G. L. HURST.

ENDLESS CHAIN BUCKET EXCAVATOR.

APPLICATION FILED AUG. 28, 1906.

901,008. Patented Oct. 13, 1908.

Fig. 1.

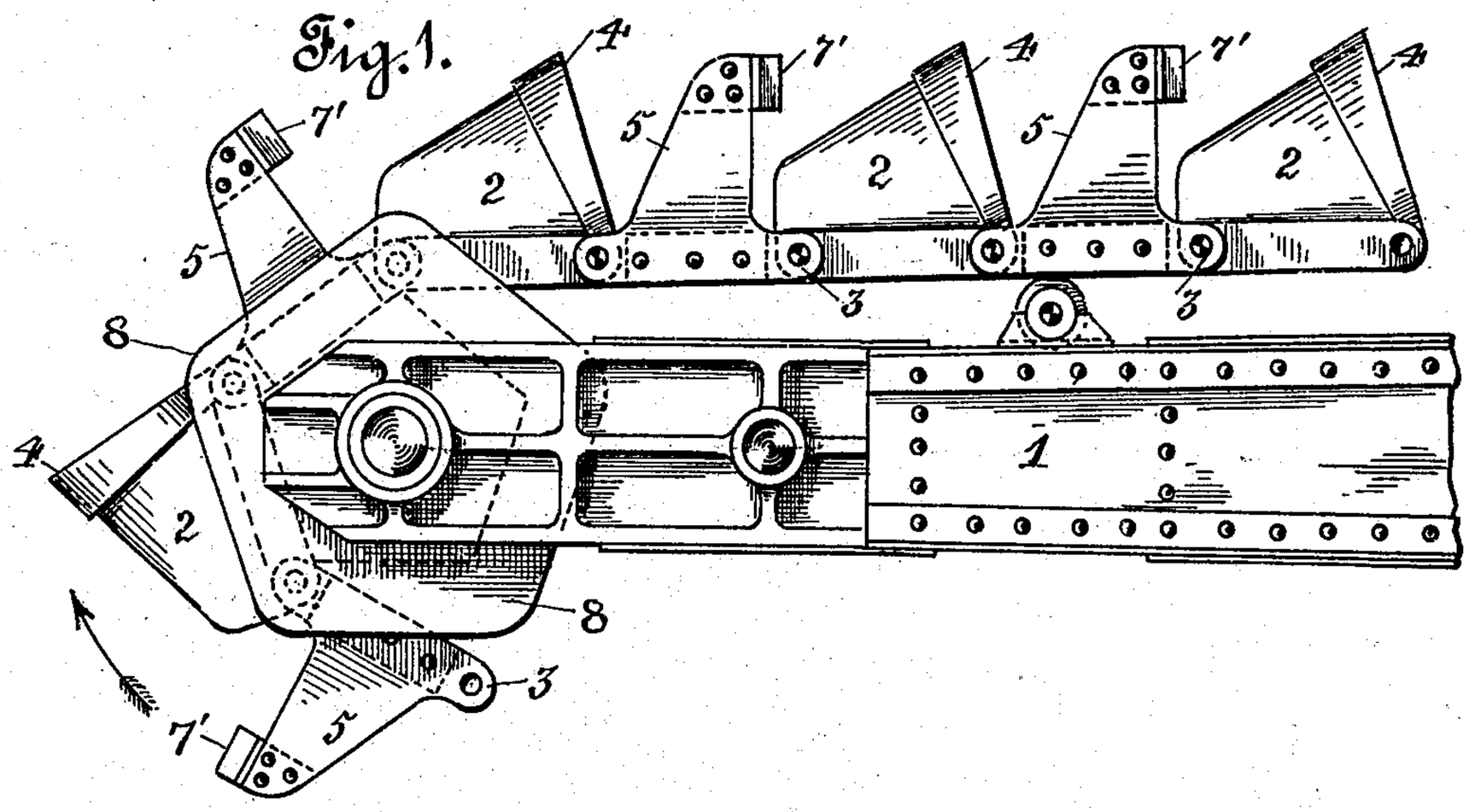


Fig. 2.

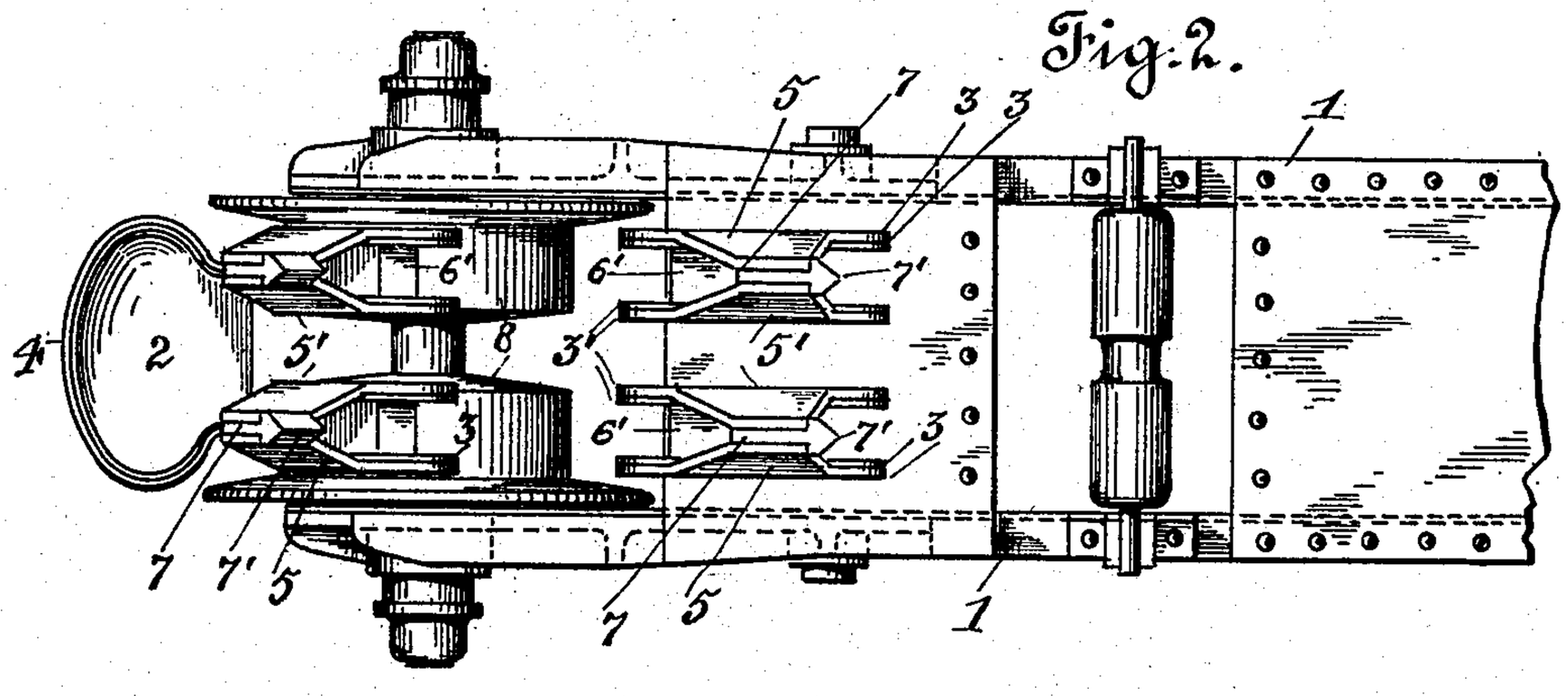
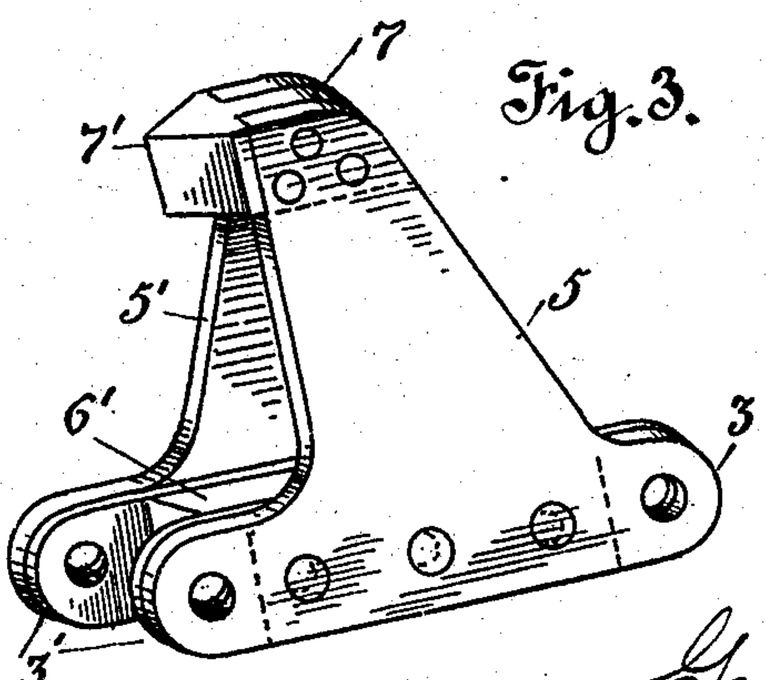


Fig. 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

GEORGE L. HURST, OF SAN FRANCISCO, CALIFORNIA.

ENDLESS-CHAIN BUCKET EXCAVATOR.

No. 901,008. Specification of Letters Patent. Patented Oct. 13, 1908.

Application filed August 28, 1906. Serial No. 332,324.

To all whom it may concern:

Be it known that I, GEORGE L. HURST, a citizen of the United States, residing in the city and county of San Francisco and State of California, have invented certain new and useful Improvements in Endless-Chain Bucket Excavators, of which the following is a specification.

The present invention is more particularly designed for use in connection with that type or class of dredging machinery known as "gold dredgers", or such dredgers as are used to cut the soil, elevate the same, and so treat the excavated and elevated soil as to remove therefrom such precious metal as may be carried thereby. In this class of machinery the soil to be worked is ordinarily cut and elevated by means of an endless chain bucket excavator, the cutting or freeing of the soil being accomplished through the medium of the elevating buckets, which buckets are formed with a cutting lip for such purpose. The result of placing the full cutting of the soil to be removed onto the buckets is to subject the buckets and their connections to a considerable strain, requiring the buckets to be formed of extra strength to resist such excessive strains. As the entire cutting is performed by the lip of the buckets, it is obvious that the utility thereof is considerably shortened.

The object of the hereinafter described invention is to relieve the buckets of the initial cutting of the soil to be displaced, thereby removing from the buckets the severe strains to which they have heretofore been subjected, at the same time reducing the wear of the cutting lip of the bucket to a minimum, thus prolonging the life and usefulness of the buckets and increasing the working efficiency of the excavating mechanism.

To accomplish the above object, there is arranged between each bucket of the endless chain of buckets, one or more diggers or cutting instrumentalities, which serve to give an initial cutting to the soil so as to partially loosen the same immediately in advance of and prior to being acted on by each bucket of the endless chain of buckets.

In order to comprehend the invention, reference should be had to the accompanying sheet of drawings, wherein

Figure 1 is a side view of the swinging ladder of a dredging apparatus with the endless chain bucket elevator arranged thereon, the position of the connecting links for the buckets, with the diggers or cutting instrumentalities being shown, the ladder and the endless chain bucket elevator being partly broken away; Fig. 2 is a plan view of the parts disclosed in Fig. 1 of the drawings; and Fig. 3 is a detail view of one of the connecting links removed, the digger or cutting instrumentality being secured thereto.

The numeral 1 is used to designate the ordinary swinging ladder of a gold dredging apparatus, and 2 the buckets of the endless chain bucket elevator which is supported by and works over the said swinging ladder. The buckets 2 are connected by the members 3—3′ of the connecting links, which connecting links and buckets 2 constitute the elevator of the endless chain bucket excavator. The ends of the links are connected with the buckets by transverse pins 10. The bucket 2 during the working of the dredger receives the material to be worked, elevates the same and discharges the said material into a suitable device for receiving such excavated material. These features and the working thereof are well understood in the art of gold dredgers, and call for no detailed description herein.

To relieve the cutting lip 4 of the excavating bucket 2 of the excessive strains and wear to which it is subjected, means are arranged in advance of each bucket 2, for giving an initial cutting or loosening of the soil prior to the same being acted on by the excavating buckets, in fact, if so desired, the hereinafter described cutting means may serve as the sole instrumentalities for releasing the soil to be removed, leaving the buckets to act as the means for elevating the cut and loosened material.

In the present case, the means for cutting, digging and loosening the material to be elevated in advance of the buckets 2, comprises projecting plates 5—5′, connected with the link members 3—3′. These plates are mounted on the link pins 6, and are held separated by the steel fillers 6′. Between these projecting plates 5—5′, which may more properly be termed the digger plates, and near the outer end portion thereof, a digger or cutting blade 7 is clamped, the cutting point 7′ thereof projecting forwardly at an angle to the plates 5—5′, so as to be in advance of and in line with the travel of the bucket 2. Two such digger or cutting in-

strumentalities are disclosed in advance of each of the said excavating buckets 2, although the number may be increased or decreased at will.

The initial cutting or loosening of the soil is performed in advance of the buckets 2 by means of said diggers or cutting devices 7, thus relieving the buckets of the heavy work of forcing loose the soil as carried over the lower tumbler 8 of the swinging ladder 1, Fig. 1 of the drawings. It will thus be observed that the work of cutting, digging, loosening or breaking up the soil to be removed, is distributed between the initial cutting means and the buckets of the endless excavator, thus removing from the buckets the severe strain to which they have heretofore been subjected.

By the described means for disturbing the soil to be removed and elevated onto a gold dredger to be treated for recovering therefrom the valuable metal carried thereby, the efficiency of the dredge is not only increased, but the endless chain excavator works with greater freedom than where the full cutting strain is placed on the buckets, and again the wear on the buckets is reduced to a minimum, thus decreasing the repair work on the buckets, which is occasioned where the buckets are required to serve as the sole cutting means for the soil to be displaced.

Having thus described the invention, what is claimed as new and desired to be protected by Letters Patent is—

1. An endless chain bucket excavator and elevator, the same including a series of excavating buckets having cutting edges and a series of independent cutting devices having cutting edges arranged to extend directly in advance of and at the same depth as the cutting edge of each excavating bucket, and in the path of travel of said cutting edges of the buckets.

2. An endless chain bucket excavator and elevator, the same including a series of excavating buckets having cutting edges, a plurality of links to connect the buckets, and a series of independent cutting devices secured to the connecting links, said cutting devices having cutting edges extending in advance of and at the same depth as the cutting edges of the buckets, and directly in the path of the travel thereof.

3. In an endless bucket excavator, the combination with a series of elevating buckets, of links for connecting the said series of buckets, of digger plates secured to and projecting from each link in advance of the buckets, and a digger or cutting device secured to and projecting from said digger plates so as to be in line with the travel of the buckets, said cutting device releasing the soil to be removed prior to the same being acted on by the buckets.

4. An endless chain bucket excavator and elevator, the same including a series of excavating buckets connected together and having cutting edges, and cutting devices provided with cutting edges arranged to extend in advance of and at the same depth as the cutting edges of the buckets, and directly in the path of travel thereof.

5. An endless chain bucket excavator and elevator, the same including a series of excavating buckets, a plurality of connecting links arranged in pairs between adjacent buckets, a digger plate projecting from each link and a cutting blade clamped between each pair of digger plates.

6. An endless chain bucket excavator and elevator, the same comprising a series of independent excavating buckets, a series of links connecting a front end portion of one bucket to the rear end portion of an adjacent bucket, and a cutting device secured to each bucket link so that the cutting edge thereof extends in advance of and at the same depth as the cutting edge of the bucket and in the path of travel thereof.

7. An endless chain bucket excavator and elevator, the same comprising a series of independent excavating buckets, a series of links connecting the front end portion of one bucket to the rear end portion of an adjacent bucket, and a cutting device detachably secured to each bucket link provided with a cutting edge extending immediately in advance of and at the same depth as the cutting edge or lip of the bucket and in the path of travel thereof.

8. An endless chain bucket excavator and elevator, the same including a series of excavating buckets, a plurality of connecting links arranged in pairs between adjacent buckets, a digger plate projecting from each link, a spacing member for each pair of links and a cutting blade clamped between each pair of digger plates.

9. An endless chain bucket excavator and elevator, the same including a series of excavating buckets having cutting edges and a series of independent cutting devices having cutting edges arranged to extend in advance of the cutting edge of each excavator bucket and at the same depth as and directly in the path of travel of the cutting edges of said buckets.

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

GEORGE L. HURST.

Witnesses:

JAMES MASON,

HARRY D. ROGERS.