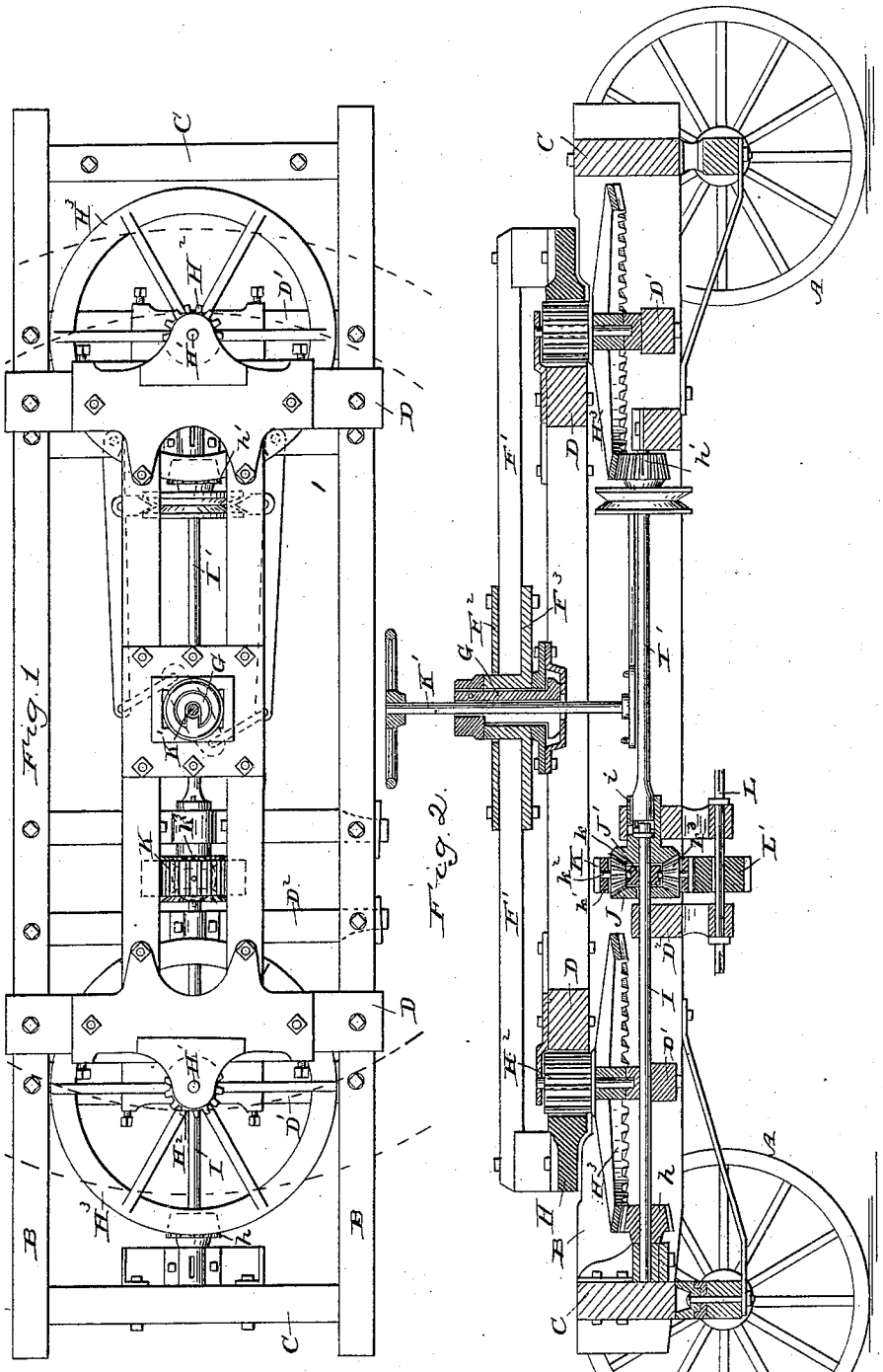
(No Model.) 3 Sheets—Sheet 1.

J. H. ELWARD.

HORSE POWER.

No. 287,259. Patented Oct. 23, 1883.



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Fig. 3

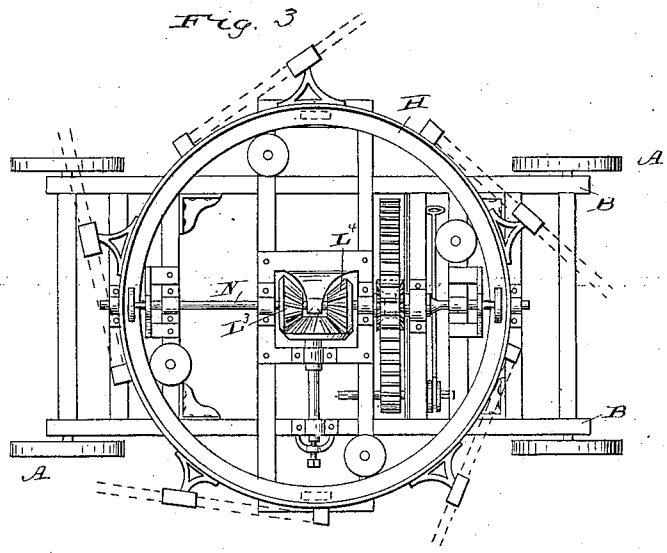


Fig. 4

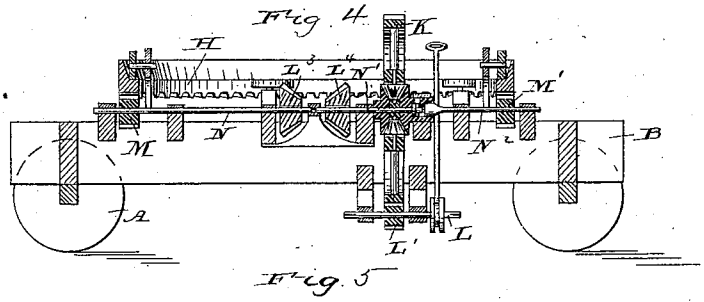
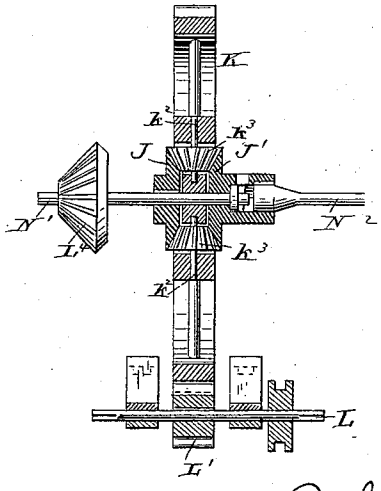


Fig. 5



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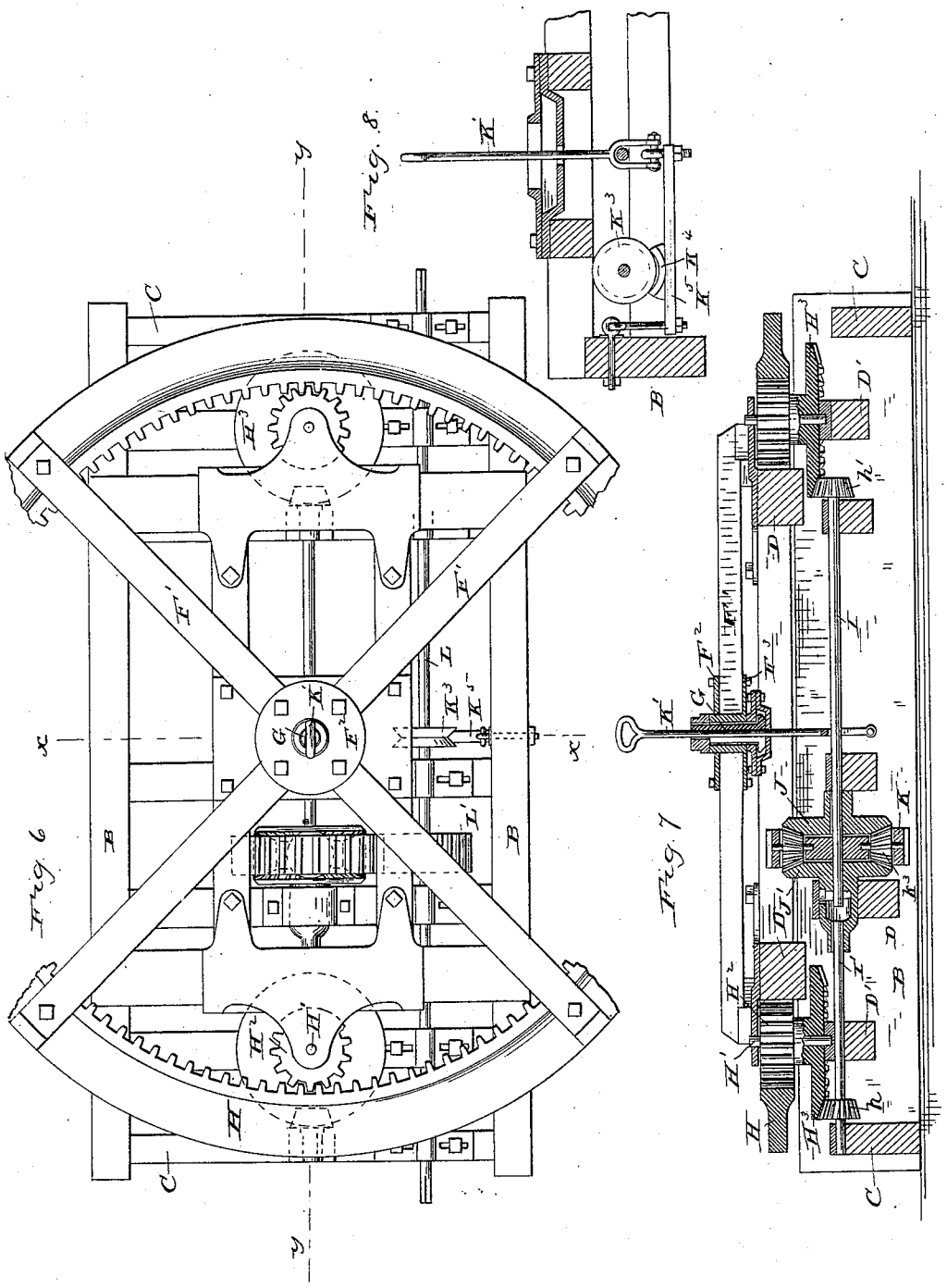
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(No Model.) 3 Sheets—Sheet 3.

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UNITED STATES PATENT OFFICE.

JOHN H. ELWARD, OF POLO, ILLINOIS, ASSIGNOR TO MARY ELWARD, OF SAME PLACE.

HORSE-POWER.

SPECIFICATION forming part of Letters Patent No. 287,259, dated October 23, 1883.

Application filed March 13, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. ELWARD, a citizen of the United States, residing at Polo, in the county of Ogle and State of Illinois, have invented certain new and useful Improvements in Horse-Powers, of which the following is a specification, reference being had therein to the accompanying drawings.

Figure 1 is a plan view of a horse-power embodying my improvements, it containing the general features of a horse-power of the class known as the "Pitts Powers." Fig. 2 is a central longitudinal section. Fig. 3 is a top plan view of another form of horse-power, also having my improvements applied thereto. Fig. 4 is a longitudinal section of the form shown in Fig. 3. Fig. 5 is a sectional detached view of the compensating-gear shown in Figs. 3 and 4. Fig. 6 is a top plan, Fig. 7 a longitudinal section, and Fig. 8 a partial cross-section, of another modified form.

In the drawings, A A are supporting and transporting wheels; B B, the longitudinal sills; C, end girts, and D D D' D² are the intermediate girts of the main frame, upon which the operating parts of the power are supported.

H is the master-wheel. In the construction shown in Figs. 1 and 2, said wheel is provided upon its inner face with cogs.

F' are radial arms secured at their inner ends to an upper plate, F², and a lower plate, F³, and at their outer ends attached to the master-wheel in such manner as to suspend it from an overhanging frame composed of said parts F' F² F³.

G represents the center-pin, which may be of any preferred character as to its construction and arrangement. In the machine shown it is represented as resting upon a plate secured to the frame, and is provided with a longitudinal passage for the brake-rod K', which is connected with brake-levers arranged to operate upon a friction-wheel suitably situated for stopping the momentum of the machine when necessary.

H' H' represent the vertical shafts, upon which are mounted the master-pinions H², the latter being arranged to mesh with the teeth on the inner side of the master-wheel. With each of these pinions is formed, or to it is attached, a bevel-wheel, H³. One of the wheels H³ meshes with a bevel-pinion, *h*, and the other with a bevel-pinion, *h'*. These pinions are mounted on substantially the same axial line, they being respectively keyed to the parts I I' of a two-part line-shaft.

The part I of the shaft is mounted in bearings on the sill C and D², and the part I' is mounted at the other end of the machine.

J represents a bevel-wheel keyed to the part I of the line-shaft, and J' represents a bevel-wheel of substantially the same character keyed to the part I'. The part I of the shaft projects through the engaging portion of the wheel J' into a hollow hub thereof, into which hub it is fitted with a pin or nut, which prevents longitudinal movement of either the said part I or the wheel J' relatively to each other. The part I' of the shaft is keyed in said hollow hub, the latter being represented by *i*.

K represents a spur-wheel arranged around the line-shaft between the bevel-wheels J and J'. It is provided with the hub portion *k* and a peripheral part, *k'*. Between the hub and the peripheral part there are arranged two or more radial shafts, *k²*, upon each of which there is mounted a pinion, *k³*. These pinions are each adapted to engage with both of the wheels J and J'. Below or at one side at the wheel K is arranged the tumbling-rod shaft L, upon which is the pinion L', which engages with the said wheel K.

When the machine is in operation, the master-wheel in its rotation rotates the master-pinions H² H², which, through the bevels H³, drive the pinions *h h'* in the same direction. It is well known to those practically acquainted with the operation of machines of this class that much trouble is experienced from the fact that more power is often imparted to one of the pinions *h h'* than the other, and, as a result, there is a great straining of the parts of the machine and frequent breakages. This I avoid entirely by transmitting the power from the wheel to a shaft of the character I have shown, and from said shaft to the tumbling-rod shaft by my improved construction and arrangement of parts. If more power should be applied to the pinion *h* than to the pinion *h'*, there will be no disastrous straining experienced by the line-shaft, and the power will be uniformly and evenly distributed to

the tumbling-rod shaft, and the same will result if the pinion h' should be receiving more power than the pinion h.

I do not wish to be limited to the exact form of devices which I have shown for holding the master-wheel properly in central position, as others can be readily substituted without departing from the spirit of my invention.

In Figs. 3, 4, and 5 I have shown a horse-power of a modified form, to illustrate the fact that some of the features of my invention can be readily applied thereto also. In this case the master-wheel has the cogs upon its under side, which mesh with pinions M M', keyed to the radial shafts N and N' N^2. The outer ends of said shafts are supported in suitable bearings attached to the cross-girts. At the inner ends said shafts N and N' N^2 are provided with pinions L^3 and L^4. These pinions are connected by gearing of any suitable character. The power is transmitted from the shafts N and N' N^2 through the wheel K to the power-shaft L by means of a pinion, L', these last said parts being of substantially the same character as those shown in the other construction.

The pinion L' and the shaft L are mounted in a stirrup frame or bracket depending from the under side of the frame, and this can be adjusted in or out, so that a larger or smaller pinion can be substituted for that at L' to vary the speed of the tumbling-rod shaft.

The master-wheel is held properly in position laterally and vertically by means of guiding anti-friction wheels or rollers, some in horizontal planes and some in vertical planes, which wheels or rollers may be of any preferred style as to their construction and mounting. These wheels in this construction perform many of the functions performed by the center-pin and the other holding devices at the center of the wheel in the construction shown in Figs. 1 and 2.

The shaft N' N^2 is made in two parts, loosely connected together in a manner substantially similar to that shown and described for connecting together the line-shaft in the other construction. The wheel K has combined with it bevel-wheels J J' and pinions k^3, which operate in conjunction with the shaft N' N^2 in substantially the same manner that the corresponding parts operate in the other construction. Here, too, it will be seen that if the master-wheel should be applying greater power to one of the radial shafts than to the other, the mechanism last above described will insure that there shall be no straining or twisting of any of the transmitting devices, but that power shall be carried smoothly and evenly to the power-pinion L'. When the same amount of power is being applied to each of the master-pinions, in this case (as in the other) the bevel-wheels J J' will rotate together; or, if there should be a tendency for either of said master-pinions to go more slowly than the other, its corresponding bevel-wheel, J or J', can be retarded without any serious results.

Another slightly-modified form of horse-power is shown in Figs. 6, 7, and 8, having my improvement combined therewith. In this case the master-wheel, frame, master-pinions, line-shaft, and compensating-gear are substantially the same as those shown in Figs. 1 and 2, except that they are shown as being firmly supported upon the ground instead of being mounted upon the transporting-wheels. However, in this case I have shown a modified method of mounting and operating the tumbling-rod shaft, and of applying a brake to the machine. The tumbling-rod shaft is mounted by the side of the line-shaft in Fig. 3—that is to say, in or nearly in the same horizontal plane—it projecting beyond the ends of the frame, and having several points of bearing in said frame. The brake-wheel K^3 is attached to the tumbling-rod shaft instead of the line-shaft, as is ordinarily the custom. I find it advantageous to attach it to the tumbling-rod shaft, as when a compensating-gear is employed upon the line-shaft the brake interferes more or less with said compensating-gear. The brake-wheel is shown as being of the ordinary kind—that is to say, provided with a groove in its periphery, with which groove can engage a brake-block, K^4, carried by a vibratable lever, K^5, which can be drawn up by a sliding lever, K'.

I am aware that brakes of this kind have been used in various ways on a line-shaft, and do not claim, broadly, such brake as my invention; but I am not aware of the fact that it has been combined, in the advantageous manner which I have herein shown, with a compensating-gear, the brake being applied to the tumbling-rod while the compensating-gear is situated upon the line-shaft.

What I claim is—

1. In a horse-power of the kind hereinbefore described, the combination of the compensating-gear having cogged teeth on its outer periphery and situated on a horizontally-arranged line-shaft, the tumbling-rod shaft and a gear-wheel on said tumbling-rod shaft meshing directly with and driven by the teeth on the periphery of said compensating-gear wheel, substantially as set forth.

2. In a horse-power of the character described, a master-wheel, two master-pinions driven by the master-wheel, two crown or bevel wheels carried by the master-pinions, two bevel-pinions driven by the bevel-wheels, a compensating-gear driven by the bevel-wheels, and the tumbling-rod shaft driven by the compensating-gear, substantially as set forth.

3. The combination of the master-wheel, the line-shaft driven thereby and made in two independently-movable parts, a compensating-gear on said two-part line-shaft, and means for holding the master-wheel in proper position relative to the compensating-gear and relative to the two-part shaft, substantially as set forth.

4. The combination of the master-wheel, the

line-shaft driven thereby and made in two independently-movable parts, a compensating-gear on said two-part line-shaft, arms rigid with the master-wheel and running to the center thereof, and means at the center of the wheel engaging with said arms for holding the wheel properly centrally relatively to the compensating-gear and to the two-part line-shaft, substantially as set forth.

5. In a horse-power, the combination, with the line-shaft, the tumbling-rod shaft, and the compensating-gear, of adjustable bearings for the tumbling-rod shaft, to move it nearer to or farther from the line-shaft, substantially as set forth.

6. In a horse-power, the combination of the master-wheel, the line-shaft, the compensating-gear carried by said shaft, and the brake mechanism secured to a shaft other than the line-shaft, substantially as set forth.

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

JOHN H. ELWARD.

Witnesses:

D. F. MACPHERSON,

JNO. P. MARTIN.