(No Model.)

2 Sheets—Sheet 1.

P. FEATHER & M. J. CLARK.

REGULATOR FOR BRAMWELL FEEDERS.

No. 562,220. Patented June 16, 1896.

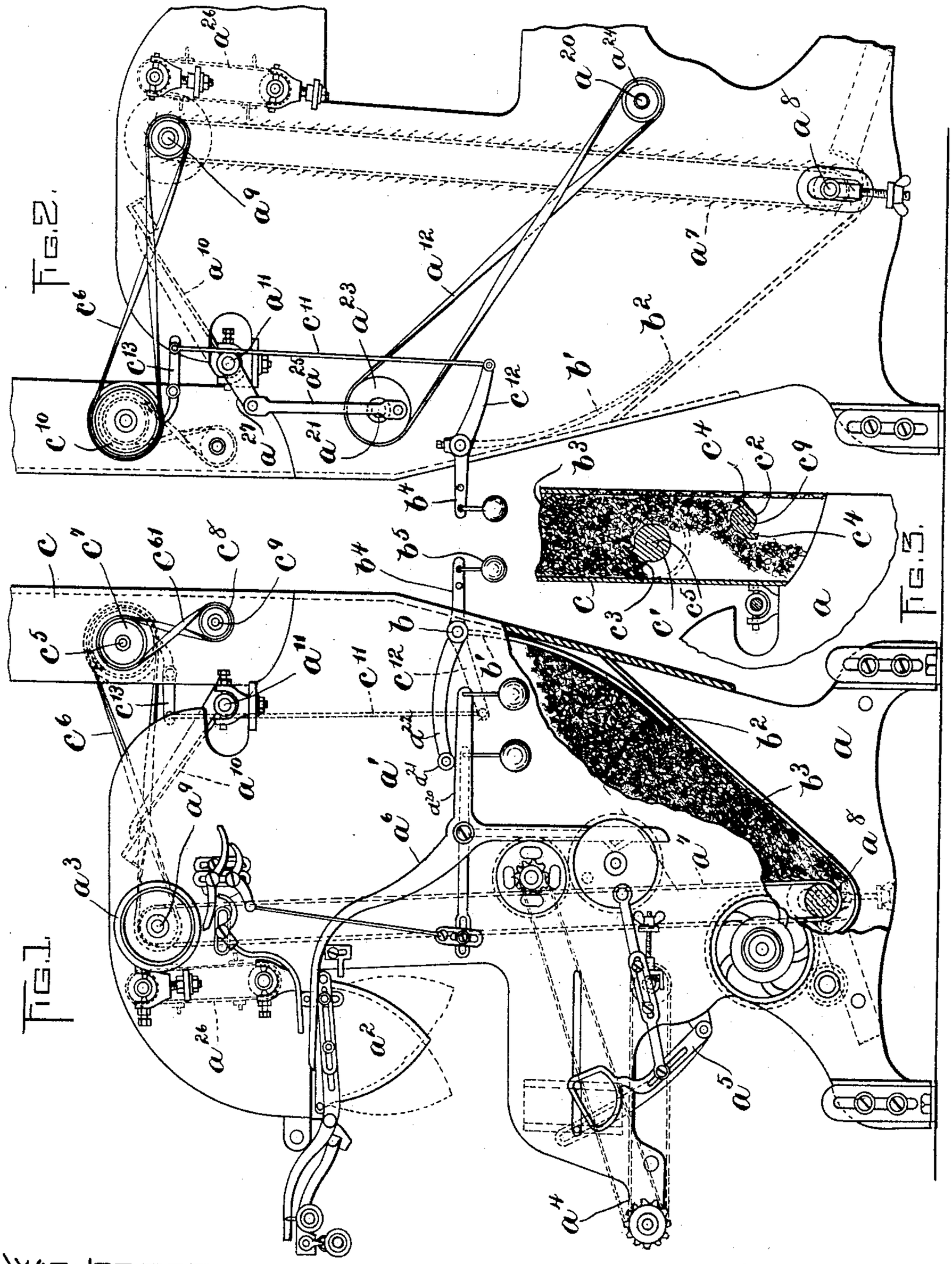

FIG. 1.

FIG. 2.

FIG. 3.

WITNESSES

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FIG. 5.

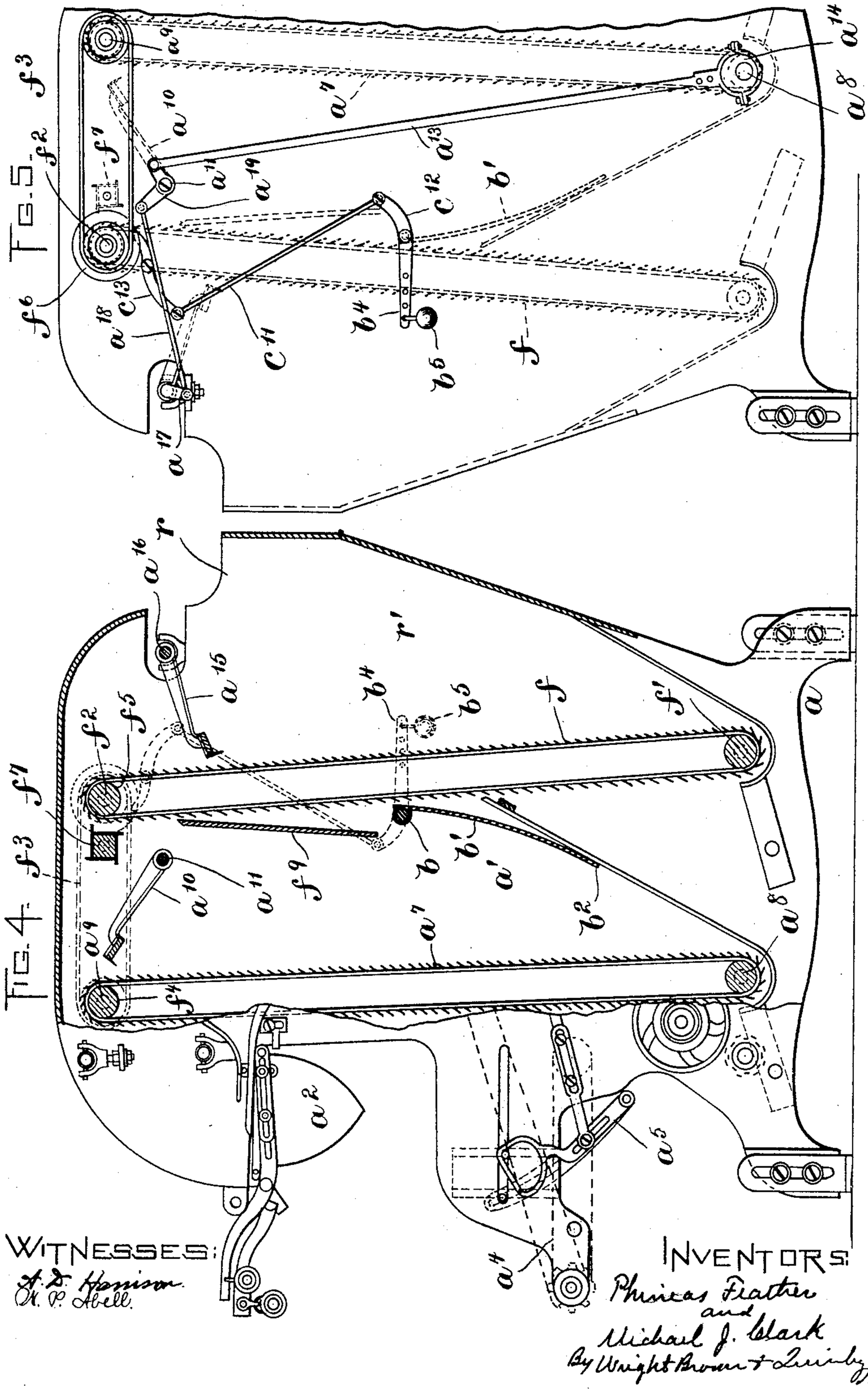

FIG. 4.

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UNITED STATES PATENT OFFICE.

PHINEAS FEATHER AND MICHAEL J. CLARK, OF STOW, MASSACHUSETTS.

REGULATOR FOR BRAMWELL FEEDERS.

SPECIFICATION forming part of Letters Patent No. 562,220, dated June 16, 1896.

Application filed July 8, 1895. Serial No. 555,695. (No model.)

To all whom it may concern:

Be it known that we, PHINEAS FEATHER, a subject of the Queen of Great Britain, and MICHAEL J. CLARK, a citizen of the United States, residing at Stow, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Regulators for Bramwell Feeders, of which the following is a specification.

This invention relates to a new and improved regulator for Bramwell feeders; and it consists in the novel features of construction and relative arrangement of parts hereinafter fully described in the specification, clearly illustrated in the drawings, and particularly pointed out in the claims.

Reference is to be had to the accompanying two sheets of drawings, forming a part of this application, in which like characters indicate like parts wherever they occur.

In the drawings, Figure 1 represents a side elevation of a Bramwell feeder equipped with our improved regulator. Fig. 2 represents a view similar to Fig. 1, but taken from the opposite side of the machine. Fig. 3 represents a detailed view of the chute. Figs. 4 and 5 are views similar to Figs. 1 and 2, and represent a modified form of my regulator.

In the use of Bramwell feeders as at present constructed, and by the term "Bramwell feeder" we wish to be understood as including not only the style of machine that bears this name, but also any first-breaker feeder, it is necessary to place the stock into the chamber of the feeder by hand when the chamber becomes empty. It thus happens that the same amount of stock is not always presented to the spike or lifting apron, and hence the amount of stock carried to the scales varies. When the stock in the chamber becomes low, only small quantities are delivered to the scales. This uneven delivery of the spike-apron is found in practice to be a serious defect in this class of machines, and it is to overcome this objection that we have invented what we term our "feed-regulator." This regulator includes mechanism whereby the amount of stock presented to the spike or lifting apron is kept constant, so that the said apron can have a uniform rate of delivery, which would not be possible in the old style of feeders. Moreover, by our regulator we are enabled, if desired, to dispense with the scales of the Bramwell feeder, since the spike or lifting apron can be made to deliver at a uniform predetermined rate by reason of its having presented to the action of its spikes a uniform predetermined amount of stock. This it can deliver direct to the feed-apron without the intermediate step of the scales, whose function is rendered unnecessary by the uniform delivery of the spike-apron.

We have shown in the drawings the general features of a conventional Bramwell feeder, but, as already cited, our invention applies to any first-breaker feeder.

The framework a, the chamber a', the scale-pan a^2, the clutch a^3, the apron a^4, the lever systems $a^5\,a^6$, the spike or lifting apron a^7 and its shafts $a^8\,a^9$, the vibrating comb a^{10} may be, and preferably are, of the usual construction and arrangement, and need no additional description here. The vibrating comb a^{10}, that is mounted on the shaft a^{11}, may be run, as shown in Fig. 2, by means of a belt a^{12}, or, as shown in Fig. 5, by means of a pitman a^{13}, mounted at one end upon an eccentric a^{14}, on the shaft a^8, and connected at its other end to the comb, the latter being mounted upon a shaft a^{11}.

In Figs. 4 and 5 we show a supplemental vibrating comb a^{15}, mounted upon a shaft a^{16}, suitably arranged in the framework of the machine. An arm a^{17}, fast upon the shaft a^{16}, is connected by a rod a^{18} to an arm a^{19}, fast upon the shaft a^{11}, so that we are enabled to vibrate both combs by the pitman a^{13}.

In Fig. 2 the belt a^{12} is shown as connecting two pulleys $a^{24}\,a^{23}$, fast upon two counter-shafts $a^{21}\,a^{20}$. A pitman a^{25} connects the pulley a^{23} with an arm a^{27}, fast upon the shaft a^{11}. The counter-shaft a^{20} may be connected in any desired way with the main driving-shaft. a^{26} presents the usual stripping-apron mounted and operated in the usual way. In order to keep the amount of stock presented to the action of the spike-apron constant, we provide the mechanism now to be described.

At some suitable point in the chamber a', and crosswise thereof, we arrange a shaft b, the ends whereof are mounted in suitable bearings in the framework. To this shaft is con-

nected one edge of a table b', the width of the table being such that the free edge b^2 thereof will clear the apron a^7 as the table is moved or rotated by means hereinafter described.

The stock represented in Fig. 1 by the symbol b^3 normally rests upon the table, and if present in sufficient quantities will force the free edge b^2 of the table against the framework, as shown in Figs. 1, 2, 4, and 5.

b^4 represents an arm fast upon the shaft b, provided with a weight b^5 of sufficient heaviness to overbalance the weight of the table b^4, so that when the weight of the stock upon the table b' falls below a certain predetermined figure, said table will be moved from the position shown to a substantially horizontal position. The amount of movement of the table is unimportant, the essential thing being that when the amount of stock in the chamber a' falls below a certain predetermined weight, that motion shall be communicated or transmitted to the shaft b, the construction and arrangement of the parts being such that when the weight of the stock b^3 is sufficient to depress the table b^2, the feeding of the stock into the chamber a' is stopped. When, however, the table b' rises, the resulting motion of the shaft b starts certain mechanism, whereby additional stock is fed into the chamber, until the table is depressed in the position shown in the drawings. It will thus be seen that the supply of stock in the chamber that is presented to the action of the spike or lifting apron is kept practically constant, the table b' and shaft turning to operate the mechanism hereinafter described, when the supply of stock falls below a predetermined amount.

c represents a chute connecting, preferably, with a room, or compartment, or hopper (not shown) above that in which the feeder is located, and containing stock. In this chute are two delivery-wheels $c'c^2$, the former located above the latter, and the two being arranged in a staggered manner. The wheel c' is provided with a blade c^3 for pulling down the stock b^3. As the latter falls it strikes upon the wheel c^2, whose arms c^4 throw and deliver the stock into the chamber a', and upon the table b'. These wheels c' c^2 serve not only to deliver or feed the stock to the table, but also to disintegrate the stock, and break up the same where it has become bunched, and may therefore be termed "disintegrating members."

The wheel c' is mounted upon a countershaft c^5, suitably journaled in the walls of the chute. This shaft is driven by a belt c^6, arranged upon a pulley (not shown) fast upon the shaft a^9 of the spike-apron, and upon a pulley (not shown) loose upon the shaft c^5. A belt c^6 is mounted upon a pulley c^7, fast upon the shaft c^5, and upon a pulley c^8, fast upon the shaft c^9, upon which the wheel c^2 is mounted. The pulley upon the shaft c^5, upon which the belt c^6 is mounted, forms a part of a clutch c^{10}, fast upon said shaft, and which may be of any desired construction. c^{11} is a rod connected at one end to an arm c^{12}, fast upon the shaft b, and at its other end to a trip-latch c^{13}, the free end of which is designed to engage some suitable member upon the clutch c^{10}, arranged to clutch the loose pulley driven by the belt c^6, in order to drive the shaft and its wheel whenever the table b' is raised, thereby raising the arm c^{12} and depressing the free end of the trip-latch c^{13}, removing the latter from engagement with the clutch.

From the foregoing it will be seen that the stock will not be fed from the chute into the chamber a' except when the wheels c' c^2 are operated, and that this operation of the said wheels will only occur when the amount of stock b^3 present in the chamber and upon the table has fallen below a predetermined weight, thereby enabling the weight b^5 to raise the table, and thereby releasing the clutch c^{10} from the action of the trip-latch, and permitting the shaft c^5 to be operated, when the wheels c' c^2 will feed the stock into the chamber a'.

Instead of the means above described (shown in Figs. 1 and 2) for presenting a uniform supply of stock to the action of the spike-apron, we may employ the means shown in Figs. 4 and 5. In the latter construction we dispense with the chute, the stock being thrown into the feeder or breaker by hand, or in any desired way, and thence presented to the action of the spike-apron and maintained there in a predetermined quantity by a supplemental spike-apron f. This supplemental spike-apron f is mounted upon shafts $f'f^2$, suitably journaled in the lower and upper part of the framework, the supplemental spike-apron f being arranged within the chamber a' and between the apron a^7 and the receiving-opening r of the feeder. The belt f^3 may be used to connect a pulley f^4, fast on the shaft a^9, to a pulley f^5, loose on the shaft f^2, and forming a part of a clutch f^6, fast on said shaft f^2. This clutch may be of any desired construction. The vibrating comb a^{10} is arranged to operate in connection with the apron a^7, while the vibrating comb a^{15} is arranged to operate with the supplemental spike-apron f, these two combs being connected and operated by means of the pitman a^{13}, as hereinbefore described.

f^7 represents a clearing-wheel mounted in the top part of the chamber a', and in such position in relation to the supplemental spike-apron f as to clear the stock from the spikes of the said apron in the usual and well-known way. As the stock is cleared from the supplemental spike-apron f, by the wheel f^7, it falls upon the table b', connected, by means of the shaft b, arm c^{12}, rod c^{11}, trip-latch c^{13}, with the clutch f^6 in the same manner as with the clutch c^{10}, (shown in Figs. 1 and 2,) the table b' and its associated parts being the same in both cases. A shield f^9 may be provided to guide the stock upon the table and to keep it

from falling between the apron and the shaft b or edge of the table.

The construction and arrangement of parts are such that when the table b' is in the position shown the trip-latch will be maintained in engagement with the clutch f^6, and the shaft f^2 will remain stationary. When, however, the stock upon the table b' falls below a predetermined amount, the table will be raised by means of the weight f^5, the shaft b will be rocked, and the trip-latch removed from engagement with the clutch, permitting the pulley f^5; in connection with the clutch f^6, to turn the shaft f^2, and thereby operating the supplemental spike-apron f, feeding stock from the receiving part r' of the chamber a' onto the table b' until the amount of stock is sufficient to depress the table, thereby throwing the end of the trip-latch into engagement with the clutch, and releasing the latter and the shaft from the driving action of the pulley f^5.

It sometimes happens that the parts of the clutch operated through the medium of the stock do not operate from a slight movement of the table; and it might happen that the parts of the clutch would stick, so that the weight b^5 would not be sufficient to operate the same. To obviate this difficulty, and to provide means for operating this clutch each time that the scale-pan is emptied, we rigidly secure upon the shaft b an arm a^{22}, carrying a roller a^{21}, arranged to engage the top of an arm a^{20}, that forms a part of the lever a^6, or weighing-arm. From this construction it follows that as often as the scale-pan is dumped this arm a^{20} is raised, thereby rocking the shaft b, operating the rod c^{11}, and releasing the pawl or dog c^{13} from the teeth of the clutch. It is obvious that if the pawl has already been released by means of the table, at this time, the upward movement of the arm a^{20} will not produce any additional result; but if the clutch is uncoupled when the scale-pan is dumped, the upward movement of the arm a^{20} will permit the clutch to couple itself and permit more stock to be fed to the action of the spike-apron, the amount so fed in at each dumping of the scale-pan being a little less than the minimum required, thereby obviating the difficulty of the chamber in which the spike-apron is located ever becoming emptied, the supply of the said chamber being kept uniform both by the operation of the table and by the operation of the weighing-arm.

From the foregoing it will be seen that as the stock that is presented to the action of the supplemental spike-apron is used up additional stock will be delivered upon the table b', by means of the supplemental spike-apron f, as in the case of the chute and mechanism shown in Figs. 1 and 2. In both cases the amount of stock presented to the action of the spike-apron is automatically regulated and controlled, and kept constant. The spike-apron a^7, having presented to its action a uniform amount of stock, will be enabled to deliver a uniform amount of stock, and hence the scales a^2, if desired, may be dispensed with.

Having thus explained the nature of our invention and described a way of constructing and using the same, though without attempting to set forth all of the forms in which it may be made, or all of the modes of its use, what we claim, and desire to secure by Letters Patent, is—

1. In a first breaker, or feeder, in combination, a spike-apron, and means for driving the same, a chamber in which said spike-apron is located, a controlling-table mounted in said chamber, means for delivering stock to said chamber, and against said table, said means comprising two disintegrating members adapted to rotate in different directions, and connections between said table and said stock-delivering means whereby said stock-delivering means may be automatically controlled by said table, and the supply of stock presented to the action of said spike-apron may be automatically controlled, as set forth.

2. In a first breaker, or feeder, in combination, a spike-apron, and means for operating the same, a weighing device to which said spike-apron delivers, a chamber in which said apron is located, a regulating-table arranged in said chamber, means for feeding stock to said table, a clutch for controlling said means, connections between said table and said clutch, and connections between said weighing device and said clutch, substantially as and for the purpose set forth.

3. In a first breaker, or feeder, in combination, a spike-apron, and means for operating the same, a weighing device to which said spike-apron delivers, and means for feeding stock to said spike-apron, a clutch for controlling said means, and connections between said clutch and said weighing device for operating said clutch through the medium of said weighing device, substantially as and for the purpose set forth.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, this 2d day of July, A. D. 1895.

PHINEAS FEATHER.
MICHAEL J. CLARK.

Witnesses:
JAMES T. JOSLIN,
RALPH E. JOSLIN.