No. 838,093. PATENTED DEC. 11, 1906.

C. M. EMMONS.

BULKHEAD.

APPLICATION FILED MAY 22, 1905.

2 SHEETS—SHEET 1.

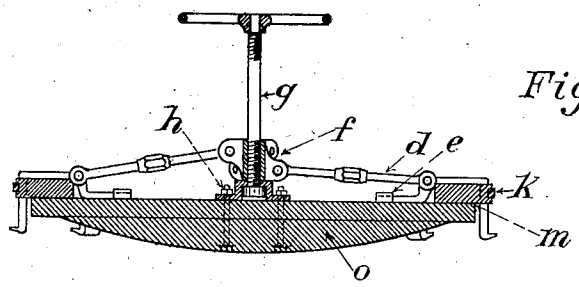


Fig. 1.

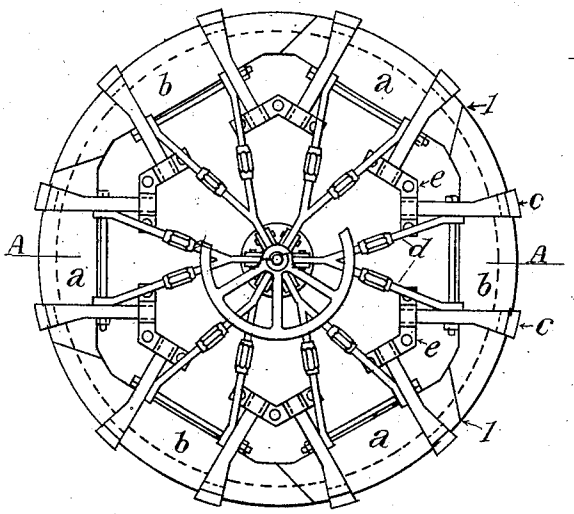


Fig. 2.

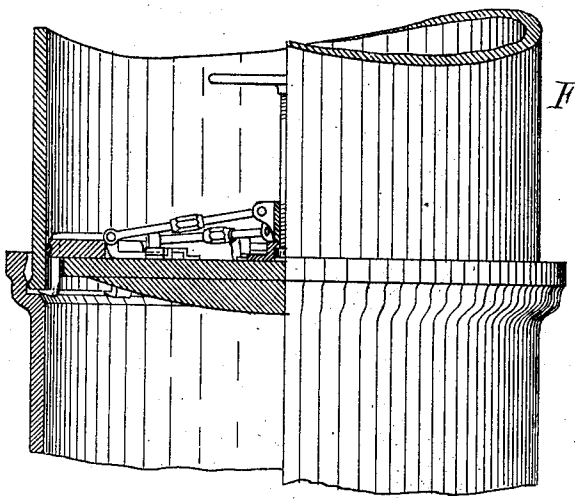


Fig. 3.

WITNESSES:

Chas. F. Bond

Harry P. Shaver.

INVENTOR

Chas. M. Emmons

BY

W. S. Morrison

ATTORNEY

THE NORRIS PETERS CO., WASHINGTON, D. C.

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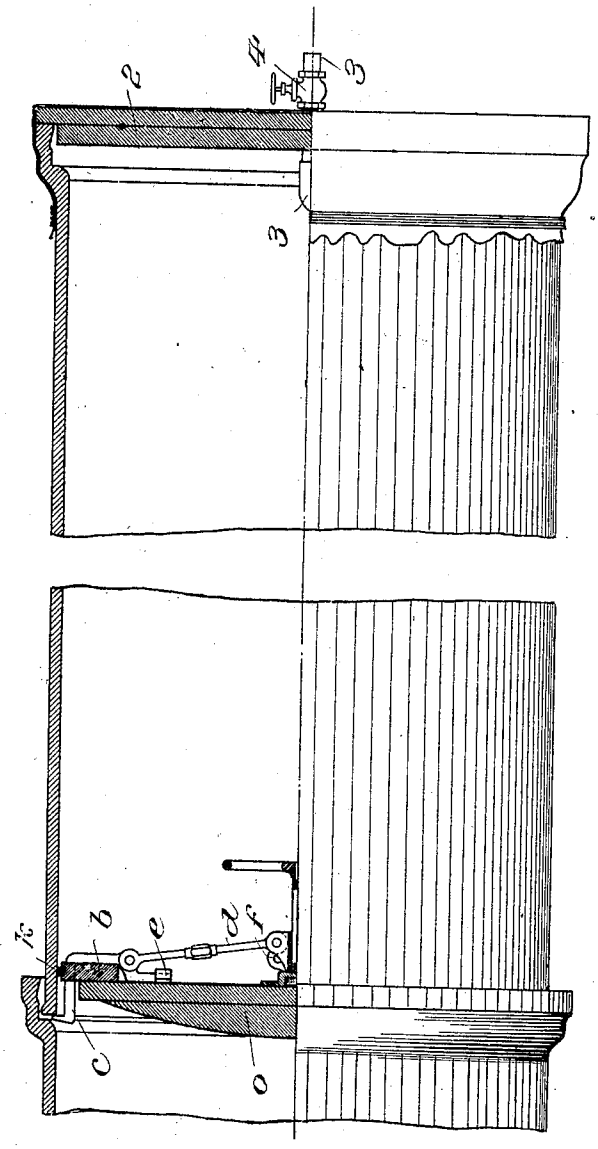


Fig. 4.

WITNESSES:

E. R. Peck.

INVENTOR

Chas. M. Emmons

BY

Asst. ATTORNEY

THE NORRIS PETERS CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CHARLES M. EMMONS, OF BEAVER FALLS, PENNSYLVANIA.

BULKHEAD.

No. 838,093. Specification of Letters Patent. Patented Dec. 11, 1906.

Application filed May 22, 1905. Serial No. 261,725.

To all whom it may concern:

Be it known that I, CHARLES M. EMMONS, a citizen of the United States, residing at Beaver Falls, in the county of Beaver and State of Pennsylvania, have invented certain new and useful Improvements in Bulkheads; 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 appertains to make and use the same.

My invention relates to bulkheads for closing the ends of large pipes; and the object of my invention is to facilitate the laying of large pipes under water by closing the ends of the pipe with bulkheads, utilizing the buoyancy of the inclosed air in supporting the pipe and dispensing with the use of any outside floats while the pipe is being lowered and placed in position, the adjustable bulkhead being used in conjunction with a simple bulkhead in the opposite end of the pipe having a valve attachment for letting water into the pipe or pumping water out. I attain these objects with the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a section of the bulkhead in the line A A, Fig. 2. Fig. 2 is a plan of the bulkhead with part of the operating-wheel broken off. Fig. 3 is a pipe-joint, shown partly in section and showing the bulkhead in place. Fig. 4 is a sectional elevation of the bell of one pipe-section and both end portions of another pipe-section having its ends sealed by the expansible bulkhead and by a simple or outer bulkhead.

Similar characters refer to similar parts throughout the several views.

o is the fixed part of the bulkhead, constructed of light wood to give buoyancy, and is made of somewhat less diameter than the pipe in which it is to be used. *a* and *b* are segments of the adjustable part of the bulkhead, also made of wood or light material and cut to the circle of the interior of the pipe.

c c are dogs, of steel or other metal, fastened to the segments *a* and *b* and designed to bear against the ends of the pipe and sustain the pressure of the water on the outside of the bulkhead.

e e are guides for holding the back ends of the dogs *c c*.

d d are adjustable arms for operating the segments and are attached at their inner ends to the nut *f*, operated by the screw *g*. The arms *d* are rendered longitudinally adjustable, preferably by being formed in sections united by turnbuckles, about as shown. The arms operating segments *a a* are attached to the nut *f* higher up than those operating sections *b b*, causing sections *a a* to move toward the center more rapidly than the sections *b b*.

K is a packing of rubber or other suitable material.

l and *m* are joints to be fitted with packing, if necessary.

In Fig. 4 I show a pipe-section as though sunk with its spigot end inserted in the bell of a previously-laid pipe and showing the bulkheads therein and ready for removal. The outer or simple bulkhead 2, of any suitable construction, is removably secured by suitable means against the end edge of the bell end of the pipe-section. The solid or outer bulkhead 2 is provided with pipe connections 3, extending therethrough and having suitable stop-cocks or valves 4, whereby water can be admitted to the interior of the pipe-section for gradually sinking the same, or whereby water can be pumped therefrom when it is desired to raise a sunken pipe-section, or for other purposes.

The usual method of operation would be after several sections of pipe have been jointed together on shore to place this bulkhead in position in the spigot end, carefully adjusting it to make it water-tight, and place the simple bulkhead in the bell or opposite end, then launch the pipe and float it to position, and thereby letting some water into the pipe to sink it to place in the trench and enter the spigot end into the pipe already laid as far as the dogs will permit. This will be seen to be sufficient (by referring to Fig. 3) to permit of calking the joint. The joint can then be calked in the usual way. When this is completed, the diver removes the outer bulkhead and then entering the pipe releases and removes the adjustable bulkhead.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A pipe-section, in combination with a removable bulkhead fitting against and clos-

ing one end thereof, and a bulkhead within and closing the opposite end thereof and removable through the pipe-section and provided with adjustable outwardly-projecting stops lapping the end edge thereof for maintaining the bulkhead in place against the water-pressure.

2. A pipe-section, in combination with a removable bulkhead adapted to fit within and close the spigot end of said section and provided with radially-adjustable stops for engaging a shoulder thereof to maintain the bulkhead against the water-pressure, and a removable bulkhead adapted to fit against and close the bell of said section, one of said bulkheads provided with a valved pipe connection therethrough.

3. An expansible bulkhead adapted to be expanded within a pipe and form an approximately water-tight closure for an end thereof and provided at its inner face with operating means whereby the bulkhead can be expanded and contracted, said bulkhead also provided with longitudinally-extending stops to lap a shoulder of the pipe to maintain the bulkhead against the water pressure.

4. A pipe-section, in combination with an expansible bulkhead provided with operating means and forming an approximately water-tight closure for an end of the section and provided with stops lapping the end edge of the section, substantially as described.

5. A pipe-section, in combination with an expansible bulkhead arranged within one end of the pipe-section and provided with operating means at its inner side and within the pipe-section, and with stops projecting beyond its outer side to lap the end edge of the section, substantially as described.

6. A pipe-section having a spigot end, in combination with a bulkhead located within said end and forming an approximately water-tight closure for said end and provided with stops lapping the outer edge of said end, substantially as described.

7. A bulkhead comprising movable segments, operating means therefor, and dogs or stops carried by the segments and adapted to lap the end edge of a pipe-section.

8. An expansible bulkhead adapted to fit within and expand against the inner surface of the end of a pipe-section, and provided with operating means, and with dogs to lap over the end edge of said section, substantially as described.

9. A bulkhead comprising a body or disk, overlapping edge segments, means for adjusting said segments radially to increase or diminish the diameter of the bulkhead comprising mechanism whereby said segments move at different rates of speed, substantially as described.

10. A bulkhead comprising a main body or disk, edge segments sliding radially thereon and provided with packing at their outer edges, and adjusting means connected with the segments for simultaneously adjusting them radially on said disk for varying the diameter of the bulkhead.

11. A bulkhead comprising radially-movable segments, each segment provided with and carrying dogs to lap the end edge of a pipe-section, and means for adjusting the segments.

12. A bulkhead comprising a main body or disk, edge segments movable radially and overlapping at their ends and forming the periphery of the bulkhead, and means for simultaneously moving all of the segments radially and for moving certain segments at a different rate of speed from the remaining segments, substantially as described.

13. A bulkhead comprising a disk, radially movable edge segments overlapping at their ends and slidable on the side face of the disk and projecting beyond the edge thereof, and adjusting means carried by the disk and connected with said segments for simultaneously moving them radially to vary the diameter of the bulkhead.

14. A bulkhead comprising a disk, radially-movable edge segments, a central threaded shaft mounted on the disk, a nut on the shaft, and connecting-rods from the nut to the segments, substantially as described.

15. A bulkhead comprising a disk, radially-movable segments, a centrally-arranged nut, means for moving the nut toward and from the disk, and adjustable connecting-rods between the nut and segments, certain of said rods being connected to the nut in a different transverse plane from that of the connection of the remaining rods to the nut, substantially as described.

16. A bulkhead comprising a disk, radially-movable segments arranged on the disk, guides carried by the disk, dogs fixed to the segments and projecting therefrom laterally and portions projecting inwardly from the segments and working in said guides, and means for simultaneously moving all of the segments radially of the disk, substantially as described.

17. A bulkhead comprising a disk, a series of overlapping radially-movable segments arranged on the disk and projecting beyond the edge thereof and provided with outer edge packing, and means carried by the disk for simultaneously moving all of the segments to vary the diameter of the bulkhead.

18. A bulkhead comprising a disk, a centrally-arranged rotary threaded shaft carried by and projecting from the disk and provided with a handle, a nut on the shaft and movable longitudinally thereof, slidable segments forming the surrounding edge of the

abutment and connected with and moved by said nut to vary the diameter of the abutment.

19. A bulkhead adapted to fit within the interior of a pipe-section and provided with projecting dogs adapted to extend longitudinally of the pipe-section and lap over the end edge thereof, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES M. EMMONS.

Witnesses:
CHAS. F. BOND,
HARRY P. SHARRER.