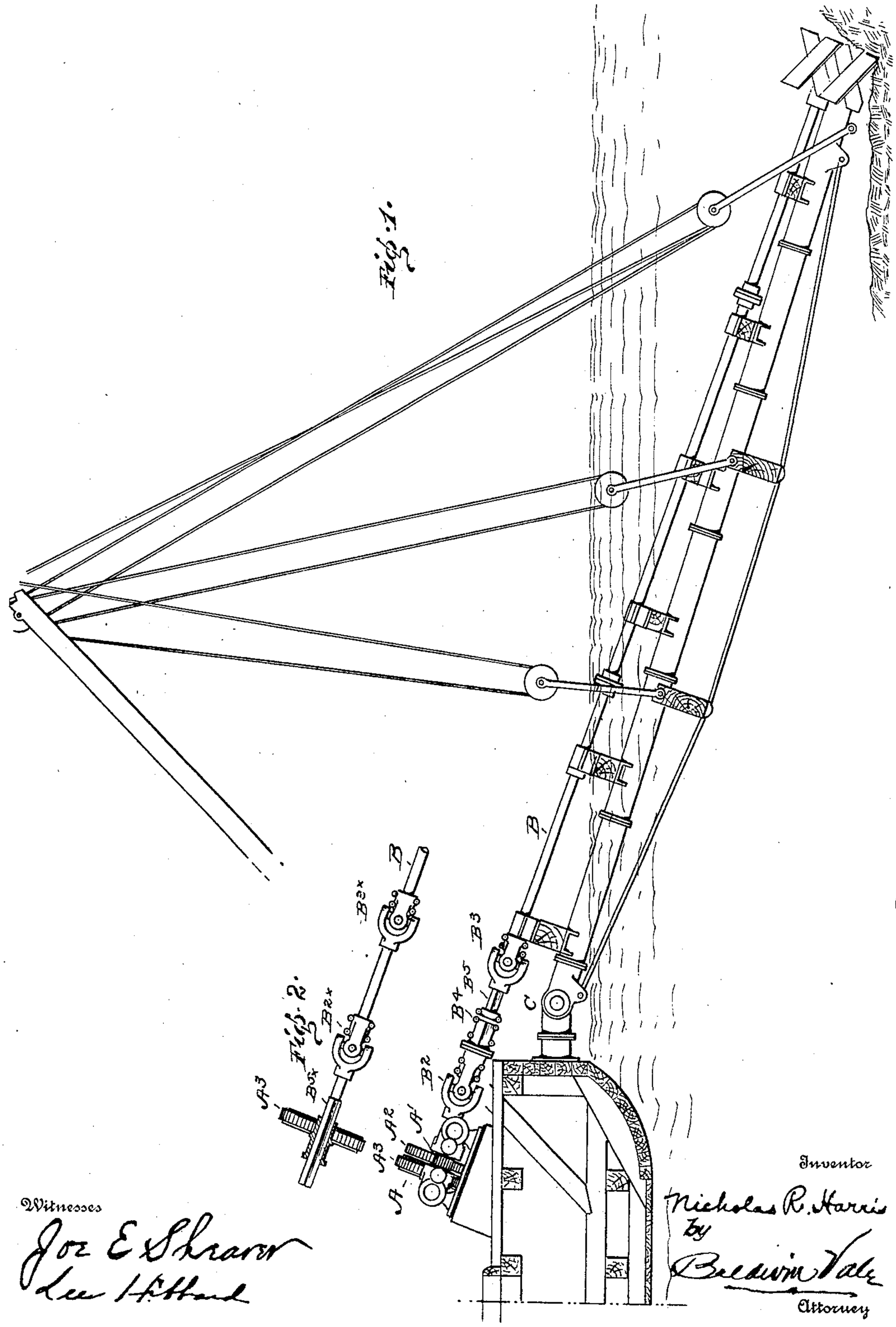

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DREDGER.

No. 814,204. Specification of Letters Patent. Patented March 6, 1906.

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To all whom it may concern:

Be it known that I, NICHOLAS R. HARRIS, a citizen of the United States, residing at 5 Market street, in the city of San Francisco, county of San Francisco, and State of California, have invented certain new and useful Improvements in Dredgers; and I do hereby declare the following to be a full, clear, and exact description of the said invention, such as will enable others skilled in the art to which it most nearly appertains to make, use, and practice the same.

This invention relates to improvements in suction-dredges, and more particularly to the driving mechanism for the cutter thereof; and it consists of the novel arrangement of the parts.

In the dredgers of this class the cutter-head is carried on the extreme end of a driving-shaft mounted upon a boom or ladder suspended from a superstructure and adapted to be raised and lowered. The suction-pipe is also supported by this ladder, the mouth of the pipe extending from behind the cutter-head in a line approximately parallel with the driving-shaft to the bow of the barge. The raising and lowering of the ladder necessitates a swing-joint in the suction-pipe where it enters the dredge and also in the driving-shaft at the pivot of the ladder. Heretofore the pivoting of the driving-shaft has been accomplished by means of a complicated train of gearing of necessity running partially submerged or by mounting the engine and gearing on ladder with swinging joints in steam-pipes, both methods resulting in great wear and tear on the mechanism, loss of power, and the attendant excessive cost of maintenance and repair.

The object of this invention is to eliminate this complication of mechanisms with its attendant disadvantages. In the accomplishment of this object the invention broadly consists in the substitution of universal joints and a telescoping shaft for the gearing at or near the pivotal point of the ladder.

In the drawings, Figure 1 is a side elevation of a dredger constructed in accordance with this invention. Fig. 2 is an alternative construction, showing the slip-joint within the hub of the driving-gear.

In detail this invention consists of the driving-engine A of suitable design set at an angle approximating that of the working angle of the cutter-shaft. The driving-pinion A' on the engine-shaft engages the gear A^2, which in turn is geared back to the gear A^3, which drives the cutter-shaft B. The cutter-shaft is divided at or near the pivot C of the ladder, at which point the slip-joint B', consisting of the universal joints B^2 B^3 and the slide-joint B^4, is inserted. The universal joints are of the usual right-angle or any suitable construction. The slide-joint consists of the sleeve B^4 and square shaft B^5, respectively fixed to the universal joints. The pivot C of the ladder and pivot B^3 of the cutter-shaft being on different centers results in the shortening of the cutter-shaft when the ladder is raised. It is the function of the slip-joint to take up this play of the shaft. It is the function of the universal joints to accommodate the vertical and lateral movements of the cutter-shaft independent of the rotation of the said shaft. By this arrangement of the parts it is obvious that the cutter-shaft is capable of universal action without friction greater than the simple wear and tear on the universal and slip joints, which is trifling compared with the cost and maintenance of a train of gears to accomplish the same functions.

Manifestly the construction can be varied to suit circumstances without departing materially from the spirit of the invention. For instance, the alternative construction shown in Fig. 2 may be substituted. The variation in this instance consists in mounting the driving-gear upon the sleeve of the slip-joint which is journaled in the pillar of the engine-bed frame, thus permitting the slide of the cutter-shaft to play through the hub of the gear. The equivalents are obvious.

Having thus described this invention, what is claimed, and desired to be secured by Letters Patent, is—

1. In a dredger a cutter-shaft mounted upon a swinging ladder, a driving means upon said dredger, universal and slip joints interposed between said cutter-shaft, and the driving means near the pivot of said ladder.

2. In a dredger a cutter-shaft having universal and sliding jointed connection with its driving mechanism.

In testimony whereof I have hereunto set my hand this 6th day of July, 1905.

NICHOLAS R. HARRIS.

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