Sept. 16, 1924. 1,508,664

F. F. MIZE

TRAVELING BLOCK

Filed Oct. 22, 1923

Fig. 1.

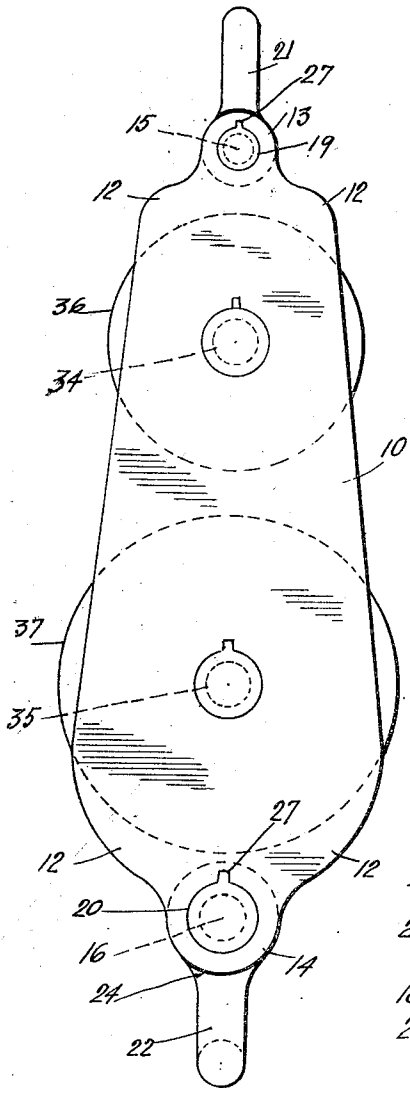


Fig. 2.

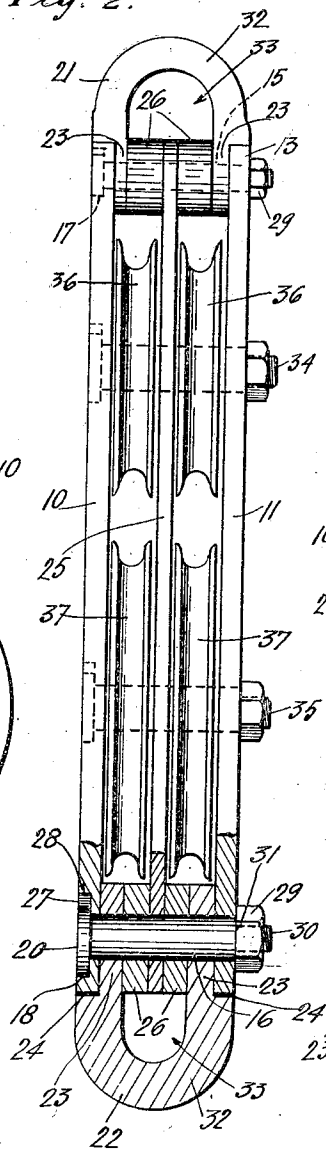
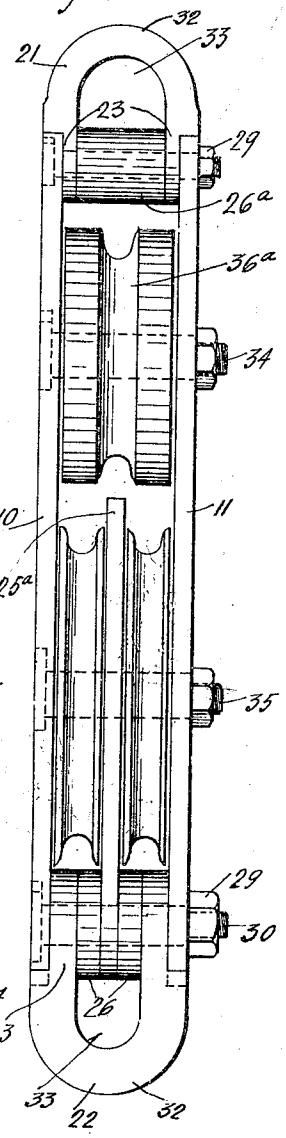


Fig. 3.



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UNITED STATES PATENT OFFICE.

FRANK F. MIZE, OF SEAL BEACH, CALIFORNIA.

TRAVELING BLOCK.

Application filed October 22, 1923. Serial No. 669,937.

To all whom it may concern:

Be it known that I, FRANK F. MIZE, a citizen of the United States, residing at Seal Beach, in the county of Los Angeles and State of California, have invented new and useful Improvements in Traveling Blocks, of which the following is a detailed specification.

This invention relates to blocks, and more particularly to that type of block adapted to be attached to and hoisted with the weight or work. Such blocks are commonly known as "traveling" or "running" blocks.

While the invention may be advantageously applied to blocks used for different purposes and in many and various situations, it is of special value in connection with blocks used in handling of drill pipe and well casing. Therefore, I will describe the invention as applied to such use, explaining its advantageous features in connection with this particular application, without intending to infer by this reference to a specific application that the invention is in any way restricted to such limited use.

Traveling blocks as used in oil well derricks or rigs are suspended by cables from an overhead crown block, and due to the tremendous weight they are called upon to support and the excessive stresses and strains to which they are subjected, must necessarily be massive and of extremely heavy construction. Their over-all length often exceeds five feet, while their width may be as great as twenty or more inches. Their width is determined by the number of side by side sheaves provided, and this number usually ranges about four, as the great weight of the work requires that the hoisting cable be rove through the block several times.

Such blocks therefore take up a considerable space and are so bulky as to width that they often greatly impede the work of setting and withdrawing casing of pipe, by accidentally contacting with and catching on the derrick structure platforms, rigging, etc. Thus the derrick man, who stands on the "stabbing board" to attach and detach the elevator, carried by the block, to stands of pipe or casing, is often called upon to guide the block out of the way of such obstructions during vertical movement of the block. This is done at great peril to the derrick man, as his fingers are very liable to be drawn into the sheaves by the traveling cable. Should he fail to properly guide the blocks over these obstructions, great damage may be caused to life and property.

Therefore, it is one of the principal objects of this invention to provide a block which has the necessary strength and rigidity, and carries the requisite number of sheaves for the task in hand, and yet is of greatly reduced width. This I accomplish by arranging the sheaves "in tandem," or in other words, provide a plurality of vertically spaced sheave pins, each pin carrying one or more of the sheaves so the effective width of the block is reduced to an amount equal only to the total width of the sheaves on a single pin or normally to at least one-half the width of the usual block having the same number of sheaves. Since the cable parts from the lower sheaves must ordinarily pass outside the cable parts from the upper sheaves, the sheaves on the various pins are of differential diameter, each sheave on a given pin being of larger diameter than that of the sheaves on the pin next above.

By reason of the "tandem" arrangement of the sheaves, the line of cable draft is much more nearly central than in the case where all the sheaves are side by side, and the consequent reduction of side draft greatly reduces the wear on cable and sheaves.

Ordinarily, traveling blocks have numerous protuberances and lateral shoulders extending outwardly from their cheek plates, and usually there is a distinct shoulder formed between the ends of the cheek plates and becket shanks. These protuberances and shoulders, during vertical movement of the blocks, are continually catching over and beneath cross planks, platforms and various other extraneous bodies in the derrick, a hazard to be continually guarded against. I overcome these objectionable features by providing the cheek pieces in the form of plates having counter bores to receive the sheave pin heads, so these heads may lie flush or below the outer side faces of the cheek pieces. Then I so form the beckets and attach them to the cheek pieces in such manner that the outer side faces of the beckets merge into the outer side faces of the cheek plates to eliminate all projecting shoulders therebetween; the ends of the beckets preferably being rounded whereby the ends of the block as a whole, are guided over obstructions which may extend in their path and loose obstructions are guided over the ends of the block.

I have also constructed the block in such a manner that it may be easily disassembled and reassembled, and preferably provide a plurality of interchangeable sheaves of varying diameter and face widths, so the sheave combination may be altered to meet various hoisting situations.

Other objects and features of novelty will be set out in the following detailed description, reference being had to the accompanying drawings, in which:

Fig. 1 shows an improved block in elevation;

Fig. 2 is a side elevation of Fig. 1, the lower end of the block being broken away medially to show the becket mounting in section; and

Fig. 3 is a view similar to Fig. 2, but entirely in elevation and showing the substitution of a single upper sheave for the two shown in Fig. 1.

At the outset, I wish to state that while I have shown two sets of sheaves in vertical alinement and have illustrated a certain method of mounting the sheave pins in the cheek pieces, I have made this showing merely as illustrative of the invention, and I may vary the number of sheave pins and sheaves, change the proportional dimensions of the sheaves on a single pin, or of the sheaves on the several pins, or provide other types of pin mounting, without departing from the scope of the broader claims appended hereto.

Throughout the drawings, numerals 10 and 11 designate cheek-pieces or plates which are rounded near their extremities at 12 and terminate arcuately at 13 and 14. Terminals 13 and 14 are concentric with the axes of upper and lower becket pins 15 and 16, respectively, which pins pass through axially alined bores in the cheek-plates, the plates 10 counterbored at 17 and 18, so the pin heads 19 and 20, respectively, may lie flush with, or below, the outer side face 10^a of plate 10. Preferably, the peripheral faces of heads 19 and 20 fit snugly within counterbores 17 and 18, respectively, so the heads aid in resisting the shearing stresses between plates and pins.

The outer side faces of beckets 21 and 22 merge into the outer side faces of the cheek plates and are flush with said plate faces at their point of juncture. The becket has spaced legs 23 which are inset from the outer side faces of the beckets, and these legs bear against the inner side faces of the cheek plates, being provided with axially alined bores to receive the becket pins. Shoulders 24, formed by insetting legs 23, are arcuate and concentric with the becket pins, so the beckets may have limited pivotal movement about their respective pins.

A partition plate 25, preferably coextensive with, and of the same outline as the cheek plates, is suitably bored to receive the pins 15 and 16, and plate 25 is laterally positioned between legs 23 by spacers 26 on the becket pins.

Pin heads 19 and 20 may be provided with such means as lugs 27, fitting in complementary notches 28 in plates 10, to prevent rotative movement of the pins so nuts 29 may be threaded on the threaded pin extremities 30, which extremities are preferably of reduced diameter to provide shoulders 31 for engagement by the nut, to prevent the nuts from being drawn against plate 11 with sufficient force to pinch the cheek plates, becket legs and spacers too tightly together.

Sheave pins 34 and 35 are preferably of the same construction as the becket pins, and are mounted in the cheek and partition plates in a manner similar to that of said becket pins. Therefore, the construction and mounting of pins 34 and 35 need not be discussed. The drawings plainly illustrate that these pins do not project beyond the outer side face of plate 10.

It will be noted that becket loops 32, which define the eyes 33, are of such shape as to guide the ends of the block over obstructions in the path thereof, and since there are no protruding shoulders between beckets and cheeks, and since the beckets and pin heads lie flush with or below one of the outer side faces of the cheek plates, there are no exposed shoulder surfaces at one side of the block to catch on obstructions during vertical travel of the block. In derricks or rigs, the "stabbing board" and other obstructions liable to extend into the path of the traveling block, are usually all at one side, of the derrick, and the hoisting cable will, of course, be initially rove through the block in a manner to bring cheek plate 10, that is, the one carrying the pin heads, facing the obstructed side of the derrick. In certain situations, it may be desirable that both sides of the block be uninterrupted by projections, and in such cases, nuts 29 may be set in recesses provided in the outer side face of plate 11, the threaded ends of the pins being cut off flush with said face. A spanner, socket wrench, or like tool will then serve to thread the nuts on and off the pins.

Pins 34 and 35 are preferably in vertical alinement with becket pins 15 and 16, and in Fig. 2, I have shown two sheaves 36, of equal diameter, rotatable on pins 34, and positioned on opposite sides of partition plate 25; and two sheaves 37 of equal diameter rotatable on pin 35 and positioned on opposite sides of plate 25. Sheaves 37 are shown to be of greater diameter than sheaves 36, so the cable parts running upwardly from the lower sheaves are held clear of

the cable parts trained upwardly from the upper and smaller sheaves. However, it is apparent, in accordance with different methods of reeving cable through the crown and traveling blocks, I may vary the differential diameters of the two sets of sheaves, or vary the relative diameters of the sheaves on a given sheave pin, without departing from the scope of my claims.

By the "tandem" arrangement of the sheaves, I gain two advantages. First, I am able to provide a narrow block having the same mechanical advantage as though all the sheaves were arranged side by side; and second, the cable draft is maintained approximately centrally of the block. This decrease of cable side draft as compared with the draft existing when a usual multiple sheave block is used, is an important feature, for it materially lessens the wear on both sheaves and cables. When work of a lighter nature is to be performed, I may first disassemble the block, and then reassemble it after substituting a different set of sheaves, spacers and partition plates as shown in Fig. 3. Thus a single sheave 36^a is substituted for the two sheaves 36, a partition plate 25^a, extending only to about the periphery of sheaves 37 is substituted for plate 25, and a single spacer 26^a is substituted for the two spacers 26 on becket or draft pins 16. Similary, a greater or smaller number of sheaves may be substituted for sheaves 37 on pin 35. In fact, the sheave combination may be changed at will, within reasonable limits, to meet the various hoisting conditions which arise.

While I have illustrated and described a preferred embodiment of my invention, I do not wish to be limited thereto except for such limitations as a fair interpretation of the appended claims may import.

Having described a preferred form of my invention, I claim:

1. A traveling block embodying cheek pieces, sheave pins supported by the cheek pieces, sheaves on the pins and between the cheek pieces, becket pins extending between the cheek pieces near their ends, and beckets on the becket pins and having their outer side faces flush with the outer faces of the cheek plates.

2. A traveling block embodying cheek pieces, sheave pins supported by the cheek pieces, sheaves on the pins and between the cheek pieces, becket pins extending between the cheek pieces near their ends, and beckets having inset legs extending between the cheek pieces, said legs being apertured to receive the becket pins for holding them to the cheek pieces, the outer side faces of the beckets being flush and co-extensive with the outer faces of the cheek plates.

3. A traveling block embodying cheek pieces, sheave pins supported by the cheek pieces, sheaves on the pins and between the cheek pieces, becket pins extending between the cheek pieces near their ends, beckets having inset legs extending between and in engagement with the inner faces of the cheek pieces, said legs being apertured to receive the becket pins for holding them to the cheek pieces, the outer side faces of the beckets being flush and coextensive with the outer faces of the cheek plates, and spacers on the becket pins between the inset legs.

4. A traveling block embodying cheek pieces, sheave pins supported by the cheek pieces, sheaves on the pins and between the cheek pieces, becket pins extending between the cheek pieces near their ends, the ends of the cheek pieces being arcuate and concentric with the axis of the becket pins, beckets, legs inset from the outer side faces of the beckets and pivoted on the becket pins between the cheek plates, the outer side faces of the beckets being flush with the outer side faces of the cheek plates, and the shoulders formed between said becket faces and said legs being complementary to the arcuate ends of the cheek plates.

In witness that I claim the foregoing I have hereunto suscribed my name this 13th day of October, 1923.

FRANK F. MIZE.