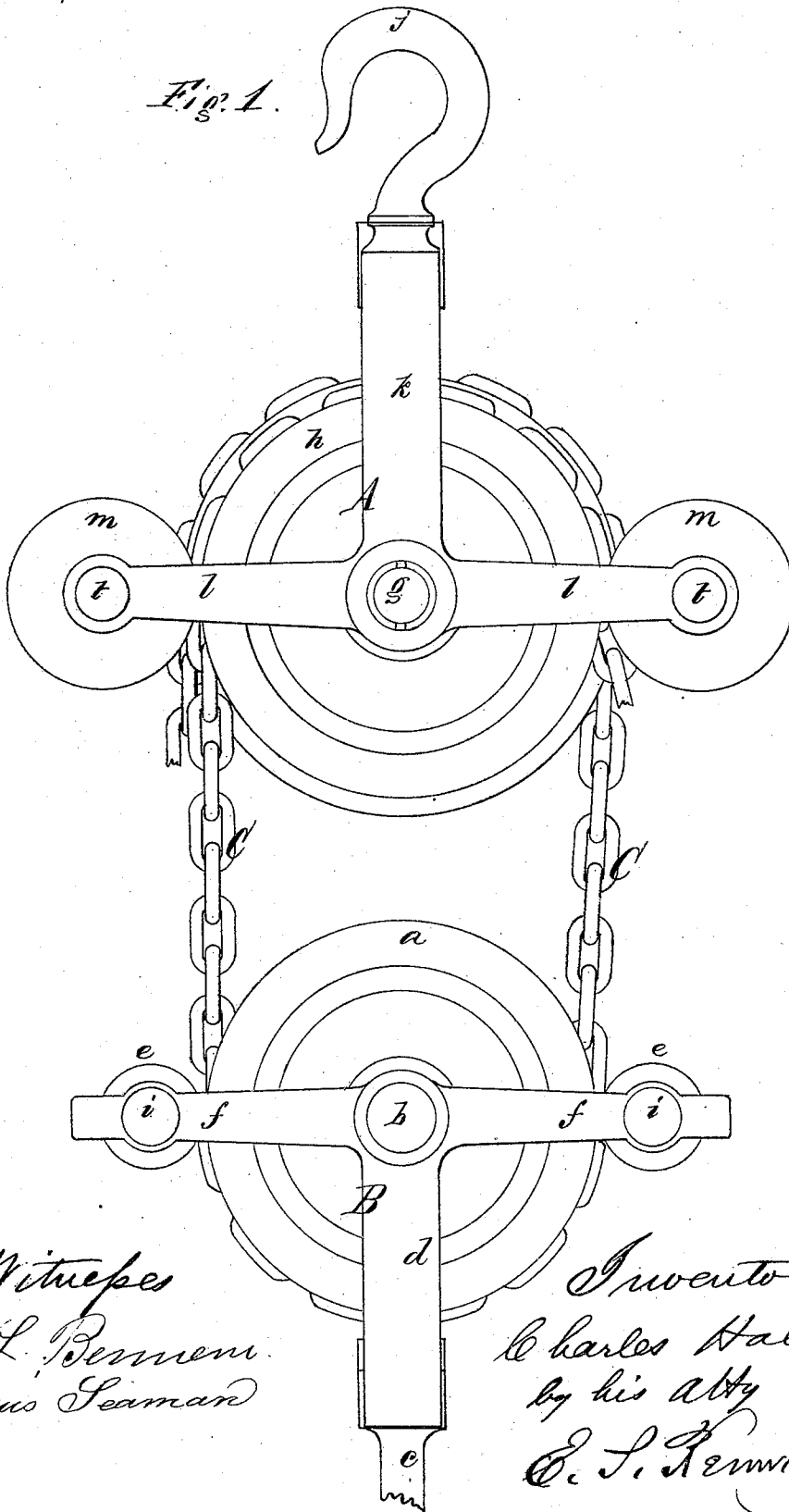


CHARLES HALL.

Improvement in Differential Pulley Blocks.
No. 119,981.

Patented Oct. 17, 1871.

Fig. 1.



Witnesses
W. L. Bennett
Louis Seaman

Inventor
Charles Hall
by his atty
C. S. Kemwick

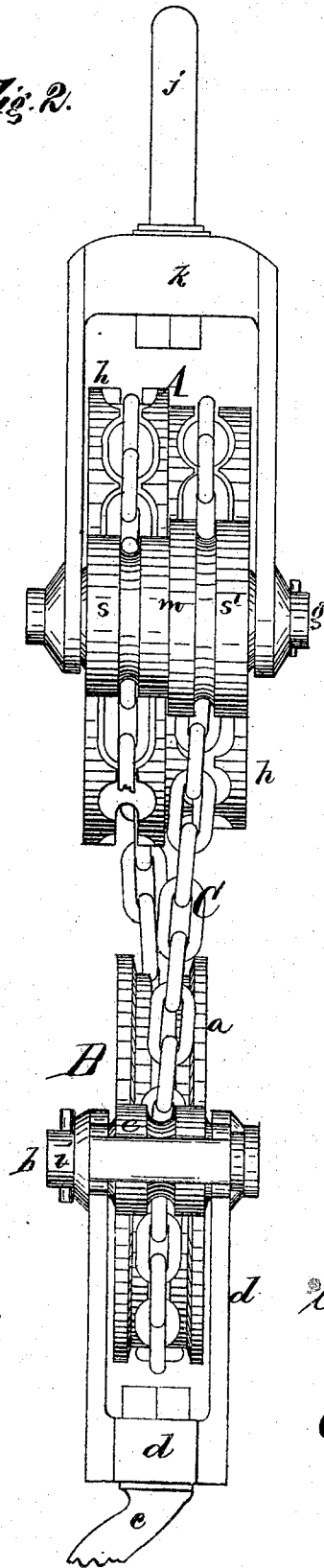
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Fig. 2.



Witnesses
W. L. Penrose.
Louis Seaman

Inventor
Charles Hall
by his atty
C. S. Penrice

UNITED STATES PATENT OFFICE.

CHARLES HALL, OF NEW YORK, N. Y.

IMPROVEMENT IN DIFFERENTIAL PULLEY-BLOCKS.

Specification forming part of Letters Patent No. 119,981, dated October 17, 1871.

To all whom it may concern:

Be it known that I, CHARLES HALL, of the city, county, and State of New York, have made an invention of certain new and useful Improvements in Differential Pulley-Blocks; and that the following is a full, clear, and exact description and specification of the same.

My invention relates to that class of differential pulley-blocks which has grooved sheaves adapted to use short link-chains. Two of the greatest objections to the use of differential pulley-blocks of this description, as constructed previous to my invention, have been the accidental displacement of the chain from the groove of the sheave of the lower block, and the displacement of the chain from the grooves of the differential sheave of the upper block, the latter result frequently taking place by the accidental twisting of the chain by the hand of the operator. The former accident is productive of much loss of time, as the chain must be carefully replaced before the blocks are used. The latter accident is not only productive of loss of time and labor, but often leads to serious results, as the upper sheave either jams by the catching of the chain, or the chain rides on the projections of the groove so as to deprive the operator of the control of the sheave, and consequently of the control of the article raised. The object of my invention is to obviate the said objections; and to this end the first part of my invention consists of the combination of the grooved sheave of the lower block with lateral guide-sheaves secured at the sides of the main sheave so as to guide the chain to the groove of the sheave and hold it there. The second part of my invention consists of the combination of the duplex-grooved differential sheave of the upper block with differential lateral guide-sheaves, which perform the same duties for the differential chain-grooves of the upper block as the single guide-sheaves do for the lower block.

In order that my invention may be fully understood I have represented in the accompanying drawing a set of differential pulley-blocks embodying my invention.

Figure 1 represents a side view of the said pulley-blocks. Fig. 2 represents an edge view of the same.

The set of differential pulley-blocks thus represented consists of two blocks, A B, connected by an endless link-chain, C. The lower block B has a single-grooved sheave, *a*, which is adapted to receive link-chain, and is connected by a pin, *b*, with the hook *c*. The block frame *d*, connecting the pin *b* with the hook, is constructed with arms *f f* which extend beyond the edges of the sheave and sustain grooved guide-sheaves *e e*, arranged to turn upon suitable pins *i i*. The grooves of these guide-sheaves confine the link-chain C in the groove of the sheave *a* of the block and prevent its displacement. The upper block A has a differential sheave, *h*, constructed with two chain-grooves of different diameters, adapted to receive link-chain. This differential sheave is constructed to turn upon a pin, *g*, which is connected with the hook *j* by means of the block-frame *k*. This block-frame is constructed with arms *l l* which extend laterally beyond the edges of the sheave, and sustain grooved guide-sheaves *m m*. Each of these sheaves has two chain-grooves, which embrace the members of the chain in the two chain-grooves of the differential sheave, so as to hold the chain in its position in the grooves of that sheave and to guide the chain as it enters those grooves. As the sheave *h* is a differential sheave having chain-grooves of different diameters, each guide-sheave is constructed so as to be differential, or with two barrels, *s s'*, of different diameters to adapt the guide-sheave to the differential main sheave *h*. These differential guide-sheaves may be constructed in one piece, or of two pieces, (each constituting a separate guide-sheave,) placed side by side on the same axial pin *t*; but the differential construction of the barrels of these guide-sheaves *m m* is important, whether the guide-sheave be made of two parts or of one, in order that both barrels may be arranged to revolve upon the same axial pin *t*.

I am aware that differential pulley-blocks have been constructed with toothed-wheels, and with cylindrical rollers for holding flat chain-bands in engagement with the teeth of such wheels; but, as such rollers have no lateral bearing upon the chain-bands and do not guide the chain-bands laterally so that they may enter properly into grooves

in the pulley-sheaves, I do not claim them, or the combinations of them with toothed-wheels, as my invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of the short-link chain, grooved sheave, hook, block-frame, and lateral-grooved guide-sheave, substantially as before set forth.

2. The combination of the differential-grooved

chain-sheave, hook, block-frame, and differential grooved guide-sheave, substantially as before set forth.

Witness my hand this 27th day of June, A. D. 1871.

CHARLES HALL.

Witnesses:

E. HUBNER,

JOHN T. LOCKMAN.

(70)