(No Model.) 3 Sheets—Sheet 1.

G. W. KING.

BRACE FOR DREDGING OR EXCAVATING MACHINES.

No. 540,744. Patented June 11, 1895.

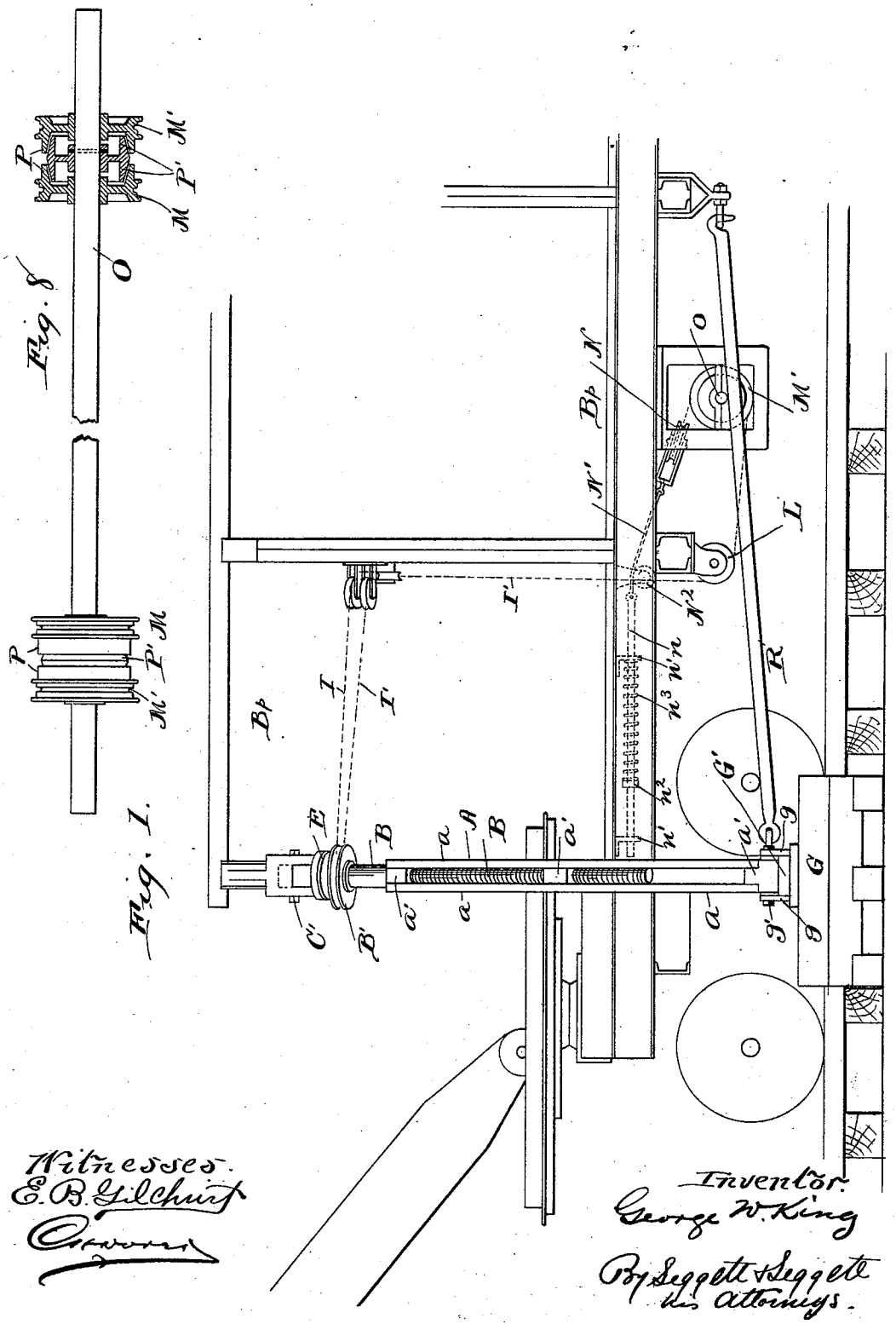

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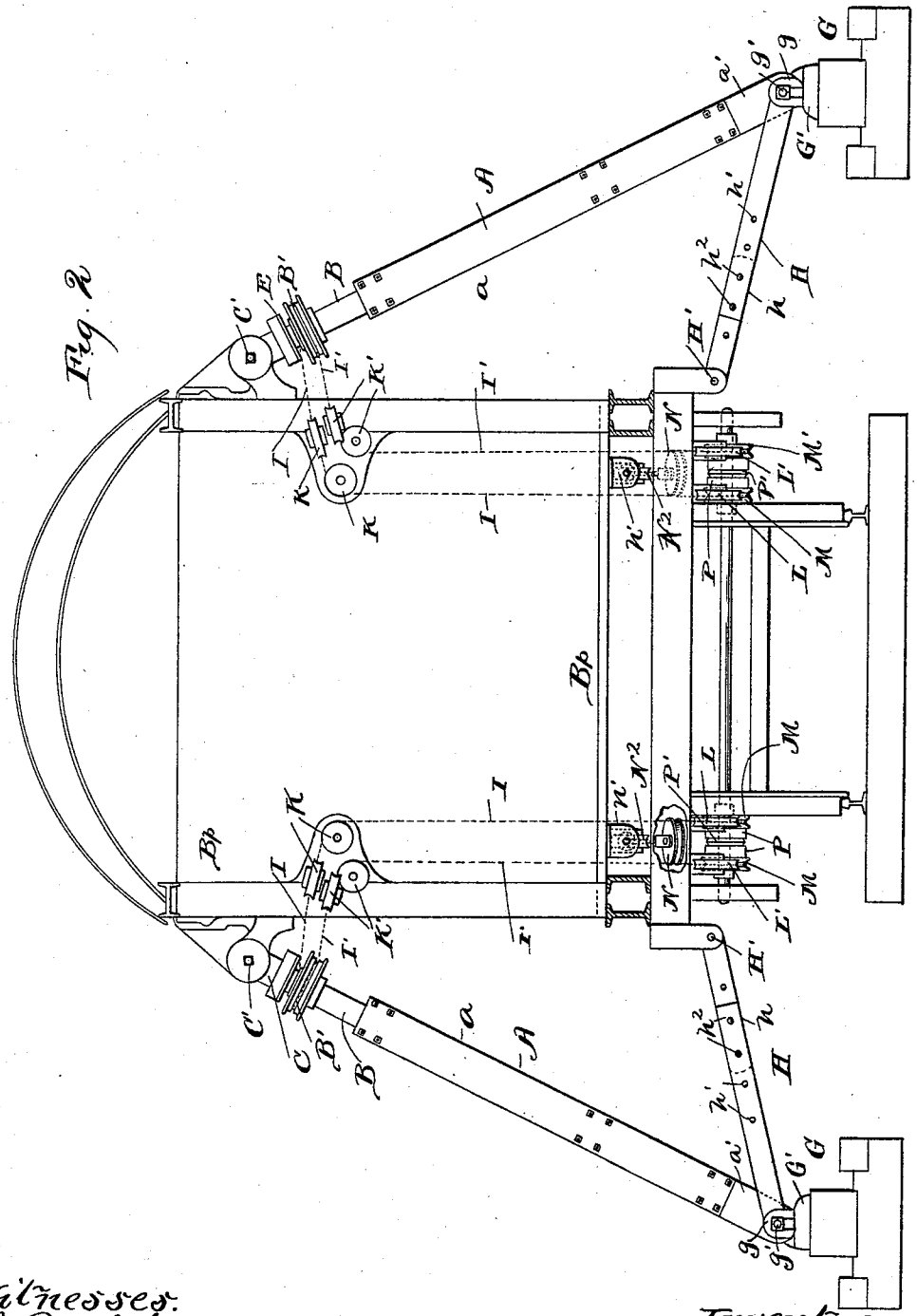
Fig. 2.



Witnesses:
E. B. Gilchrist
Crowell

Inventor:
George W. King
By Seggett & Seggett
his Attorneys

(No Model.) 3 Sheets—Sheet 3.

G. W. KING.

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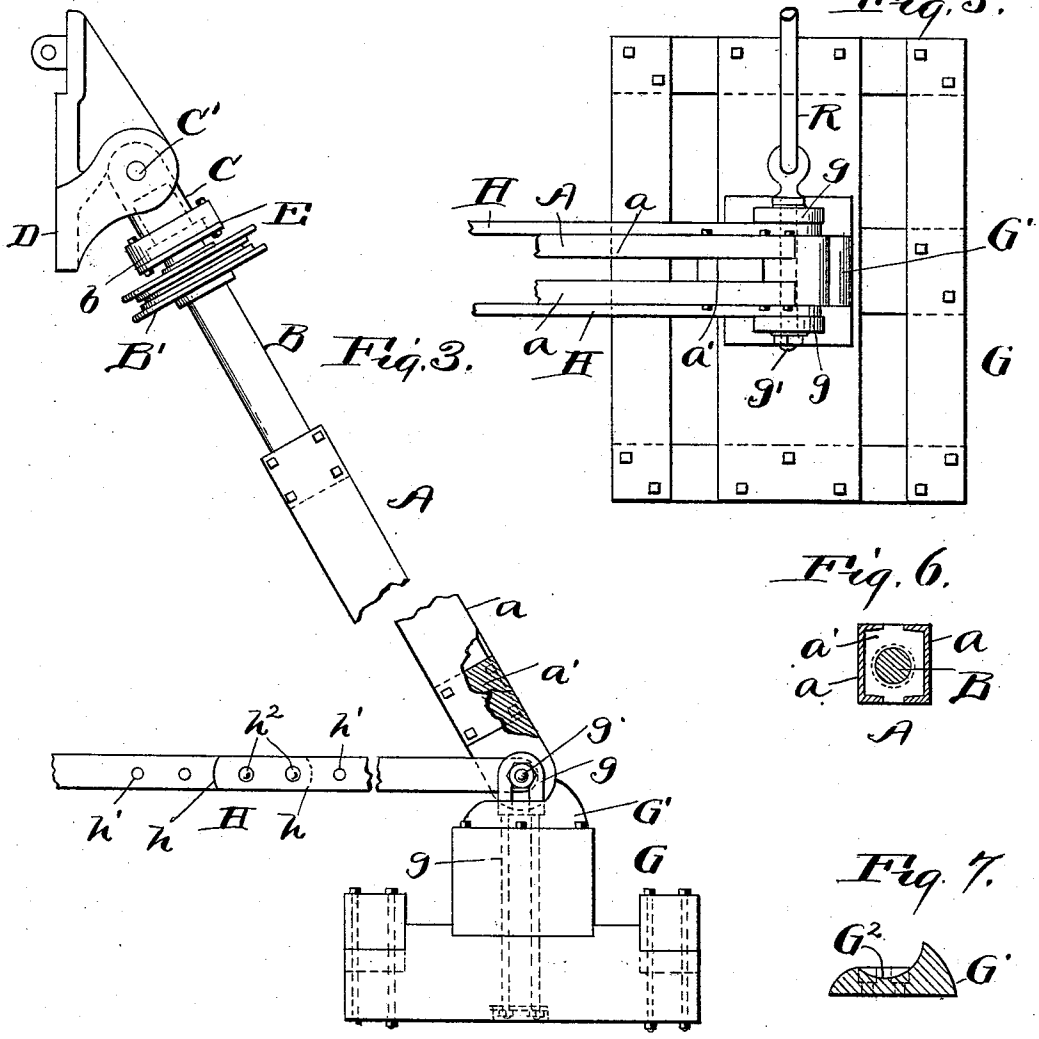

Fig. 3.

Fig. 5.

Fig. 6.

Fig. 7.

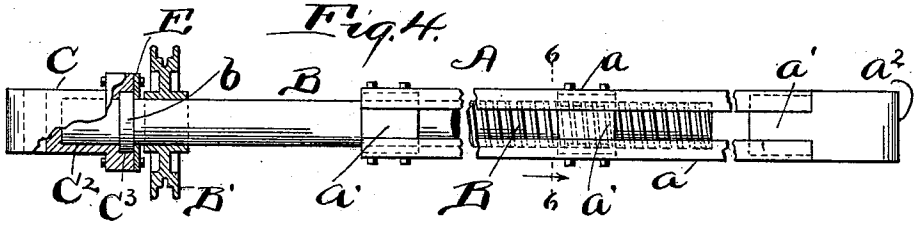

Fig. 4.

Witnesses.
E. B. Gilchrist
Edwards

Inventor.
George W. King.
By Leggett & Leggett
his attorneys.

UNITED STATES PATENT OFFICE.

GEORGE W. KING, OF MARION, OHIO.

BRACE FOR DREDGING OR EXCAVATING MACHINES.

SPECIFICATION forming part of Letters Patent No. 540,744, dated June 11, 1895.

Application filed April 28, 1894. Serial No. 509,292. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. KING, of Marion, in the county of Marion and State of Ohio, have invented certain new and useful Improvements in Braces for Dredging or Excavating Machines; 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 pertains to make and use the same.

My invention relates to improvements in steam-shovels, dredges or excavators, more especially to a power-jack or bracing-apparatus for machines of the variety indicated, the primary object of my invention being to provide means whereby the jack or bracing apparatus can be operated by power; to enable the operator to set the jack or bracing apparatus tight, or loosen it at pleasure, and to dispense with the necessity of hand labor for this purpose.

With this object in view, and to the end of producing a construction that possesses durability, simplicity, convenience and efficiency, my invention consists in certain features of construction, and in combinations of parts hereinafter described and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a portion of an excavator embodying my invention. Fig. 2 is an end elevation of a portion of the excavator provided with a pair of my improved power-jacks or bracing devices. Portions are broken away and in section in said figures to more clearly show the construction and to reduce the size of the figures. Fig. 3 is an enlarged side elevation of the brace proper, portions being broken away to reduce the size of the figure. Fig. 4 is an elevation of members A, B, and C, with portions broken away and portions in section. Fig. 5 is a top plan of platform or member G and adjacent portions of the connected parts. Fig. 6 is a transverse section on line 6 6, Fig. 4. Fig. 7 is a transverse section of plate G'. Fig. 8 is an enlarged side elevation, partly in section, of portions of the reversing-gear employed.

Referring to the drawings, B represents the frame-work or body-portion of the excavator.

Two power-jacks or bracing apparatus are provided, the same being located at opposite sides of the excavator, respectively. Both jacks or bracing apparatus and the mechanism for operating the means employed to lengthen or shorten the brace-proper of each bracing apparatus are alike in construction and a description and complete illustration of one will answer for both.

My invention not only consists in an improved construction of jack or bracing apparatus for the purpose indicated, but also in means for lengthening and shortening the brace-proper of the jack and in the means employed for operating said brace-lengthening and shortening-means.

My improved apparatus comprises a diagonally arranged brace composed of two sections A and B adjustable endwise to lengthen or shorten the brace. The lower section A is composed preferably of two channel-bars *a* arranged a suitable interval apart and parallel with each other, with the flanges of each bar presenting toward the flanges of the other bar as shown in Fig. 6, and with the bars held apart by means of blocks *a'*, to which the channel-bars are bolted or secured. In the case illustrated three blocks *a'* are shown thus interposed between the channel-bars *a a*, two at opposite ends of the bars, respectively, and one at the central portion of the bars.

The upper section B of the brace consists preferably of a screw that extends easily through a hole in block *a'* at the upper end of lower section A and engages a correspondingly-threaded hole in the block *a'* that is located at the central portion of said section A (see Fig. 4), said centrally-located block *a'* constituting a nut. The upper portion of screw B is plain or unthreaded and, at its upper end, has bearing in socket C that is pivotally secured, as at C', to a casting or bracket D rigid with the upper portion of the respective side of the frame-work or body-portion of the excavator. The bore C^2 of socket C is enlarged at its end, as at C^3, (see Fig. 4) and said enlarged portion of hole C^2 is engaged by a collar, *b*, on screw B, which collar, in conjunction with a plate E secured to the lower end of the socket and engaging the lower end of the collar, holds the screw from dropping out of the socket.

A platform G is suitably connected with the

lower end of the lower section A of the brace, preferably by a pivotal connection consisting of a pair of staples g secured to the platform and embracing a pin g' extending through the block a' at the lower end of section A, (see Figs. 3 and 5) said block extending below channel-bars a for the purpose and being preferably rounded at its lower end, as at a^2, with said rounded end engaging a corresponding recess or depression G^2 in a plate G' suitably secured to platform G. (See also Fig. 7.)

H, (see Fig. 2) designates a bar or connection between the lower end of brace A B and the lower part of the frame-work or body-portion of the excavator, said bar being pivoted, at one end, to the lower end of the lower section A of the brace preferably by means of pin g', and, at its other end, being pivotally secured, as at H', to the body-portion or frame-work of the excavator. Member H is adjustable in length, being shown composed of two sections overlapping each other at h and adapted to be adjusted endwise the one upon the other, said sections being provided with a series of holes h', respectively, arranged so that the holes in the one section are adapted to register with the holes in the other section, and the sections being adapted to be secured in the desired adjustment by means of one or more pins, h^2, engaging, respectively, registering holes in said sections. Member H braces apart the lower end of the brace A B and the lower portion of the body-portion or frame-work of the excavator.

By the construction hereinbefore described, it will be observed that the brace A B is lengthened or shortened according as screw B is turned in the one direction or the other. The screw is stationary so far as endwise movement is concerned, but by means of the engagement of the screw with the nut with which the lower section A of the brace, as hereinbefore indicated, is provided, said lower section is actuated endwise by turning the screw, resulting in the elongation or reduction of the length of the brace according as the screw is turned in the one direction or the other.

It will be observed that platform G will be elevated from the ground when the screw is turned in the one direction, and that, when the screw is turned in the opposite direction, the platform will be lowered to the ground, causing the load, or as much of it as is required to properly brace the adjacent side of the excavator, to be carried by brace A B. It will also be observed that by means of the swivel-connection of the platform with the brace, the platform is capable of nicely adjusting itself to the ground or surface upon which it rests, and that the capability of connecting member H to shorten or lengthen accommodates the lengthening and shortening of brace A B.

The means employed for operating screw B is preferably as follows: Upon said screw, preferably just below socket C, is operatively mounted a chain or pocket-pulley, B', that is engaged by an endless chain, the two chain-sections I I' (see Figs. 1 and 2), that lead from opposite sides of said pulley, respectively, passing to and over guide-sheaves K K', respectively; thence downwardly to and over guide-sheaves, L L', respectively; thence lead to and over pocket-sheaves M M', respectively, and thence lead to and engage an idler and tightener, N, where they meet. Sheaves K K' and L L' are suitably supported from the body-portion or frame-work of the excavator and pocket-pulleys M M' are loosely mounted upon a shaft O to which power is applied in any approved manner, and that is arranged transversely of and suitably supported from the frame-work or body-portion of the excavator. The block that carries idler and tightener N, is connected, by a chain or suitable connection N', with a longitudinally-slidable rod or bar, n, that is supported by a pair of brackets n' n' rigid with the body-portion or frame-work of the excavator, and is provided with a collar, shoulder or laterally-projecting member n^2 located at any suitable point between the two brackets n' n'. A coil-spring, n^3, is confined upon rod or bar n between shoulder or projection n^2 and the bracket n' that is located next adjacent the point of connection of said rod or bar with chain N'. The latter is shown leading over a guide-sheave N^2, supported from the frame-work or body-portion of the excavator. Pulleys M M' are loosely mounted upon shaft O a suitable interval apart, (see Fig. 8,) and operative connection is established between said pulleys and shaft by means of clutches, preferably friction-clutches, a clutch being provided for each pulley. Friction-clutches are shown for the purpose, and P P' designate the female and male members of the clutches, respectively. The female clutch-members are shown integral with the opposing faces of the respective pulleys and the male clutch-members are rigidly mounted upon the shaft between the pulleys and are shown integral with each other. Any suitable lever-mechanism (not shown) would be employed for actuating either pulley endwise to bring the clutch-members of the clutch for said pulley into operative connection with each other and thereby operatively connect said pulley with the driving-shaft.

By the construction hereinbefore described, and supposing shaft O to be rotated in a given direction, it will be observed that endless-chain I I' will be actuated in the one direction or the other according as pulley M, or pulley M', is, by means of the respective clutch, operatively connected with the driving-shaft, and consequently pulley B' and screw B of the bracing apparatus will be turned in the one direction or the other according as the one or the other of pulleys M M' is operatively connected with the driving-shaft. The slack in chain I I' is always found at sheave N that is

rendered adjustable and cushioned by means of spring n^3 and acts both as an idler and tightener.

I would also remark that I also preferably employ a brace, R, secured at and extending from the point where platform G is pivoted to brace A B to the central portion of the frame-work or body-portion of the excavator, and adapted to give rigidity to the bracing apparatus.

What I claim is—

1. The combination with the body-portion or frame-work of an excavating-machine, and a socket hinged to or pivotally connected with the upper portion of said body portion or frame-work, of a brace engaging said socket and composed of an upper section and a lower section, the lower section of the brace being provided, at its lower end, with a platform and having a nut, and the upper section of the brace being a screw engaging said nut and having bearing in and held to the aforesaid socket, substantially as and for the purpose set forth.

2. The combination with the body-portion or frame-work of an excavating-machine, of a brace for said body-portion or frame-work, said brace being adjustable endwise so as to be capable of shortening or lengthening and a longitudinally adjustable bar connecting the lower portion of the brace with the frame-work or body-portion, said longitudinally adjustable connecting member having a pivotal or hinge-connection with both the respective brace and frame-work or body-portion of the machine and consisting of pieces adjustable endwise of each other, substantially as and for the purpose set forth.

3. The combination with the body-portion or frame-work of an excavating-machine and a brace for said frame-work or body-portion, said brace consisting of two sections the one whereof is a screw and the other whereof has a nut engaging said screw, of reversing-gear operatively connected with the screw, substantially as and for the purpose set forth.

4. The combination with the body-portion or frame-work of an excavating-machine, and a brace for said frame-work or body-portion, said brace consisting of two sections the one whereof is a screw and the other whereof has a nut engaging said screw, of a rotating-shaft, two pulleys loose on the shaft, a clutch for each pulley for establishing operative connection between said pulley and the shaft, an idler in suitable proximity to said pulleys, a pulley on the aforesaid screw and an endless-chain or belt operatively connecting the pulley on the screw with the pulleys on the shaft, said chain or belt passing from the one pulley on the shaft to and over the aforesaid idler and thence to and over the other pulley on the shaft, substantially as and for the purpose set forth.

In testimony whereof I sign this specification, in the presence of two witnesses, this 1st day of November, 1893.

GEORGE W. KING.

Witnesses:
C. H. DORER,
ROLLA C. PERRY.