

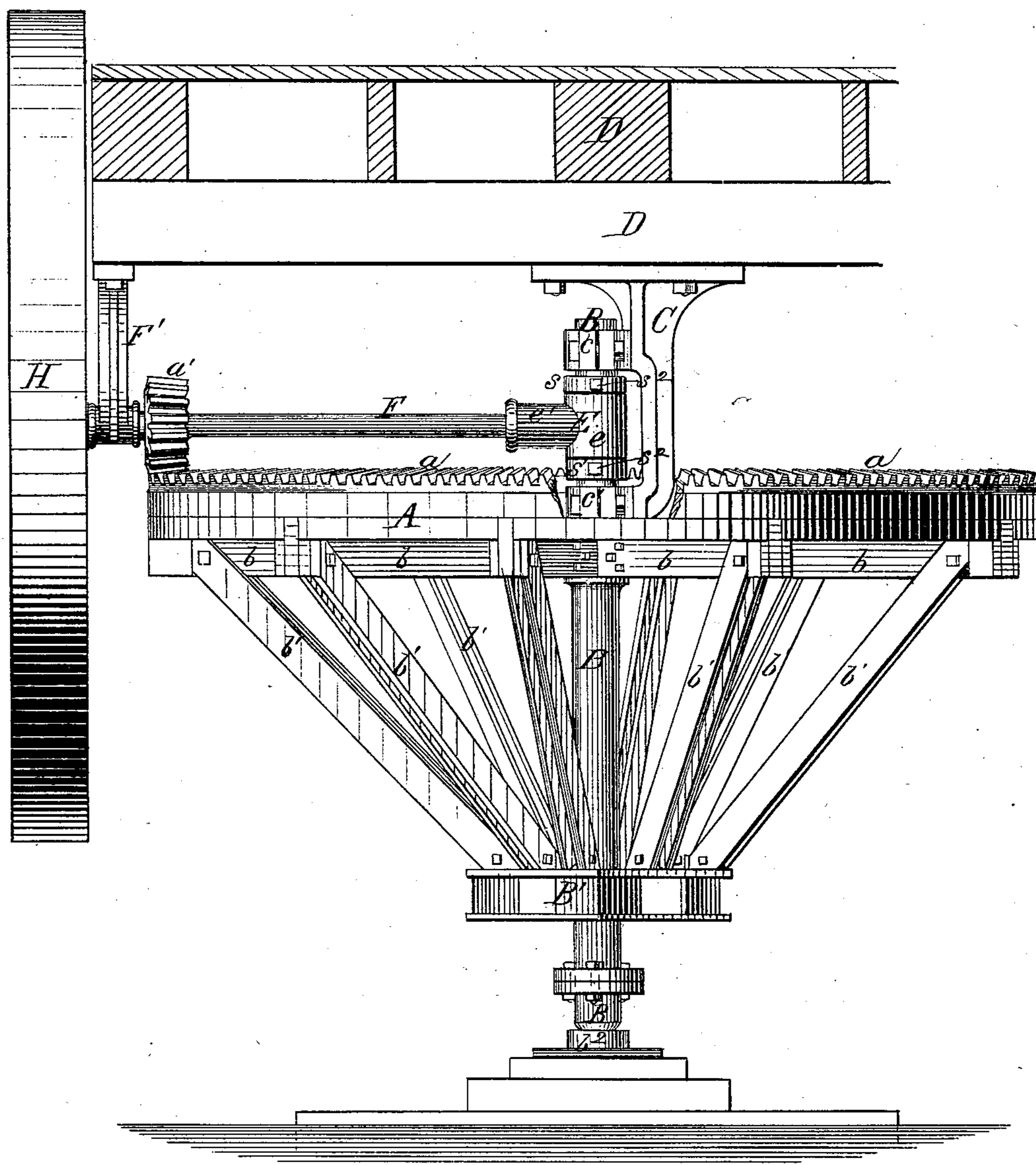
(No Model.)

W. DEERING.

HORSE POWER.

No. 254,624.

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UNITED STATES PATENT OFFICE.

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HORSE-POWER.

SPECIFICATION forming part of Letters Patent No. 254,624, dated March 7, 1882.

Application filed December 19, 1881. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM DEERING, of Louisville, county of Jefferson, State of Kentucky, have invented or discovered a new and useful Improvement in Horse-Powers; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawing, making a part of this specification, which is a view in elevation of a horse-power illustrative of my invention.

My present invention relates chiefly to that class of horse-powers which are used in barns and gin-houses, and which require the use of some part of the frame-work of such building as a means of attachment for operative purposes. Such horse-powers, designed to be driven by horses, mules, or oxen, are made with a vertical shaft carrying a horizontal master-wheel, from which, through bevel-pinions, counter-shaft, pulley, and belts, power is transmitted to the machinery which does the work.

It is a well-understood rule in the putting up of ordinary bevel-gear that the lines of the cogs, both of driver and driven, should be in the planes passing longitudinally through their respective axes of motion, and that such planes at the middle point of the bite or mesh of the cog-wheels should coincide throughout, and in such case the axial lines of the shafts, if continued, will intersect each other.

Usually in the putting up of bevel-gearing in manufacturing-establishments, machine-shops, &c., the setting of the axle-shafts is done by skilled machinists, who understand and in practice are governed by this principle; but for barn and gin-house work skilled labor is seldom available. The work is usually done by farmers or ordinary carpenters, who have not the necessary skill for always setting the shaft carrying the bevel-pinion exactly or with precision in the radial plane of the shaft of the main drive or master wheel, so that the bevel-wheels may run in practice as they are designed in principle. Hence it too frequently occurs that such shafts are put up out of the proper alignment; and even if the first alignment be correct it often happens that the springing or yielding of the barn or gin-house timbers, under heavy strains or from other causes,

throws the shafts more or less out of correct alignment, so as to give rise to undue loss by friction or waste of driving-power, or to the necessary use of more power than ought to be required. My invention is designed to obviate these difficulties by making such provision, as hereinafter described, for mounting the counter-shaft that it may adjust itself to the proper line or direction toward the axis of the master-wheel, both on its original setting and also in case it afterward be moved or displaced. By this means I dispense with the necessity of employing skilled mechanics to set up such horse-powers for use, as such work can be done by common laborers, the necessity for nice adjustment being removed or otherwise provided for.

In the drawing, A represents a master-wheel carrying on its upper face a bevel-gear, *a*. This master-wheel, according to its size for different purposes, may be of all iron or of wood segments on radial arms supported by braces, as desired. In this case it is supported by a vertical central shaft, B, radial arms *b*, and braces *b'*, the latter resting on their lower ends on the lever-box B', to which the levers are to be bolted for the attachment of the horses. The foot of shaft B rests in a step, *b*², which may be supported on any desired form of foundation. The upper end of this shaft is journaled in one or more boxes, *c c'*, secured to the central hanger, C. I have shown two of these boxes, *c* and *c'*, separated somewhat, and between them is fitted a swivel journal-block, E, consisting of a tubular hub, *e*, and a journal socket-projection, *e'*. The hub *e* is bored to fit closely enough on the shaft B to support the socket *e'* horizontally, and yet to allow a motion on the shaft in a rotary direction. Vertical movement of the swivel on the shaft is prevented by collars *s s'* above and below, which are bound to the shaft by set-screws *s*². The height of the swivel can thus be adjusted between the boxes *c c'*, as desired.

In the socket *e'*, which is carefully bored at right angles to the hub *e*, is journaled the inner end of counter-shaft F, on which is the bevel pinion *a'*, with its cog working into the cogs *a* of the master-wheel A. The outer end of this counter shaft is supported by hanger

F', and outside of this hanger is the pulley H for conveying the power to the thrashing-machine, cotton-gin, or home corn-mill.

Heretofore a nice knowledge of the principle involved and great care had to be exercised in setting the central hanger, C, and the outside hanger, F, so as to secure the pinion-shaft F in the right alignment with the master-wheel shaft B; but with the mounting herein shown no such nice knowledge or care are necessary. Heretofore if the hanger F' were put up a hair's breadth to the right or to the left of a due position, or if, with the machine in operation, it were moved to the right or to the left of that position, the cogs of both wheel and pinion ground abnormally against each other, and the consequences were harder work on the horses, a premature wearing of the pinion, and an irritation toward and dissatisfaction with the manufacturer. With this improvement the outside hanger may be put up to the right or to the left, or under any pulling of the belt may move to the right or to the left, and, as in either of these cases the journal-socket *e'* will of itself veer round in the measure exactly proportionate, it follows that the cogs of the pinion will always converge without deviation exactly toward the point necessary to secure their proposed and perfect operation.

With the improvement herein shown and described it is now, therefore, a matter of indifference, so far as the proper working of the gear is concerned, how hanger C be set, or whether hanger F' be moved horizontally or not, since at whatever point in the circumference hanger F' be placed, or if it be moved from its original position, the swiveled journal-block E will turn on shaft B, so as to bring its socket *e'* in proper line, and thus keep the inner end of the counter-shaft pointing toward the axial line of the master-wheel shaft. Consequently in setting up my improved horse-power the position of hanger C may be determined solely with reference to keeping the main shaft B in proper vertical position, and the hanger F' may be located at any point with reference to the desired position of pulley H, for in so doing the swivel E will accommodate itself to any such position independent of hanger C. In this way the counter-shaft may without difficulty

be set and maintained in proper line, and the gears *a a'* be made to mesh evenly and properly.

If preferred, a single box may afford bearing for the shaft B, which box may be placed either above or below the collars *s s'*, and be attached to the central hanger, substantially as either the box *c* or *c'*.

By using collars *ss'* separate from the boxes *c c'*, with free space between the collars and boxes, as shown, the vertical position of swivel E on shaft B may be determined or adjusted independent of the hanger and its box; also, the counter-shaft will not be effected by vertical movement of hanger C, due to shifting of timber D by settling or springing under or when relieved from a load. For these and similar reasons I prefer to secure the swivel E substantially as represented, though in cases not subject to the changes mentioned the collars *s s'* may be omitted, and the boxes *c c'* be employed to prevent vertical movement of the swivel by making the hub part *e* of proper length to fill the space on the shaft between such boxes.

The vertical shaft B may be solid, as shown, and as commonly employed in the cheaper class of horse-powers; or it may be tubular, inclosing a central cylindrical post, around which the shaft or sleeve will revolve.

The application and purpose of the swivel or journal block E will be substantially the same in either case.

I claim herein as my invention—

In a stationary horse-power, the combination of vertical shaft B, master-wheel A, counter-shaft F, geared with the master-wheel, swiveled journal-block E, having free pivot-connection with shaft A, central hanger, C, for supporting the upper end of such shaft, and adjustable bearings *s s'* on this shaft above and below the journal-block, substantially as described, whereby provision is made for separate adjustment of the journal-block and central hanger.

In testimony whereof I have hereunto set my hand.

WILLIAM DEERING.

Witnesses:

MARY C. REXTER,
WILLIAM LUTZ.