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R. H. CAMPBELL.

HYDRAULIC LIFT.

APPLICATION FILED DEC. 12, 1903.

NO MODEL.

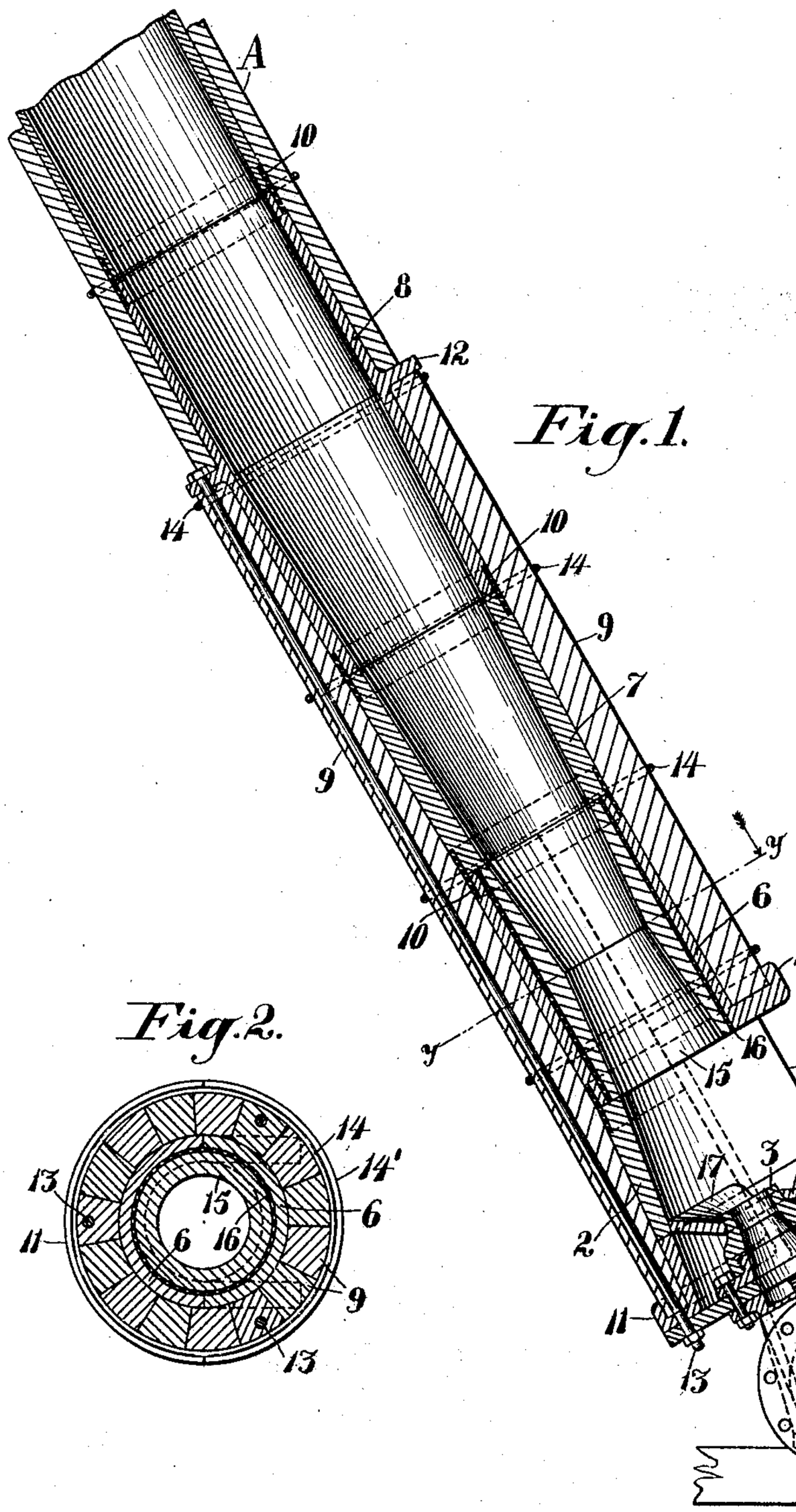

Fig. 1.

Fig. 2.

Witnesses:-
F. C. Fliedner
J. R. Snow

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No. 763,720. Patented June 28, 1904.

UNITED STATES PATENT OFFICE.

REMEMBRANCE H. CAMPBELL, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR OF ONE-HALF TO HARRON, RICKARD & McCONE, OF SAN FRANCISCO, CALIFORNIA, A CORPORATION OF CALIFORNIA.

HYDRAULIC LIFT.

SPECIFICATION forming part of Letters Patent No. 763,720, dated June 28, 1904.

Application filed December 12, 1903. Serial No. 184,850. (No model.)

To all whom it may concern:

Be it known that I, REMEMBRANCE H. CAMPBELL, a citizen of the United States, residing in the city and county of San Francisco and State of California, have invented new and useful Improvements in Hydraulic Lifts, of which the following is a specification.

My invention relates to an improved apparatus for use in placer-mining, and pertains particularly to means employing a hydraulic jet for lifting gravel, tailings, and the like above their original bed and depositing them on a higher level.

The object of my invention is to provide a hydraulic elevator in which individual parts that are subject to most wear can be easily renewed without great difficulty or expense, to distribute and relieve strain on the several parts, and to facilitate the delivery of the gravel, water, and other waste material to the elevator-jet.

It consists of the parts and the construction and combination of parts, as hereinafter more fully described, having reference to the accompanying drawings, in which—

Figure 1 is a vertical central section of my apparatus. Fig. 2 is a transverse section on line *y y*, Fig. 1.

A represents the uplift-pipe, 2 the receiver or base, and 3 the nozzle, through which a jet of water is delivered under a high head to lift the sand, gravel, boulders, and waste water delivered by sluice 4 through an opening 5 to the interior of the receiver. Interposed between the uplift and the receiver is the contracted throat portion of the elevator, composed of the abutting sections 6 7 8 and the outer wooden stave-casing 9.

In ordinary elevator construction it is usual to provide the several sections of the base, throat, and uplift with abutting end flanges and to unite the individual elements by means of bolts and nuts. The objection to this construction is the weight and inflexibility of the apparatus and its inability to adjust itself to shock and strain, resulting in vibration and consequent leakage and fracture of the parts. Furthermore, it has been customary to make the throat-section of one solid piece of metal, which after a certain period of use and wear has to be discarded. The amount of metal thrown away at such times is considerable and the expense and other inconvenience of replacing entire new sections become quite burdensome. My invention contemplates relief in both these directions. Instead of bolting the several sections together the sections are without end flanges and are placed loose end to end, the seam between any two sections being closed by a suitable rubber packing-band 10 and the whole incased by the longitudinally-extending wood staves 9. The lower end of the base-section is provided with an annular flange-socket 11, except in that part below opening 5, as a seat for one end of the staves. The upper throat-section 8 is provided with an annular flange 12 intermediate of its ends to form a seat for the upper ends of the staves, the parts being rigidly united by means of the rods 13, extending longitudinally of the sections between flanges 11 and 12, and by the hoops 14. The latter are preferably disposed opposite the joints of the interior sections. That part of lower throat-section 6 above opening 5 has a segmental flange-socket portion 14′, similar to flange 11 and for a similar purpose. The adjacent ends of the several sections are provided with peripheral annular grooves to accommodate the packing-bands 10, so that when the latter are in position they will not project above the surface of the sections, but will allow the staves to fit close against the sections, as they are intended to do. This loose sectional formation of the lower portion of the apparatus where strain and concussion are greatest affords a certain amount of elasticity and distributes the strain and vibration and practically obviates danger of fracture.

If desired, the uplift may be formed in sections, also incased in wood, as shown.

Provision for economical renewal of parts

most subject to wear is made by furnishing the lowermost throat-section 6 with a removable lining 15, of manganese steel or other suitable hard durable substance. This throat-liner is of substantially the same length as section 6 and is held in place by means of the abutments afforded by the contiguous ends of the base and section 7. Section 6 is divided longitudinally into two complementary sections to permit of the entry of the liner and is of substantially uniform interior diameter throughout its length, but is of less thickness than the adjacent ends of the base and section 7 for the purpose of providing the abutments just mentioned. The liner is cylindrical, and its inner surface converges from each end toward the center to form the contracted throat-passage common in all elevators. The interiors of the base and of the superposed section 7 are in continuation of the corresponding opposite inclines of the liner. Naturally this contracted part of the apparatus is subjected to tremendous strain and abrasion; but by having a removable wearing member of very hard material, like manganese steel, and this member supported by the outer casing-section it may be worn down very thin without any danger to the apparatus or the workmen. Under the old style of elevator these throat portions being in one piece it was not safe to wear them beyond a certain point for fear of their bursting. Strain and shock are further relieved by the interposition of a sheet of rubber or like packing, as 16, between the liner and its incasing section 6.

Under my present construction the sections 6 7 8 may be of ordinary cast-iron.

The nozzle-tip is surrounded by a protective and guide collar 17, fitting the walls of the receiver and having a downwardly-inclined portion 18 toward opening 5 to form a seat for the sluice-plate 4, the portion of the collar within the receiver being inclined radially and upward, so that the feed of gravel, rocks, waste water, &c., will always tend inward toward the jet. The material and waste water to be lifted are thus delivered directly into the path of the jet, and abrasion of the nozzle is thereby greatly reduced, while there is no opportunity for any material to pack around the nozzle in the bottom of the receiver. Practically the whole interior of the receiver is within the active zone of the jet.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a hydraulic elevator, the combination of a series of loosely-arranged alined metal sections provided with peripheral annular grooves adjacent to their ends, packing-bands in said grooves and not projecting beyond the surface of the sections, an exterior sectional wood casing for said sections, certain of said sections provided with annular peripheral flanges and tie-rods extending between said flanges to bind the parts together.

2. In a hydraulic elevator, the combination with the uplift of a series of loosely-arranged alined throat-sections having peripheral annular grooves at their ends, packing-bands contained in said grooves and not projecting beyond the surface of said sections, some of said sections having peripheral integral annular flanges, an outer sectional wooden casing between said flanges and embracing the intervening sections, and means engaging the flanges for uniting the several parts.

3. In a hydraulic elevator, the combination of an uplift-pipe, a receiver-section having a side opening, a nozzle and a throat portion intermediate of the uplift and receiver and comprising a series of loosely-arranged alined sections, a removable throat-liner, an exterior flexible casing for said sections, and means for bringing the several parts rigidly together.

4. In a hydraulic elevator, the combination with the uplift, of a receiver-section therefor, a nozzle, said receiver having a side opening, a sluice-infeed, and a collar surrounding the nozzle and engaging the sides of the receiver, and adapted to direct the material into the path of the jet, said collar having a portion adjacent the receiver-opening inclined downwardly relative to the rest of the collar and providing a seat for the end of said sluice.

5. In a hydraulic elevator, the combination of an uplift, a receiver-section, a longitudinally-divided throat-section, a removable liner for said throat-section, and a cushion between the adjacent surfaces of the section and lining.

6. In a hydraulic elevator, the combination of an uplift, a receiver-section, a throat portion intermediate of the receiver and uplift, a removable liner for said throat portion, and a packing between the adjacent surfaces of the throat and lining.

7. In a hydraulic elevator, the combination of an uplift, a receiver-section, a throat portion intermediate of the receiver and uplift, a removable liner for said throat portion, and a rubber packing interposed between the liner and its surrounding throat portion.

8. In a hydraulic elevator, the combination with an uplift and a receiver-section, of a composite throat portion of metal and wood intermediate of the uplift and receiver, and a removable liner of hard resistant material for said throat portion.

9. In a hydraulic elevator, the combination of a receiver-section, a section axially alined therewith, an intermediate section of greater interior diameter than the abutting ends of

either of said other sections, a removable liner fitting within said intermediate section and abutting against the adjacent ends of said other sections, a yielding packing between the intermediate section and the liner and means for holding the several said parts together.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

REMEMBRANCE H. CAMPBELL.

Witnesses:
S. H. NOURSE,
JESSIE C. BRODIE.