

No. 819,147.

W. H. LANG.

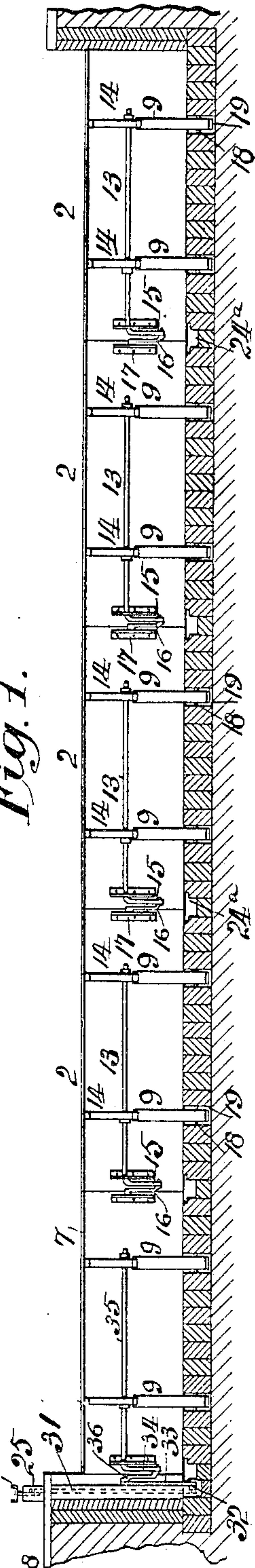
PATENTED MAY 1, 1906.

FLASH BOARD FOR DAMS.

APPLICATION FILED AUG. 9, 1905.

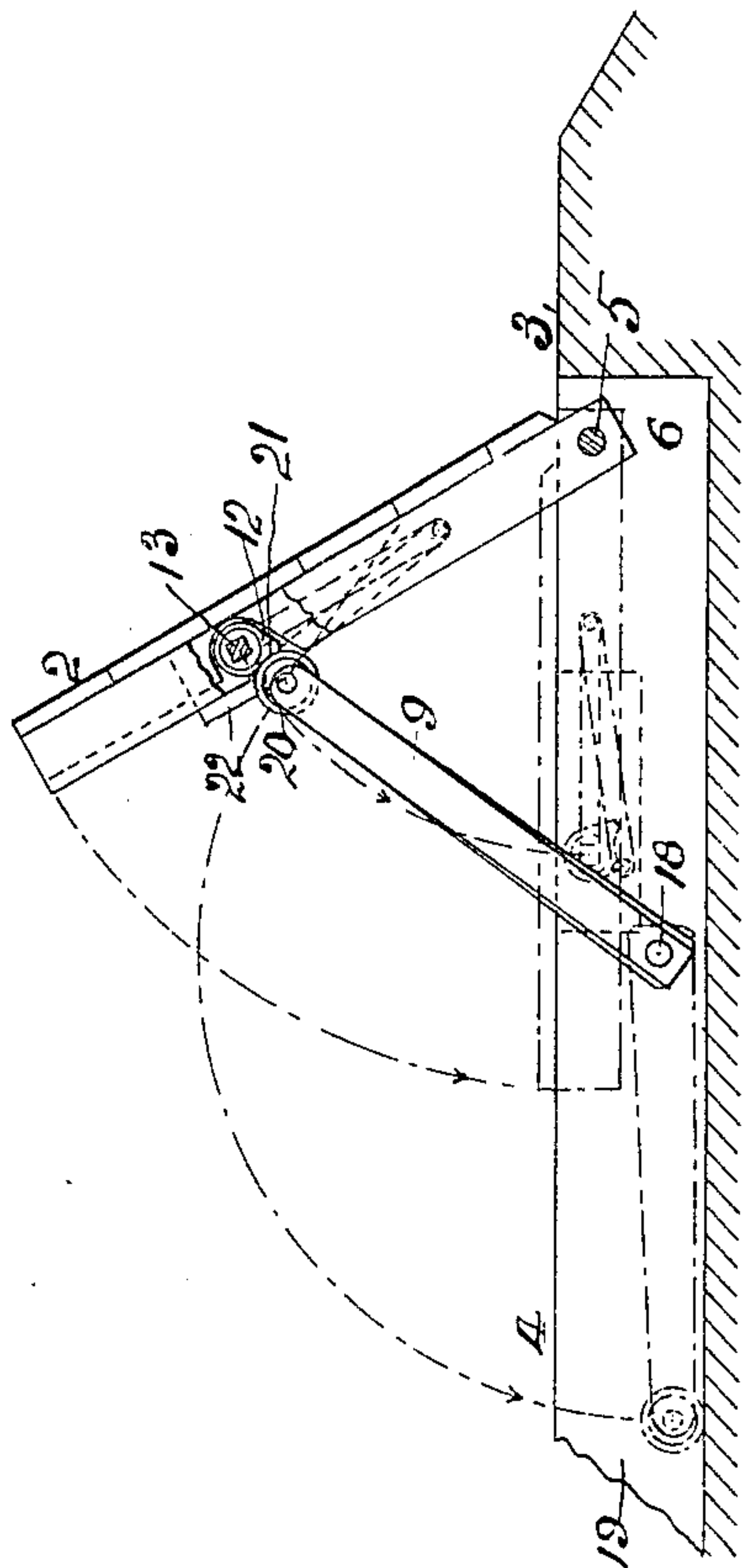
3 SHEETS—SHEET 1.

Fig. 1.



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*M. J. McJannet*  
G. Domenice.

Fig. 2.



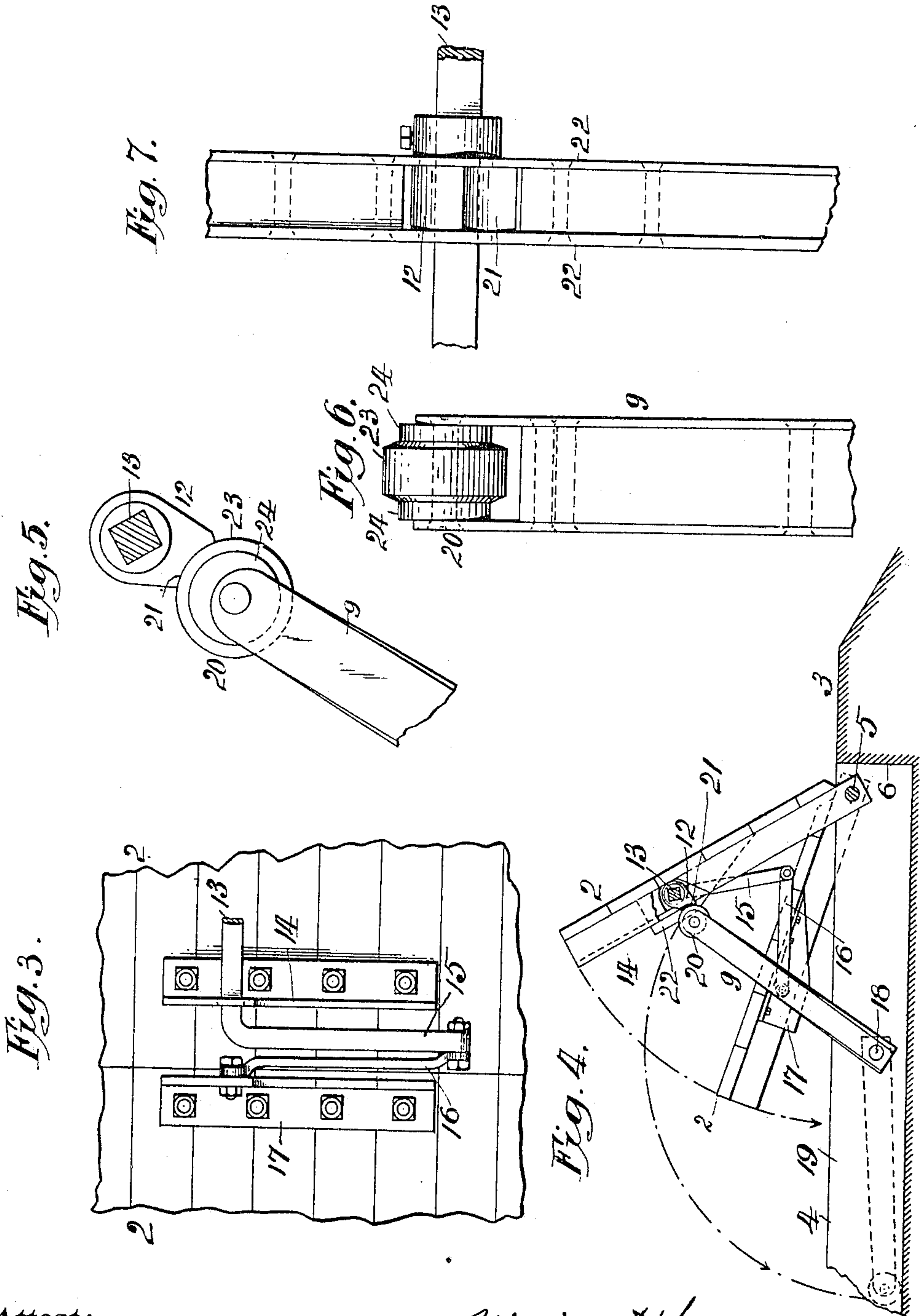
William H. Lang Inventor:  
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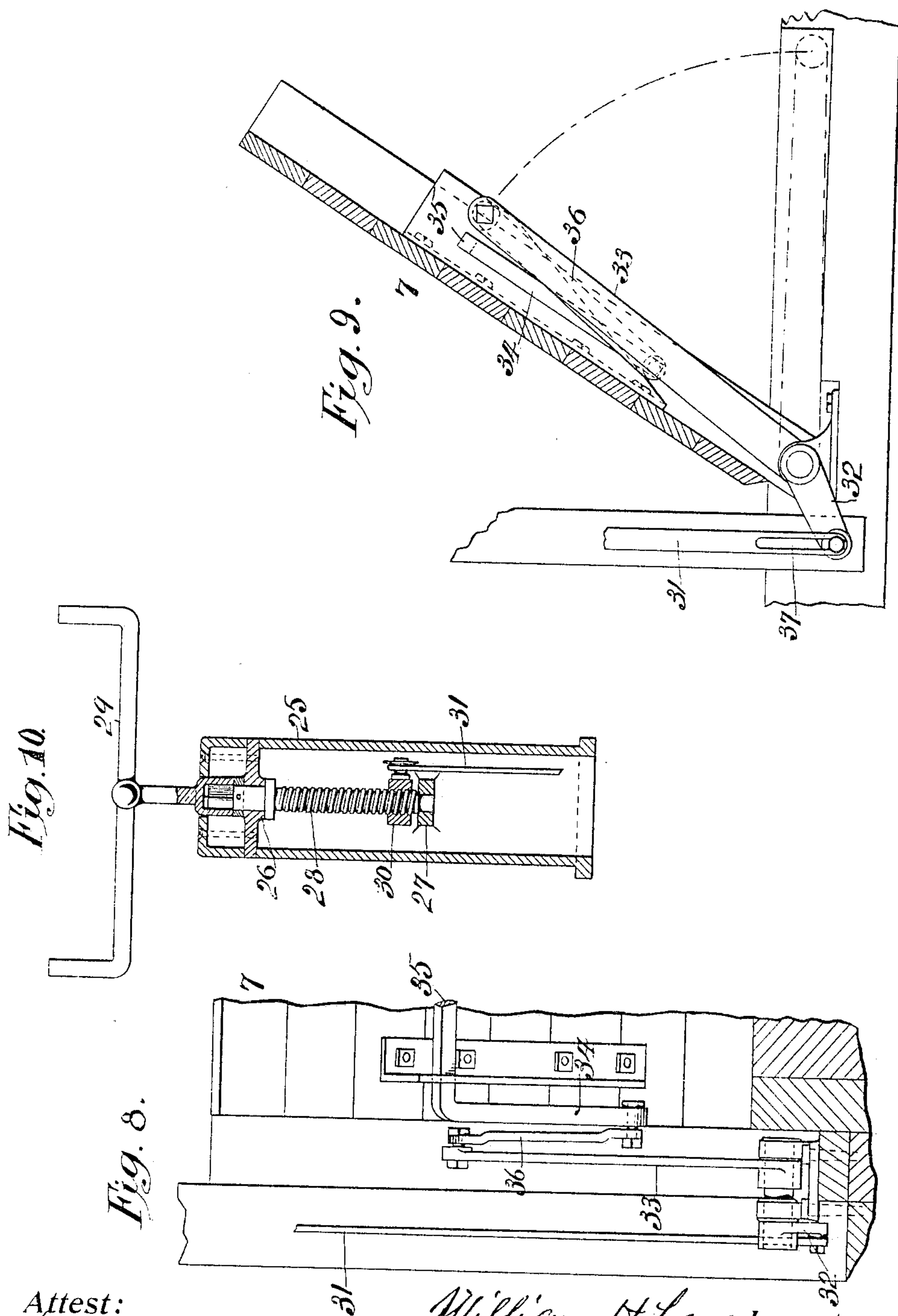
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3 SHEETS—SHEET 3.



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# UNITED STATES PATENT OFFICE.

WILLIAM H. LANG, OF NEW ORLEANS, LOUISIANA, ASSIGNOR TO  
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## FLASH-BOARD FOR DAMS.

No. 819,147.

Specification of Letters Patent.

Patented May 1, 1906.

Application filed August 9, 1905. Serial No. 273,351.

*To all whom it may concern:*

Be it known that I, WILLIAM H. LANG, a citizen of the United States, and a resident of New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Flash-Boards for Dams, of which the following is a specification.

My invention relates to the construction of mill-dams, and particularly to the construction of flash-boards therefor; and the invention consists, mainly, in such construction of the flash-boards that the falling of the initial one at the end of the dam will automatically cause a like falling movement to be imparted to all the others throughout the whole series, thus enabling the dam to be quickly relieved, particularly in case of sudden flood or other emergency.

The invention also consists in the construction, arrangement, and combination of parts, all as hereinafter described and claimed.

In the accompanying drawings, to which reference is made and which form a part of this specification, Figure 1 is a sectional elevation of a dam, illustrating diagrammatically my invention applied thereto, the flash-boards being in elevated position. Fig. 2 is a like view showing the crest and apron of the dam and illustrating a flash-board in its two positions. Fig. 3 is an elevation showing the ends of two flash-boards in elevated position. Fig. 4 is an edge view of the same, illustrating the operation. Figs. 5, 6, and 7 are detailed views of one of the struts or braces and tripping-shaft and cam. Fig. 8 is a front elevation showing the means for tripping the initial flash-board. Fig. 9 is a side elevation of the same, and Fig. 10 is an enlarged sectional view of the operating-screw and connections for operating the initial tripping mechanism.

In the drawings, 2 designates a series of flash-boards mounted on the crest 3 of the dam, each being so hinged as to be adapted to be elevated to the position shown in full lines in Figs. 1 and 2 or lowered to the position shown in dotted lines in Fig. 2. I prefer to hinge the flash-boards to a rod 5, located adjacent to the breasts 6 of the crest of the dam.

7 designates the first flash-board in the series, located at one end of the dam, which, as

here shown, is the initial one to be tripped from the abutment 8.

Each flash-board in the series is adapted to be held in elevated position by one or more, preferably two, struts or braces 9 and is provided with a tripping device for throwing out the struts or braces for allowing the flash-boards to fall back to horizontal position. The tripping device, as here shown, comprises a projection 12, preferably in the form of a cam secured upon a shaft 13, journaled in suitable bearing plates or flanges 14 at the back of the flash-boards. The shafts 13, one at the back of each flash-board, are provided with arms or levers 15, located at that end of the flash-board which is nearest to the initial flash-board 7. The opposite end of each flash-board is provided with a toggle or link 16, pivoted to a bearing plate or flange 17 and connected at its lower end to the adjacent arm or lever 15 of the shaft 13, as clearly illustrated in Figs. 1 and 3.

The struts or braces 9 are pivoted to the apron 4 of the dam on rods or bolts 18, and by preference suitable recesses 19 are formed in the apron of the dam to receive the struts or braces when they fall back to horizontal position, as shown in dotted lines in Figs. 2 and 4. The free ends of the struts or braces are by preference provided each with a roller 20, which when in operative position fits in a recess 21, formed in the cams 12. The said cams 12 are confined between plates or cheek-pieces 22 22; Figs. 4 and 7, and these form channels for the rollers 20 to hold the struts or braces from lateral displacement. I prefer to form the rollers with a central tread 23 and with side treads 24 24 of smaller diameter, the latter being adapted to contact with the outer edges of the flanges 22, while the central portion 23 of larger diameter rests in the recess 21 of the cams 12. In this way not only is the structure made reliable and yet easy of operation, but all frictional contact of metal with wood is obviated. Recesses 24<sup>a</sup> are formed in the apron 4 of the dam to receive the levers 15, the links 16, and the bearing-flanges when the flash-boards are lowered to horizontal position, thus relieving the structure from danger of injury from logs or other objects that may go over the dam.

On the abutment 8 is mounted a casing 25, provided with bearings 26 27, in which is



journalled a worm 28, so that when turned by a wrench 29 it raises and lowers the block 30, which by a rod 31 is connected to the short arm 32 of a lever, which trips the initial flash-board 7. The long arm 33 of the said lever is connected to the arm or lever 34 of the tripping-shaft 35 by a link 36. The lower end of the connecting-rod 31 is slotted at 37 to permit the short arm 32 to have vertical movement independently of the connecting-rod.

The operation is as follows: The flash-boards being in elevated position, the screw 28 will be turned to lift the block 30 and the short arm 32 of the operating-lever. This will cause the long arm 33 of the said lever to be carried back to horizontal position, as shown in dotted lines in Fig. 9, causing the link 26 and arm or lever 34 to turn the shaft 35, which will trip the first pair of struts or braces 9 and allow the initial flash-board 7 to fall back upon the apron of the dam. This movement of the initial flash-board 7 will cause its link or toggle 16 to turn the trip-shaft 13 on the adjacent flash-board, which movement of said shaft will trip the second pair of struts or braces 9, and the falling movement of the second flash-board in the series will trip the third, as illustrated in Fig. 4, and so on, automatically and successively throughout the whole series.

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

1. A series of flash-boards for a dam, supports for holding them in elevated position and means operated by the falling of one flash-board for tripping the supports for the next in the series, substantially as described.

2. In a dam a plurality of flash-boards hinged at their lower edges to the crest of the dam, a shaft carried by each flash-board, connected links or toggles and a series of braces or struts whereby whenever a falling movement is imparted to the end flash-board a like movement will be successively imparted to each adjoining flash-board, substantially as described.

3. A flash-board for a dam hinged at its lower edge to the crest of the dam combined with a shaft, above said hinge an arm or lever at one end of said shaft and one or more tripping devices operated by said shaft, substantially as described.

4. A flash-board for a dam combined with a shaft, an arm or lever at one end of said shaft, one or more tripping devices operated by said shaft, and means secured to the flash-

board for operating a trip-shaft, substantially as described.

5. In a dam a pair of flash-boards hinged to the top of the dam, a shaft carried by each of said flash-boards, an arm or lever at one end of each shaft, one or more tripping devices for each shaft, means for supporting the flash-boards in elevated position and a link or toggle at one end of each shaft, substantially as and for the purposes described.

6. In a dam a series of flash-boards and a series of struts or braces hinged to the dam, a shaft at the back of each flash-board, an arm or lever at one end of each shaft, a link or toggle connected to said arm or lever and connected to the adjacent flash-board and one or more tripping devices operated by said shafts for tripping the said struts or braces, substantially as described.

7. A flash-board for a dam, a shaft carried by said flash-board, an arm or lever at one end of said shaft a cam formed with a recess in its outer surface and a strut or brace arranged to enter said recess substantially as described.

8. A flash-board for a dam, a shaft carried by said flash-board, an arm or lever at one end of said shaft, a tripping device operated by said shaft, plates or cheek-pieces adjacent to said tripping device forming a channel and a strut or brace hinged to the dam and adapted to engage said tripping device and held from lateral movement by said cheek-pieces substantially as described.

9. In a dam an initial flash-board hinged to the top of the dam, a shaft carried by the said flash-board, an arm or lever at one end of said flash-board, a tripping device operated by said shaft, a strut or brace hinged to the dam and means operated from an abutment for turning said shaft substantially as and for the purposes described.

10. In a dam, a flash-board hinged at one end of the dam, a shaft carried by said flash-board, an arm or lever at one end of said shaft, a link or toggle connected at one end to said arm or lever and at the other to the long arm of a lever, a connecting-rod attached to the short arm of said lever means for raising and lowering said connecting-rod, and another flash-board, a shaft having an arm carried thereby and a link connected to the last-mentioned arm substantially as and for the purposes described.

WILLIAM H. LANG.

Witnesses:

THEO. S. FORTIER,  
G. LÉON GONLAT.