(No Model.)

C. H. COOLEY.

REGULATOR FOR GRAIN SCALES.

No. 410,138. Patented Aug. 27 1889.

Fig. 1

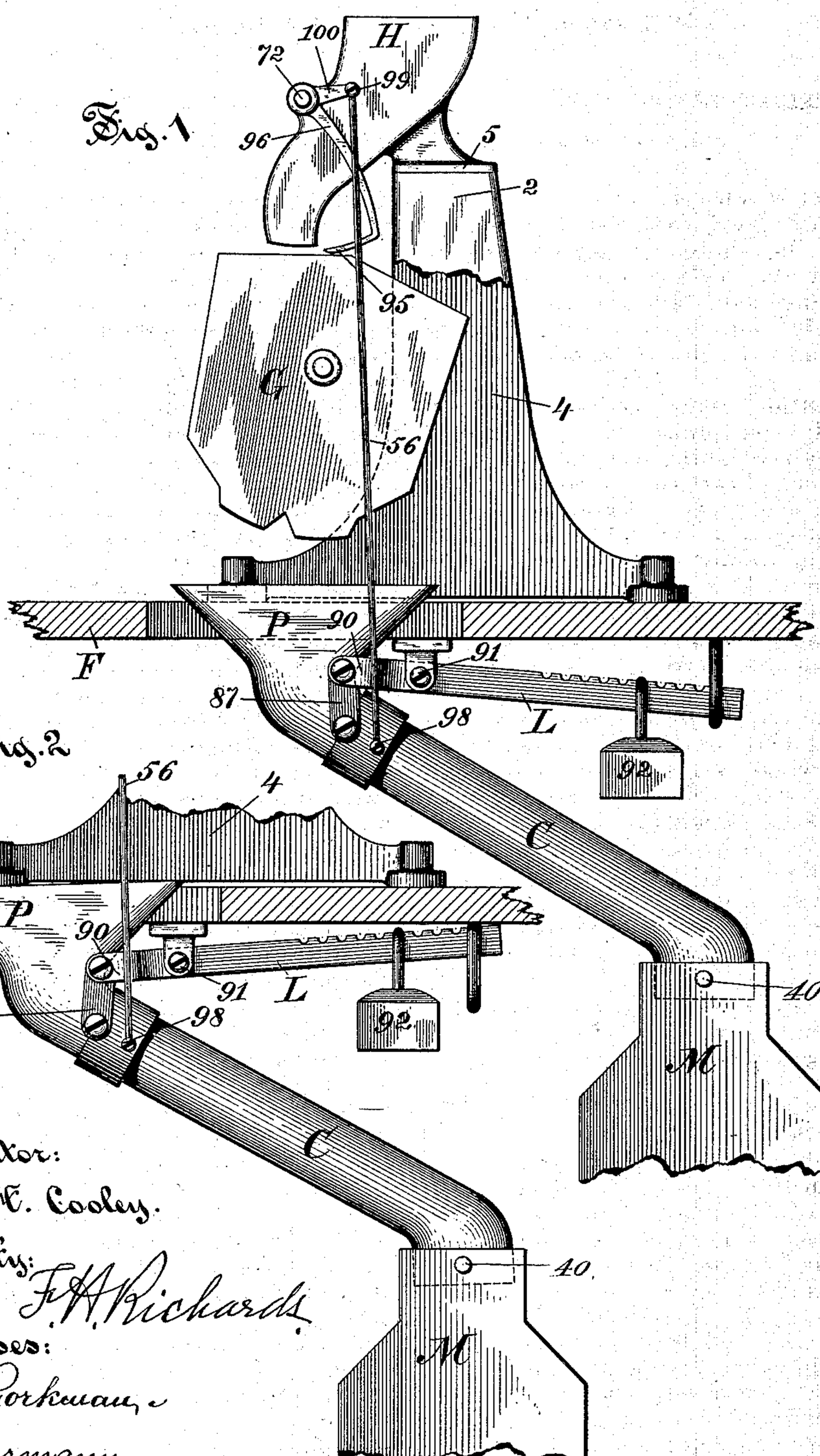

Fig. 2

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UNITED STATES PATENT OFFICE.

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REGULATOR FOR GRAIN-SCALES.

SPECIFICATION forming part of Letters Patent No. 410,138, dated August 27, 1889.

Application filed January 17, 1889. Serial No. 296,678. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. COOLEY, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Regulators for Grain-Scales, of which the following is a specification.

This invention relates to regulators for automatically controlling the operation of automatic grain-weighing machines, and more especially when these are operated in connection with some grain-working machine—as, for instance, a roller-mill—the object being to regulate the supply of grain to a grain-receiving machine of a given capacity by retarding as required the operation of a grain scale or meter of relatively larger capacity arranged to deliver grain to said receiving-machine.

To this end the invention consists in the improvements hereinafter more fully set forth.

In the drawings accompanying and forming a part of this specification, Figure 1 is a side elevation of a regulator apparatus embodying my improvements. Fig. 2 is a similar view of the principal parts of the apparatus shown in the preceding figure and illustrates the mode of operation of said apparatus.

Similar characters designate like parts in both the figures.

My improved regulator apparatus is adapted to be used in connection with automatic grain-scales generally and especially in connection with the improved grain-scale or grain-meter which is described in my prior application, Serial No. 262,850, filed February 3, 1888; and in this present application such details and parts as are common to both of said applications are generally designated by the same characters. Accordingly the following parts are or may be the same parts as are similarly designated in the said prior application—to wit, the grain-scale frame 4, the double-chambered grain-bucket G, the supply hopper or chute H, valve-shaft 72, arm or arms 96, carrying the regulator-valve 95, the vertically-movable regulator-hopper P, (excepting the connections supporting the same,) the connection 56, pivoted at 99 to the valve-arm 100 and actuating said valve 95. The necessary and usual means for carrying and operating the grain-bucket are not shown in this application.

Underneath the bucket and for receiving the grain discharged therefrom I arrange a vertically-movable inclined conduit C, having a hopper P of suitable form and arrangement to guide into said pipe or conductor C the grain discharged from the bucket. This conduit is supported at its lower end on a fixed pivot 40, which sustains a large proportion of the weight of the pipe and of the grain therein, and at its upper end by counterbalancing the same on links 87 between the arms 90 of the lever L, which lever is pivotally supported at 91, and has on the rear end thereof a regulator-weight 92 of sufficient weight to raise said conduit, together with a small quantity of grain therein. When the conduit C, being heavily loaded, descends by the weight of the grain therein, as shown in Fig. 2, it acts through the connecting-rod 56 to close a regulator-valve 95 under the hopper or chute H, and thus stop the flow of grain to and consequently the operation of the grain-scale. The valve 95 remains closed until the gradual discharge of the grain from the pipe C into the grain-receiving machine or chamber M permits the counter-balance to lift the said pipe and again open the regulator-valve. The regulator-valve 95 is suspended by arms 96 from the cut-off-valve shaft 72, (as in my aforesaid application,) or from some point adjacent thereto. The regulator-valve may be operatively connected by any well-known means with the lever L, provided such connection is so made that the downward movement of pipe C throws said valve forward, and vice versa.

The operation of this regulator apparatus will be readily understood from the drawings and preceding description.

When the grain passes freely through conduit C, the hopper P rises and the connections draw back the valve 95, as in Fig. 1; but when the grain accumulates sufficiently in said pipe by its weight it carries down the said pipe, as in Fig. 2, thereby moving forward valve 95 under the spout H, as shown in said figure. This apparatus is not in the nature of a "stop-motion," but operates to retard or temporarily to stop the operation of the machine and afterward to start the same

again as the grain passes out of the counterbalanced conduit.

In this improved regulator the inclined conduit serves two distinct purposes: first, as an ordinary conductor leading to the grain-receiver, and second, as a regulator-hopper, in which the weight of the grain is largely sustained on a fixed point, whereby a portion only of that weight is effective to operate the regulator-valve, and whereby the weight of the grain becomes more effective for said purpose in proportion as it lies near the upper end of said pipe. Thus there is a difference of efficiency of the same mass of grain, according to its position in the movable hopper-pipe. When at or near the lower end of said pipe, the weight is almost wholly sustained on the pivot; but when near the upper end thereof said weight is almost wholly borne on the counterweighted lever and becomes more effective to move the valve. By these means a grain-scale of a given size may be successfully operated under conditions which otherwise would render the same impracticable. In practice, owing to the friction and inertia of the several parts, and especially the resistance of the grain on the regulator-valve, a much larger quantity of grain is required to be in the pipe C to close said valve than is required to retain the valve closed after the closing of the same has been accomplished. This feature and the variation in efficiency of the grain due to its varying position as it moves down in said pipe render my present improvements peculiarly adapted for use in connection with grain-scales working under varying conditions where the discharge of grain is sometimes much less than the normal capacity of the machine.

It should be understood that the valve 95 may operate in combination with the cut-off valve or valves, as described in my aforesaid application, or it may be placed higher up and enter the spout H through a slot in the rear wall thereof, as shown by dotted lines in Fig. 8 of said application.

Having thus described my invention, I claim—

1. In apparatus for regulating the discharge of grain, the combination of the fixed chute, the inclined conductor supported at its lower end and counterbalanced, substantially as described, and the regulator-valve, said conductor being operatively connected with said valve to close the same on the downward movement of the conductor, all substantially as described.

2. In a regulator for grain-scales, the combination, with the inclined receiving-pipe C, sustained in part by a fixed pivot at its lower end and supported at its upper end by a counter-balance, normally upholding said pipe when the same is empty or nearly empty of grain, of the regulator-valve above said conduit, and connections, substantially as described, actuating said valve to close the same on the downward movement of said pipe, substantially as described.

3. In a regulator for grain-scales, the combination, with the chute and the regulator-valve, of the pipe C, pivotally supported at its lower end, weighted lever L, links 87, and rod 56, substantially as shown and described.

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