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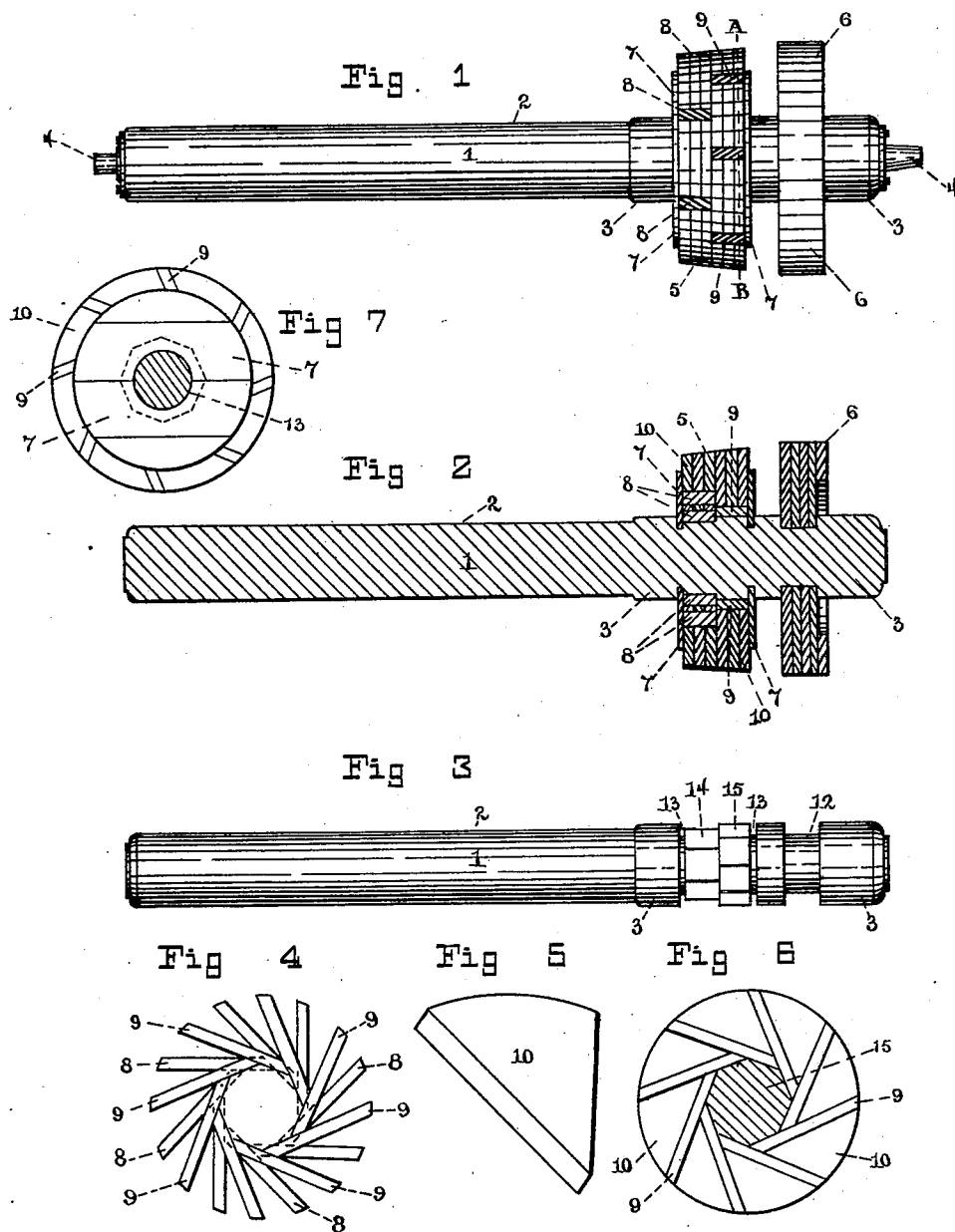
Patented Aug. 13, 1901.

H. W. EATON, JR. & A. BENSON.
SAND REEL FOR OIL OR ARTESIAN WELLS.

(Application filed Mar. 4, 1898.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES;

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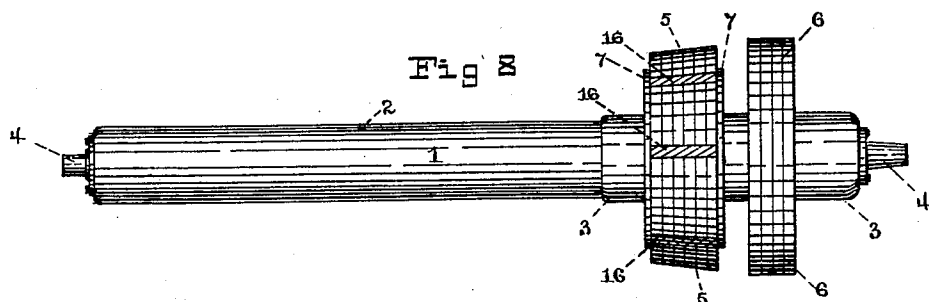
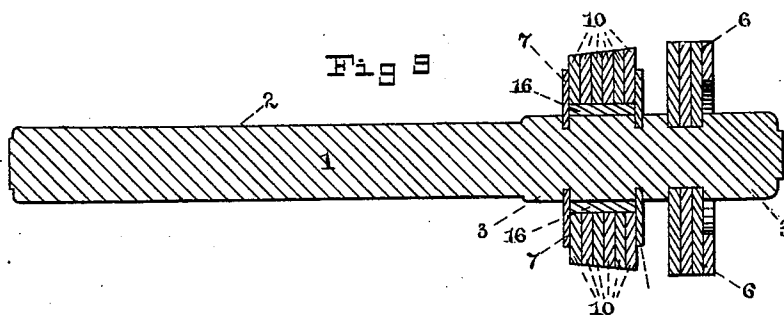
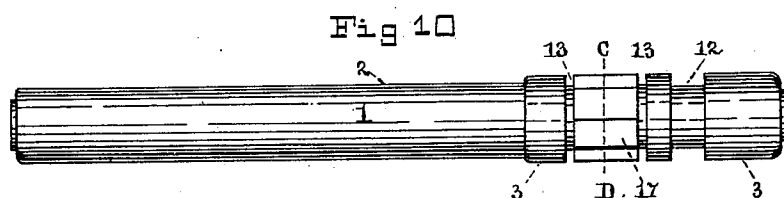
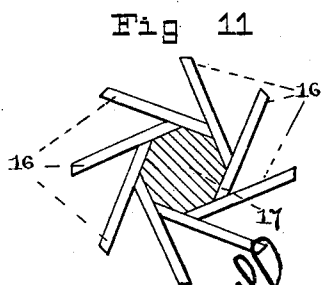
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2 Sheets—Sheet 2.

(No Model.)



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UNITED STATES PATENT OFFICE.

HIRAM W. EATON, JR., AND ANDREW BENSON, OF BRADFORD,
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SAND-REEL FOR OIL OR ARTESIAN WELLS.

SPECIFICATION forming part of Letters Patent No. 680,234, dated August 13, 1901.

Application filed March 4, 1898. Serial No. 672,502. (No model.)

To all whom it may concern:

Be it known that we, HIRAM W. EATON, JR., and ANDREW BENSON, citizens of the United States, residing at Bradford, in the county of McKean and State of Pennsylvania, have invented a new and useful Improvement in Sand-Reels for Oil or Artesian Wells, of which the following is a specification.

Our invention relates to the art of well-drilling, and has particular reference to improvements in sand-reels commonly employed in the operation of sinking oil, Artesian, or other deep wells. These reels usually occupy a position upon the mud-sills between the source of power and mouth of the well and have spooled upon them the customary operating or sand line, through the agency whereof a sand pump or bailer is actuated at frequent intervals. As understood by those skilled in the art, a sand-reel is equipped with suitable driving and brake wheels, one for the purpose of contacting at times with a friction-wheel of larger dimensions, known as a "band-wheel," receiving rotary motion from a main source of power, and the other for engaging or being engaged by a suitable brake-shoe band or lever to retard its rotation. In the operation of sinking a deep well it is necessary to rid the same of drillings and sediment at frequent intervals, and in the case of oil-wells, for example, often measuring several thousand feet in depth, the time consumed in elevating a sand-pump or bailer and in returning same to the bottom or point of drilling is a matter of much importance. To accomplish this circuit on the part of a bailer with the least possible expenditure of time is an important duty imposed upon reels of the class to which this relates, and in the performance of such duty the sand-line is rapidly coiled, while the reel is held in frictional contact with the band-wheel and even more rapidly uncoiled when shifted from contact therewith, a suitable brake being applied during the latter action to forbid a too-rapid return of the bailer.

The foregoing being the general purposes of our invention, it may be said to consist es-

pecially in the construction of the sand-reel hereinafter described—the construction of a reel fully capable of withstanding the great strains and wear to which it is constantly subjected and one which is peculiarly efficient in the performance of its ascribed functions. To this extent the present application for Letters Patent is related to others of a series filed simultaneously herewith on the 4th day of March, 1898, and serially numbered, respectively, 672,503, 672,504, 672,505.

The invention will be hereinafter described, and particularly pointed out in the claims following.

In the accompanying drawings, which form part of this specification, and whereon corresponding numerals indicate the same parts in the several views, Figure 1 represents in side elevation our improved form of sand-reel detached, showing the reel shaft or drum, a frictional driving-wheel, and a frictional brake-wheel. Fig. 2 is a central longitudinal section through all parts appearing in Fig. 1. Fig. 3 is a side elevation of the reel shaft or drum stripped of all detachable parts. Fig. 4 is a structural end view of the driving-wheel in the course of construction, showing a double series of tangential arms or blades upon which said wheel is built. Fig. 5 is a perspective view of one detached sector-block, such as employed between the projecting ends of the tangential arms aforesaid. Fig. 6 is a transverse cross-section taken on the line A B, Fig. 1 and illustrating the location and use of sector-block shown by Fig. 5. Fig. 7 represents a side view of the frictional driving-wheel, including one of two sectional retaining flanges or collars flanking said wheel and forming part thereof. Fig. 8 represents in side elevation a modified form of the invention. Fig. 9 is a central longitudinal section of modification illustrated by Fig. 8. Fig. 10 is a detached side elevation of the reel-shaft indicated in Figs. 8 and 9. Fig. 11 is a transverse sectional view of the same modified construction taken on the line C D, Fig. 10.

Reference being had to the drawings and numerals thereon, 1 indicates the reel shaft

or drum, usually of hard wood and finished at its ends with gudgeons 4 4, by means of which it is journaled to rotate in its supporting-frame. (Not shown.) Upon shaft or drum 1 the sand-line is spooled, as usual, and in practice the outer end or head of said drum is slightly enlarged, as at 3. The enlargement 3 of shaft 1 is configured at 14 and 15 by polygonal depressions, which in the present illustrations are octagonal in form, the apices of each figure being staggered or alternating with relation to those of the other figure, as shown. Upon each side depressions 14 15 are flanked by circular grooves 13, and beyond is an additional transverse indentation 12, all for purposes which will now appear.

Upon the faces of octagons 14 and 15 are rigidly secured tangential arms 8 and 9, respectively, between which are fitted and firmly attached a double series of sector-blocks 10, which owing to the arrangement of arms 8 9 overlap or break joints for purposes of rigidity. Said construction and arrangement of arms and sectors also facilitates the through and cross nailing or bolting, whereby or by other suitable means the parts are effectively secured. These blocks 10 are preferably of hard wood and so cut that the grain of each extends from the apex to the curved outer edge, thus forming a circular laminated driving-wheel the grain whereof radiates uniformly from its center to circumference. Within grooves 13 13 on each side of said head are secured sectional retaining flanges or collars 7, being divided at least upon a median line to facilitate attachment to the shaft 1, which they surround and inclose. The indentation 12, also in enlargement 3, is designed to receive a frictional brake-wheel 6, which, as best shown by Fig. 2, is also of laminated construction, being by preference made up of wooden (hemlock) flanges divided to permit of attachment in cross-grain relative arrangement and bonded together in any approved manner.

The modification illustrated by Figs. 8, 9, 10, and 11 differs from the construction heretofore described only in the substitution of a single polygonal depression for reception of the friction-head 5 in place of a double one and in the consequent absence of one set of tangential arms, to which the sector-blocks 10 are attached, the use and operation of the invention in any event being as follows: It being necessary to spool the sand-line upon shaft or drum 1 for the purpose of elevating a bailer or sand-pump dependent therefrom, driving-wheel 5 is moved into frictional engagement with the customary band-wheel, (not shown,) whereupon the entire reel is rapidly revolved with the desired effect. During this coiling or lifting operation the wheel 5 is necessarily subjected to very severe strains, especially when operating upon wells of great depth, so

much so that the life of such wheels has heretofore been of brief duration. In the present construction, however, durability and uniformity of wear have been combined and increased to a marked degree, more especially by reason of the salient features of construction hereinbefore noted—to wit, the tangential arms and inserted sector-blocks—the general efficiency of the apparatus being thereby correspondingly improved. Not only is this true of the reel, but likewise of the band-wheel and all coacting parts, inasmuch as a “flat” in the friction-head is rendered impossible with ordinary usage, owing to the radial arrangement of the grain of wood from which sectors 10 are made. A bailer having been lifted thus and relieved of its load, the return or uncoiling operation next takes place. Wheel 5 being withdrawn from contact with the band-wheel, the sand-line may then run back into the well at a rapid pace, a dangerously rapid movement being prevented, however, through the agency of brake-wheel 6, now engaged by a suitable brake shoe, band, or lever of any approved pattern, (not shown,) which under control of an operator may be applied with more or less pressure, as occasion requires.

This being a general description of our invention in its preferred form of construction, we claim and desire to secure by Letters Patent—

1. In a reel for oil and Artesian wells, the combination with a shaft having a polygonal head, of a series of tangential arms secured to said head, and a series of sector-blocks which fill the spaces between and are supported by the tangential arms, substantially as and for the purposes specified.

2. In a reel for oil and Artesian wells, the combination with a shaft provided with a plurality of adjacent polygonal heads whose apices break joint, of a plural series of tangential arms, and corresponding series of overlapping sector-blocks interposed between the tangential arms of the respective series, substantially as and for the purposes specified.

3. In a reel for oil and Artesian wells, the combination with a shaft provided with a plurality of adjacent polygonal heads, of a plural series of tangential arms, and corresponding series of overlapping sector-blocks interposed between and supported by said arms thus comprising a laminated driving-wheel, substantially as and for the purposes specified.

4. In a reel for oil and Artesian wells, the combination with a shaft provided with a plurality of adjacent polygonal heads, of a plural series of tangential arms, and corresponding series of overlapping sector-blocks interposed between and supported by said arms thus comprising a straight-grain laminated driving-wheel, substantially as and for the purposes specified.

5. In a reel for oil and Artesian wells, the

combination with a spooling-drum having an enlarged head, of polygonal depressions surrounding said head in alternate arrangement forming a double hub, of arms tangentially
5 projected from each of said depressions, overlapping sector-blocks tangentially supported by said arms, and a brake-wheel also mounted upon the head composed of laminated overlapping flanges, substantially as and for the purposes specified.

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Witnesses:

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