K. M. DAHL.

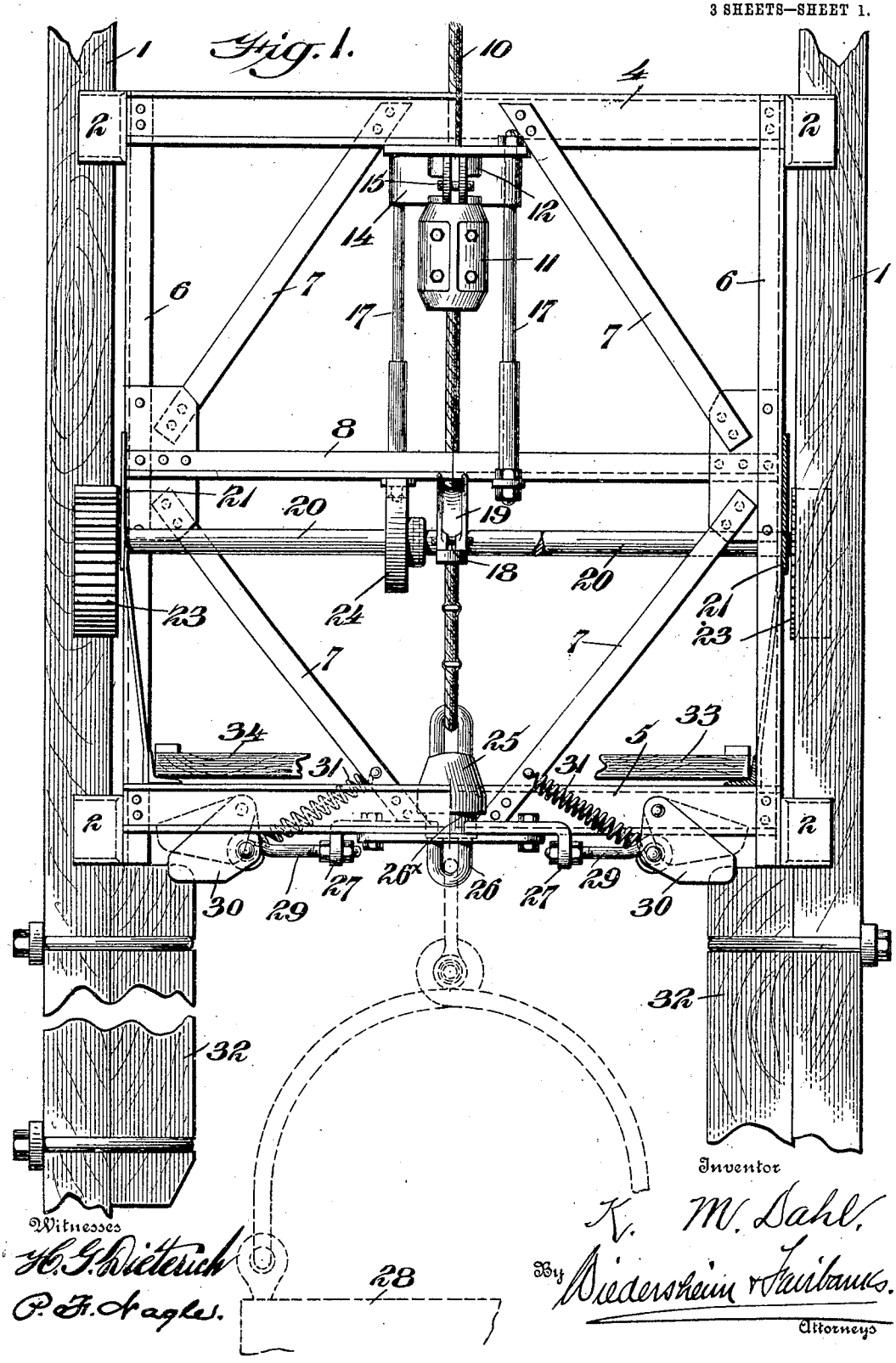
SAFETY CROSS HEAD.

APPLICATION FILED JAN. 9, 1908.

927,774. Patented July 13, 1909.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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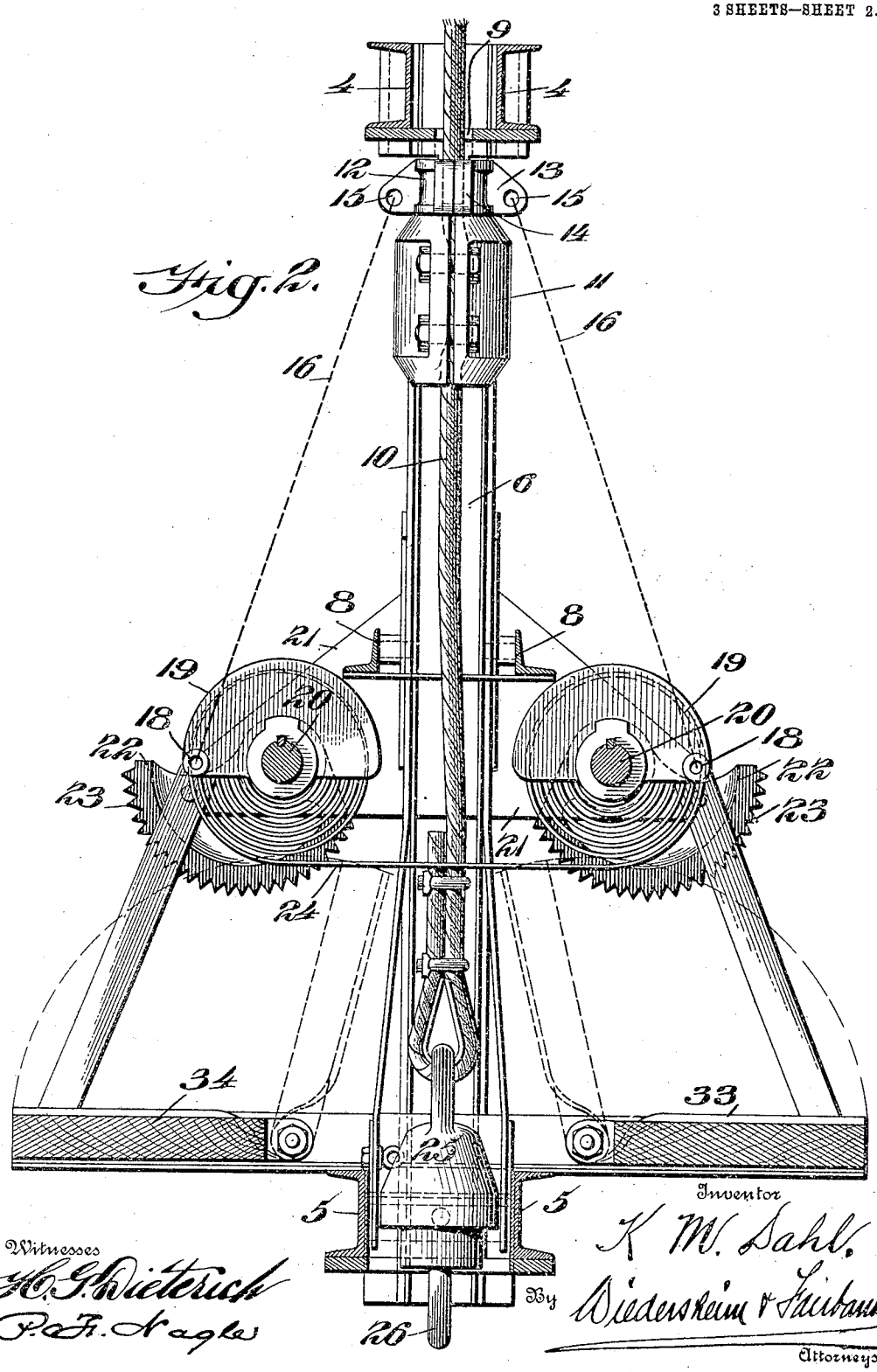
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3 SHEETS—SHEET 2.

Fig. 2.



Witnesses

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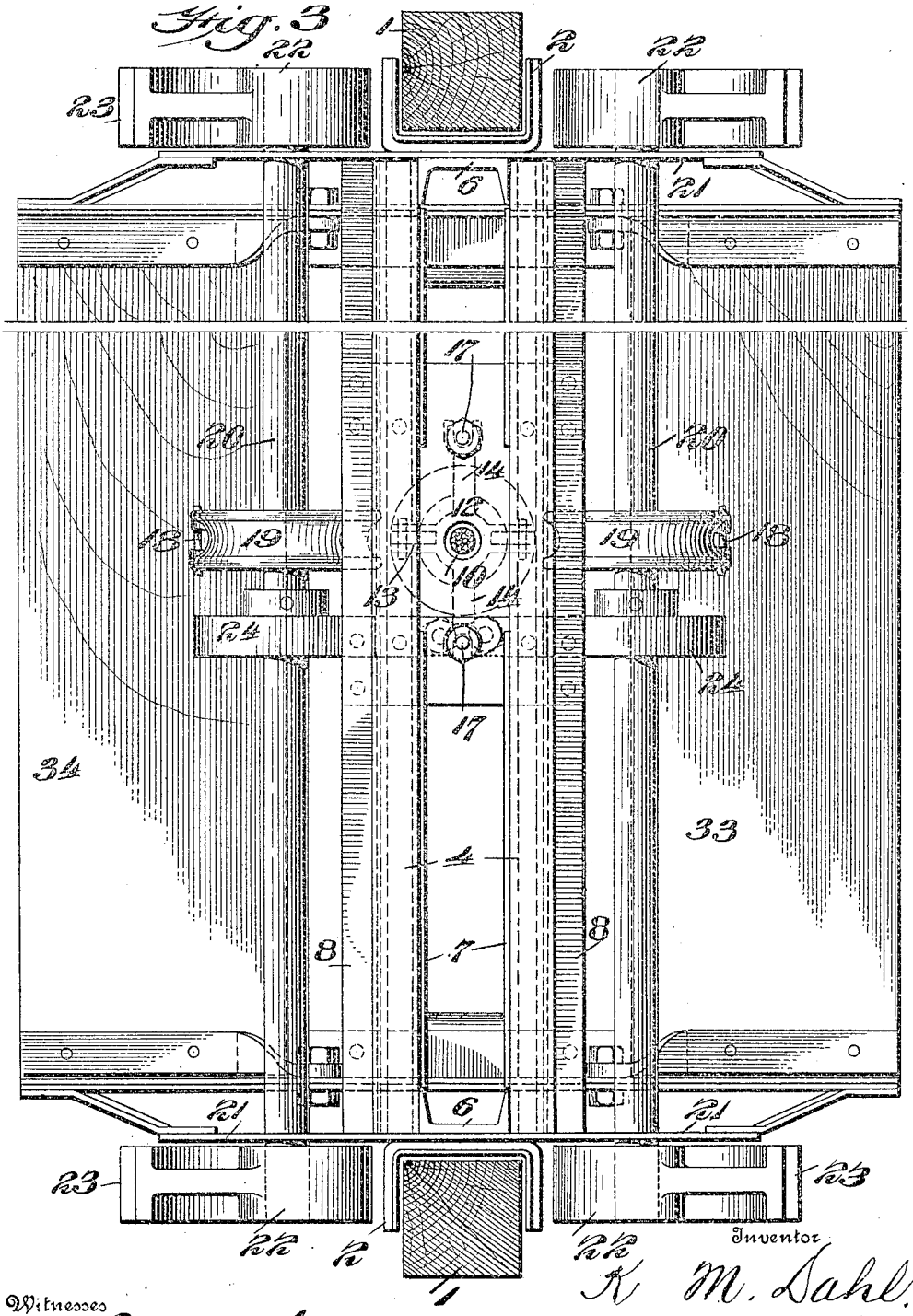
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3 SHEETS—SHEET 3.

Fig. 3



Witnesses

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UNITED STATES PATENT OFFICE.

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SAFETY CROSS-HEAD.

No. 927,774. Specification of Letters Patent. Patented July 13, 1909.

Application filed January 9, 1908. Serial No. 409,990.

To all whom it may concern:

Be it known that I, KNUT M. DAHL, a citizen of the United States, residing at San Francisco, county of San Francisco, State of California, have invented a new and useful Safety Cross-Head, of which the following is a specification.

This invention relates to a safety cross-head of the type used in mine hoists and which is adapted to be raised or lowered into a shaft by cable means, the load being carried by a bucket or other suitable conveyer and has for its principal object a safety locking device, so connected with the cable mechanism as to be normally inoperative but which immediately comes into operation should the cable break or the cross-head become otherwise detached.

My invention further consists of other novel features of construction, all as will be hereinafter fully set forth.

Figure 1 represents an end elevation of a cross-head embodying my invention. Fig. 2 represents a side elevation thereof partly in section. Fig. 3 represents a top plan view of the same.

For the purpose of illustrating my invention, I have shown in the accompanying drawings, a preferred embodiment thereof, which gives in practice satisfactory and reliable results, although it is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized and that my invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown.

1 designates suitable guides spaced apart and located in a suitable manner, as for example, along the side walls of a mine shaft and serving to maintain the hoisting apparatus in correct position during its travel.

Adjacent the guides 1 are coöperating guide clips 2 secured to the frame work of the cross-head which consists of upper and lower double cross-beams 4 and 5 connected by uprights 6 and securely braced by members 7 and 8. The frame of this cross-head may be made of any suitable material but preferably of metal and as shown, the cross-beams 4 and 5 in the form of channels are braced by stiffening bars 7 and angles 8. In the present instance the cross-beams 4 are spaced apart and have a beam or plate secured to their lower portion which plate has an opening 9 through which and between the cross-beams 4 passes the cable 10 to which is secured, preferably adjustably, the clamp 11 adapted to engage a sleeve member 12 which is located below the members 4 and seats on the clamp 11 and is provided with ears 13 and 14, the former 13 of which have apertures 15 to receive ropes or chains 16, while the latter 14 are adapted to be engaged and guided by bolts 17 from the cross arms 8. It will be apparent that any movement of the clamp 11 will be communicated to the sleeve 12 and as the top cross-bars 4 of the frame work rest directly thereon, the entire cross-head will be raised or lowered. The chains 16 are connected at the end 18 opposite from the sleeve 12 to sheaves 19 keyed or otherwise mounted on shafts 20 which are journaled in side bars 21 suitably secured to the uprights 6. These shafts 20 also carry cams 22 provided with gripping teeth 23 which are adapted in emergency to engage the guides 1 and serve as locks to prevent movement of the cross-head. Normally the cams 22 are held out of engagement with the guides 1 by means of the chains 16 against the tension of a coil spring 24 also secured to the shafts 20 and partially coiled on each. Should the hoist cable break or other accident occasion the tension chains 16 to loosen, the spring 24 immediately revolves the shafts 20 and throws the teeth 23 of the cams 22 against the guides 1 and thus locks the cross-head.

The lower cross-beams 5 are spaced apart to permit the passage of a coupling head 25, attached to the cable 10, and which carries a link 26 adapted to support the conveyer bucket 28. It will be noted that the coupling head is, as here shown, provided with a circumferential offset $26^{\times}$ adapted for coöperation with locking fingers 27 slidingly mounted on the lower beams 5 and suitably connected by bolts 29 or the like to pawls 30 pivoted to the cross-head. Springs 31 are mounted on a suitable portion of the cross-head structure and are attached to the respective pawls 30 and normally hold the fingers 27 beneath the offset $26^{\times}$ to prevent releasing of the bucket in case of the cable breaking.

On the guides 1 are blocks 32 which are adjustably secured thereto and positioned in the path of the pawls 30, so as to engage the latter and swing them against the tension of the

springs 31 thus withdrawing the fingers 27 from the bucket supporting means. Additional conveyer means may be provided in the shape of a platform, which is here shown as consisting of hinged members 33 and 34 suitably secured to the cross-head frame and adapted to be swung out of the way, as shown in dotted lines in Fig. 2, when not in use.

From the above description it will be clear how the device operates.

The cross-head is held in position in the shaft by means of the clips 2 engaging the guides 1 and rests on the sleeve 12 which is seated on the cable clamp 11 with the chains 16 taut and holding the cam teeth 23 out of engagement with the guides 1 and against the tension of the springs 24. In the lowering or raising operation should the cable 10 break, the clamp 11 drops, releasing the bushing 12 and chain 16 which allow the springs 24 to retract and throw the cams 22 into gripping engagement with the guides 1 and thus stop and lock the cross-head in its fall. It will be noted in the event of a broken cable, that the guide bolts 17 serve to maintain the sleeve correctly positioned, during the initial dropping movement, and permit equal tension being exerted by the spring upon each shaft resulting in an instantaneous and forceful turning movement of each sheave to throw the cam members into gripping engagement with the said guides. The blocks 32 are located at a point where it is desired to release the bucket and as soon as the pawls 30 come into contact therewith the fingers 27 are withdrawn from the path of movement of the coupling head 25 and the bucket and cable may be lowered as desired, independent of the cross-head.

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

1. In a device of the character described, a cable, a clamp secured thereon, a cross-head, a plurality of guide bolts carried by said cross-head, a support for said cross head slidingly carried on said guide bolts and mounted on said clamp, a plurality of guides for said cross-head, shafts carried by said cross-head, cams on said shafts adjacent said guides, a spring secured to and partially coiled on each shaft, a sheave secured to each shaft and connecting means between each sheave and cross-head support to normally hold said spring inoperative and said cams out of engagement with said guides.

2. In a device of the character described, a cable, a clamp secured thereto, a cross-head, a plurality of guide bolts carried by said cross-head, a sleeve mounted on said clamp and adapted to support said cross-head, ears on said sleeve for sliding engagement with said guide bolts, a plurality of guides for said cross-head, cams secured to said shafts adjacent said guides, a spring secured to and partially coiled on each shaft, a sheave keyed to each shaft, and connecting means between each sheave and cross-head sleeve to normally hold said spring inoperative and said cams out of engagement with said guides.

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