

(No Model.)

J. HÖFER.
SLED.

No. 522,060.

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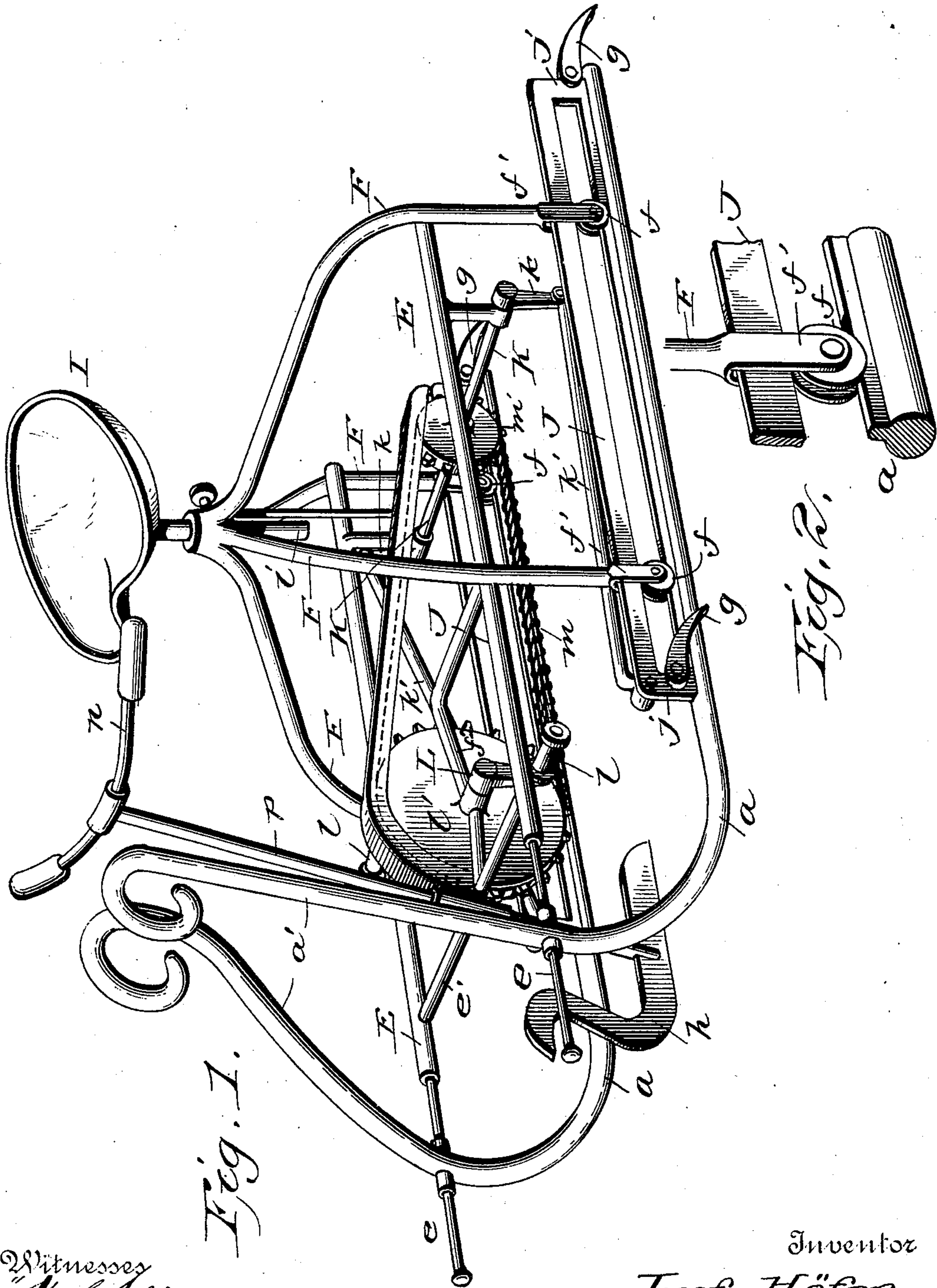


Fig. 1.

Fig. 2.

Witnesses
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To all whom it may concern:

Be it known that I, JOSEF HÖFER, a subject of the Emperor of Austria-Hungary, but having declared my intention to become a citizen of the United States, residing at Sheboygan, in the county of Sheboygan, State of Wisconsin, have invented certain new and useful Improvements in Sleds; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to sleds which are propelled by manual power after the fashion of bicycles and velocipedes.

The object of the invention is the provision of means whereby the sled is advanced by a step by step movement approximating the gait of a living object.

The improvement consists essentially of movable runners provided with dogs which engage with the ice and prevent retrograde movement of the said runners. Also in mechanism for alternately advancing the said runners.

The improvement also consists of the novel features and the peculiar construction and combination of the parts which will be hereinafter more fully described and claimed and which are shown in the annexed drawings, in which—

Figure 1 is a perspective view of a sled embodying the invention. Fig. 2 is a detail view of the lower end of one of the frame bars showing the relation of the runner and the guide bar attached thereto on a larger scale.

The side bars E of the frame have guide rods *e* projected forward from their front ends to pass through suitable openings in the horns *a'* of the runners *a*. These side bars E are connected by cross rods *e'* and the frame bars F which converge and come together at their upper ends and form a socket to receive the seat post *i* of the seat I. The lower flat ends *f'* of the frame bars F are provided with grooved rollers *f* which are designed to travel on the upper edge portion of the runners *a* whereby friction is relieved in the movements of the said runners in the propelling of the machine. Guide bars J located above and

extending parallel with the runners *a* extend through the cleft ends *f'* and are attached at their ends by standards *j* to the said runners.

The transverse shaft K journaled near its ends in suitable hangers depending from the side bars E is provided in its ends with cranks *k* which are connected by pitman *k'* to the runners whereby the latter receives a reciprocating movement. The cranks *k'* extend in diametrically opposite directions so as to actuate the runners *a* alternately. A short shaft L journaled in a bearing frame *f²* having cranks or pedals *l*, is provided with a sprocket wheel *l'* around which a sprocket chain *m* passes to transmit motion to the shaft K by means of a sprocket wheel *m'* on the said shaft K around which the sprocket chain also passes. By these means the runners *a* are alternately reciprocated to propel the sled.

To hold one runner in a relatively fixed position while the opposite runner is advancing dogs *g* are provided and pivotally connected with the said runner to automatically bite in the ice the instant the runner comes to a standstill to form a resistance while the opposite runner is advancing. These pivoted dogs *g* will be provided in sufficient number to obtain the desired result and are disposed to automatically disengage themselves from the ice and ride thereover with the runners when the latter is advancing, but which will drop into active position and bite into the ice the moment the progress of the latter ceases. As shown, two dogs are provided for each runner, one being pivoted to each of the standards *j*. It will be understood that the number is immaterial and will be increased or diminished as found desirable.

The steering mechanism consists of a shoe *h* approximating the form of a runner, an approximately vertical shaft *p* and a handle *n* within convenient reach of the seat I. The shaft *p* is mounted in a sleeve centrally disposed on the cross bar *e'* and is adapted to have both a rotary and longitudinal movement thereon. The steering is effected by turning the shaft *p* in the usual manner. The longitudinal movement of the shaft *p* in its bearing admits of the shoe *h* rising and falling to adapt itself to any inequality of the

surface of the ice and at all times remain in engagement therewith so as to have the machine under the control of the rider.

The rider perched on the seat I operates the crank *l* in the well known manner and through the gearing herein set forth alternately advances the runners which are retained in such position by the dogs *g* in the manner set forth.

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

1. In a sled, movable runners, mechanism for advancing the runners, and means for holding the said runners from retrograde movement, substantially as specified.

2. In a sled, movable runners, mechanism for alternately advancing the said runners, and means for holding the runners from retrograde movement during the interval that the moving runner is advancing, substantially as set forth.

3. In a sled, the combination with movable runners and mechanism for advancing the said runners, of pivoted dogs carried by the runners and adapted to bite in the ice to prevent retrograde movement and ride over the ice when the runner is advanced, substantially as set forth.

4. In a sled, the combination with movable runners, of a shaft having cranks extending in diametrically opposite directions and connected with the said runners to alternately operate the same, substantially as set forth.

5. In a sled the combination of movable

runners, the frame having rollers to travel on the said runners, and mechanism for alternately reciprocating the said runners, substantially as described for the purpose set forth.

6. In a sled, the combination with the movable runners having parallel guide bars, of the frame having rollers to operate in the space between the runners and guide bars, substantially as described for the purpose set forth.

7. In a sled the combination of the frame having forwardly extending guide rods *e*, movable runners having the said guide rods extending through the horns, and mechanism for reciprocating the said runners, substantially as set forth.

8. In a sled the combination of the frame bars *F* having their lower cleft ends provided with grooved rollers, runners having parallel guide bars *J* which extend through the said cleft ends, the grooved rollers operating in the space between the upper edge of the runners and the said guide bars, pivoted dogs carried by the said runners, and mechanism for alternately reciprocating the said runners, substantially as described for the purpose specified.

In testimony whereof I affix my signature in presence of two witnesses.

JOSEF HÖFER.

Witnesses:

EMIL CLARENBACH,
FELIX BENFEY.