

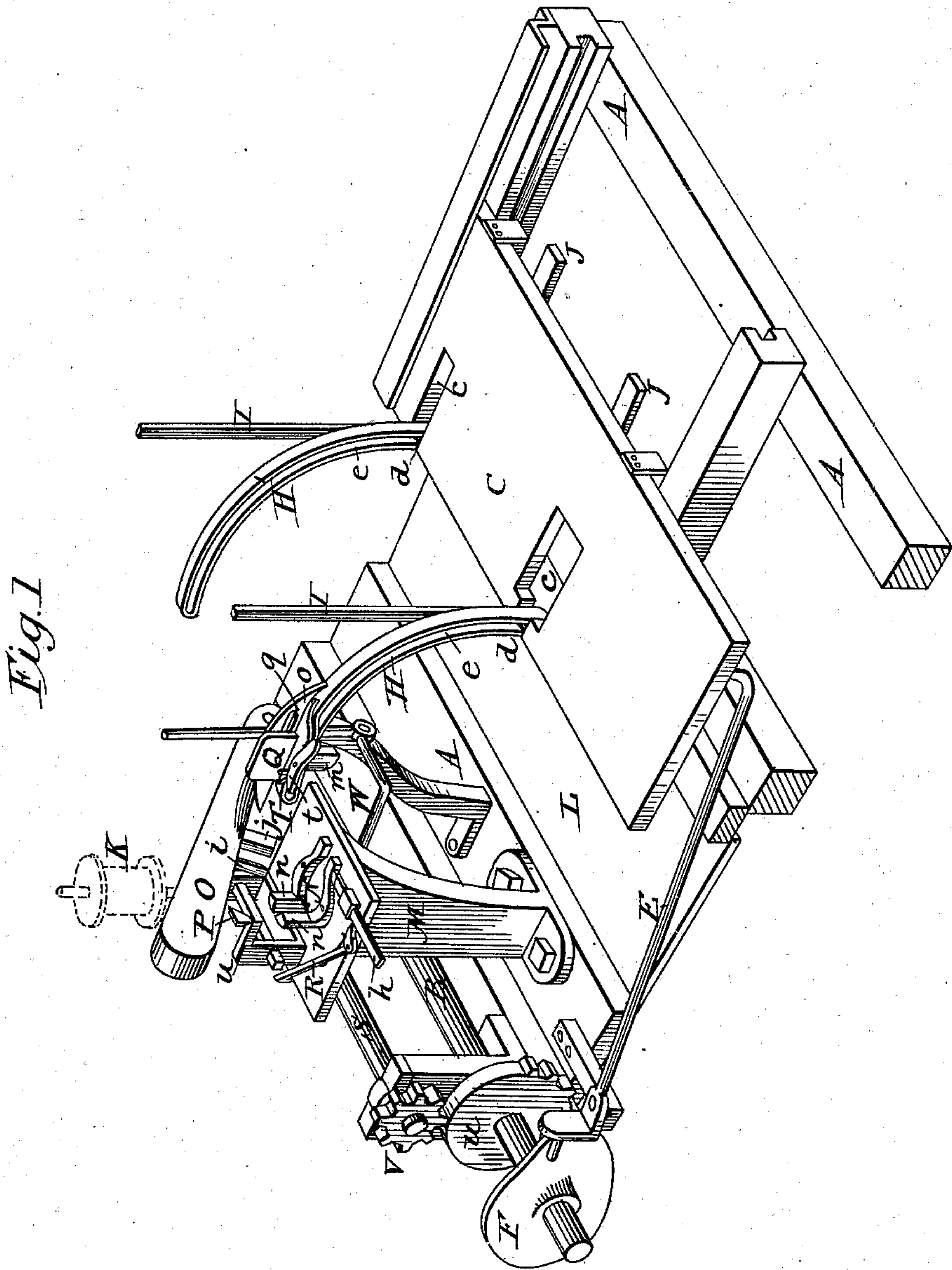
(Model.)

2 Sheets—Sheet 1.

J. R. PRESCOTT.  
GRAIN BINDING MACHINE.

No. 258,204.

Patented May 16, 1882.



*Attest.*  
*S. P. Hollingsworth*  
*Walter S. Dodge.*

*Inventor.*  
*Joseph R. Prescott,*  
*by Dodge Son,*  
*Attys.*

(Model.)

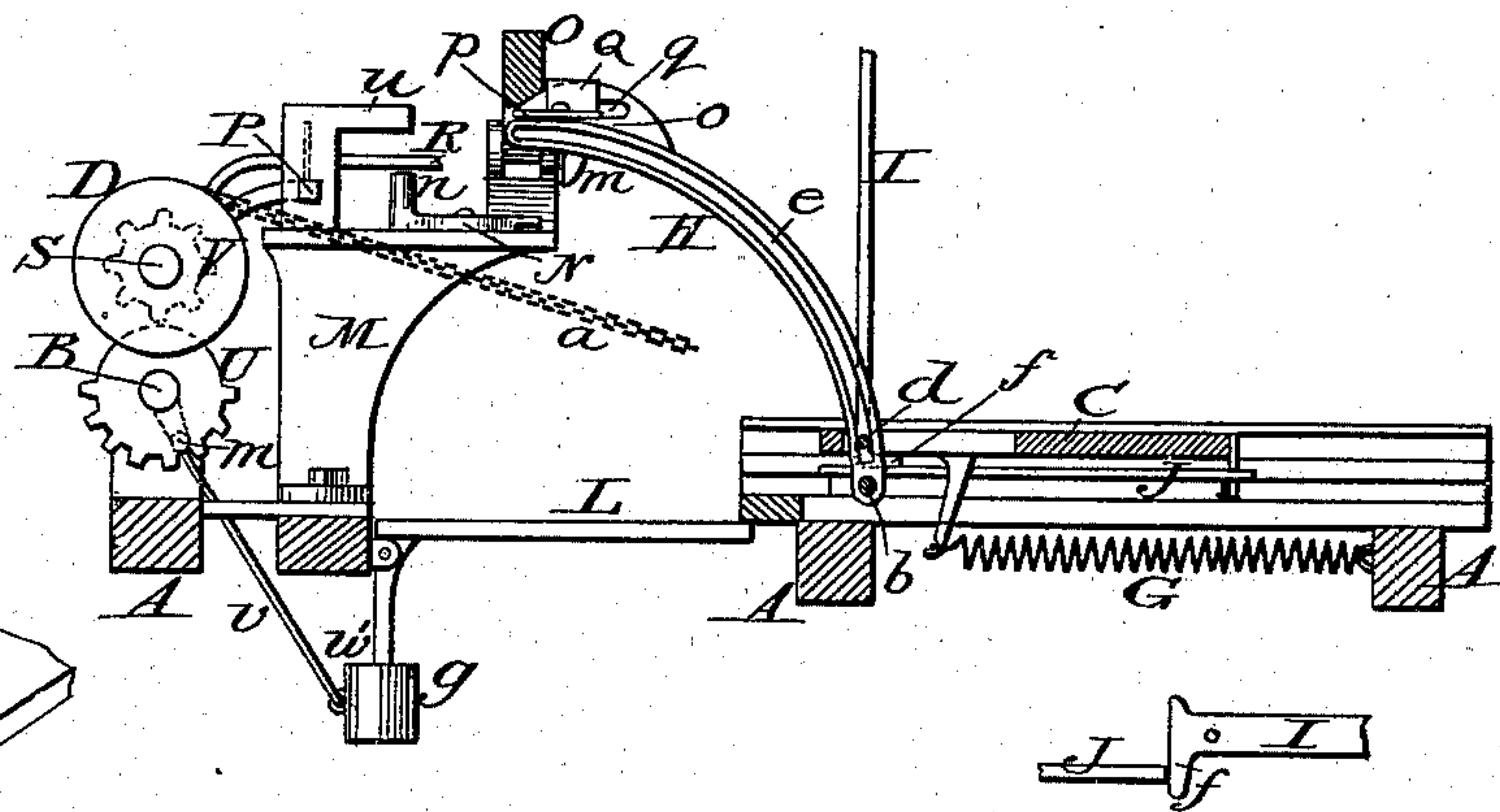
2 Sheets—Sheet 2.

J. R. PRESCOTT.  
GRAIN BINDING MACHINE.

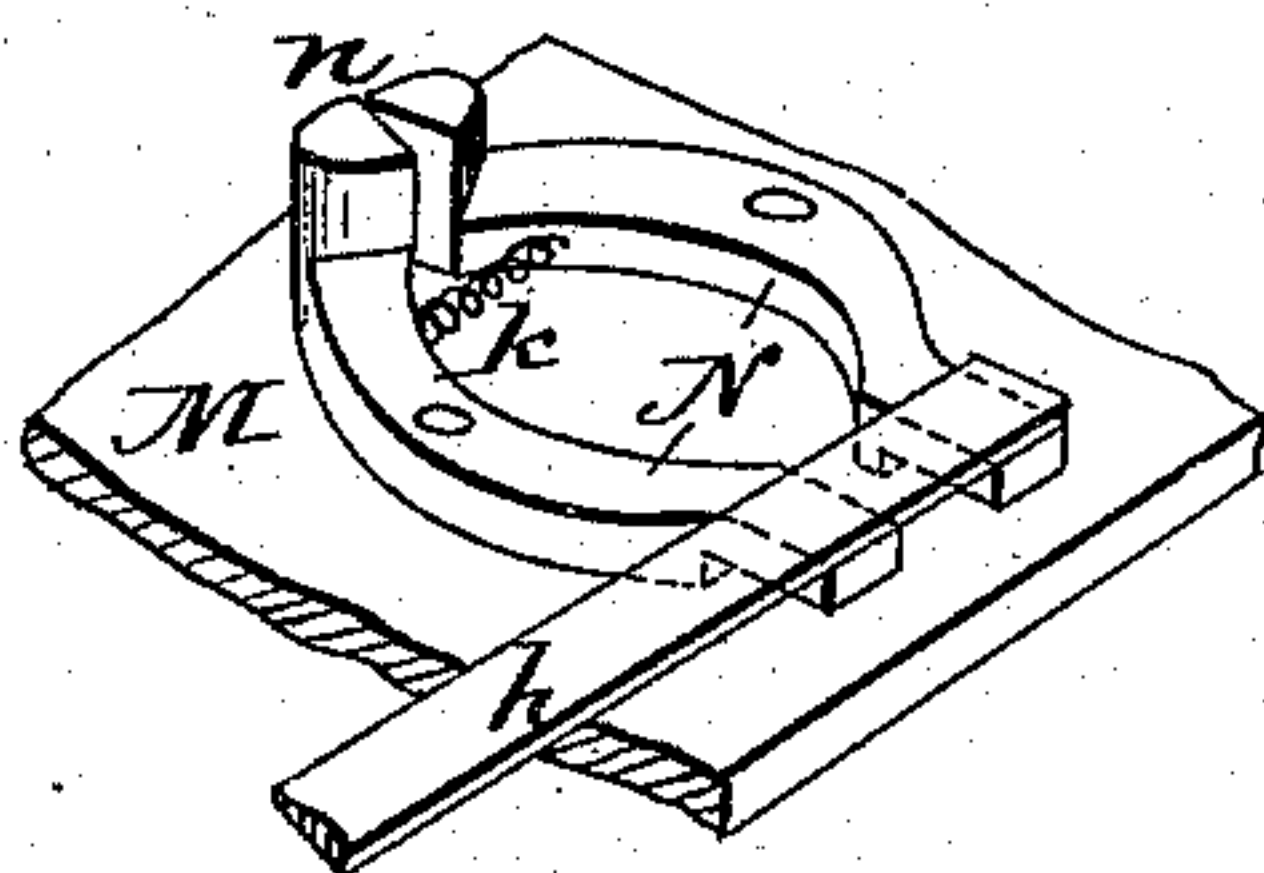
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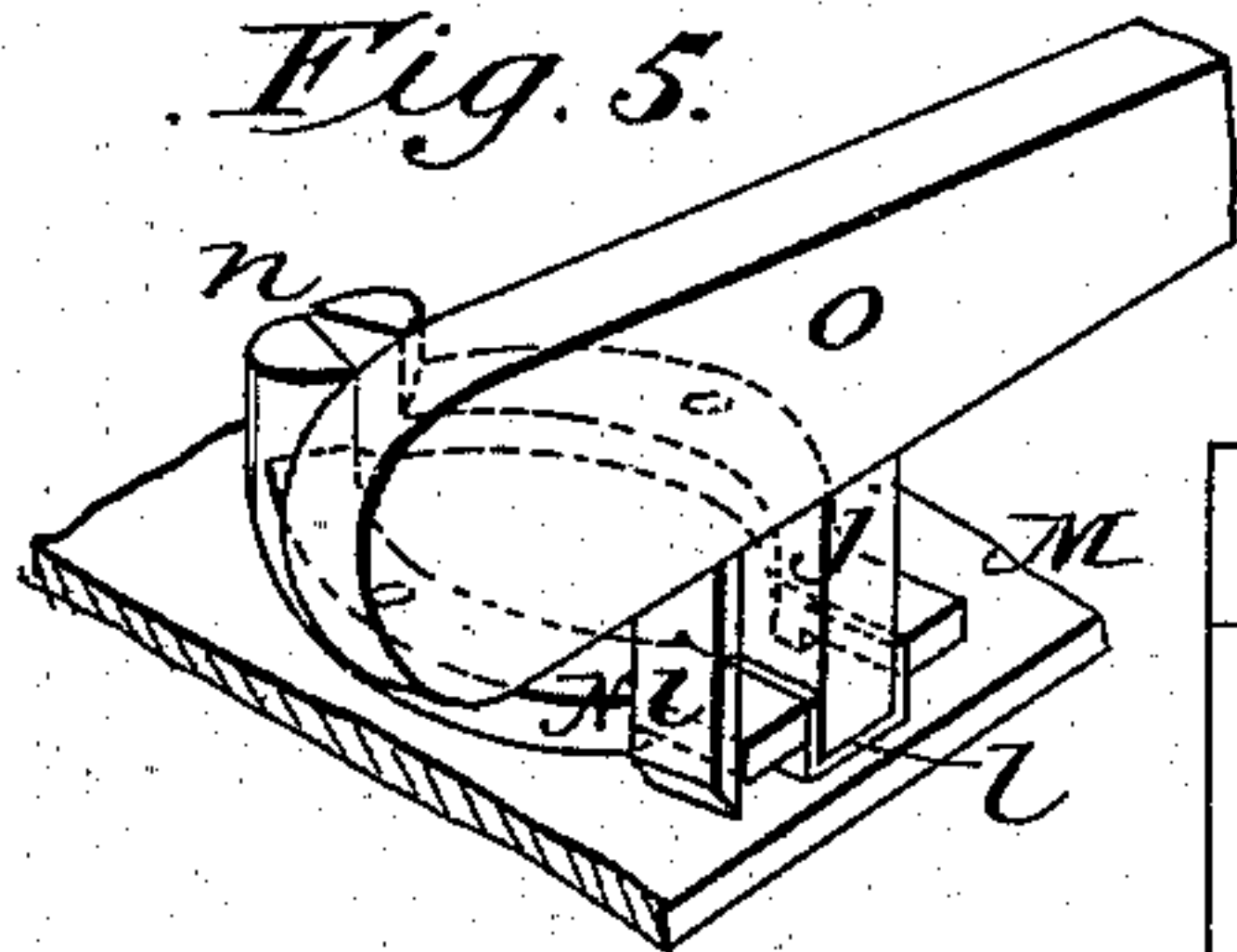
*Fig. 2.*



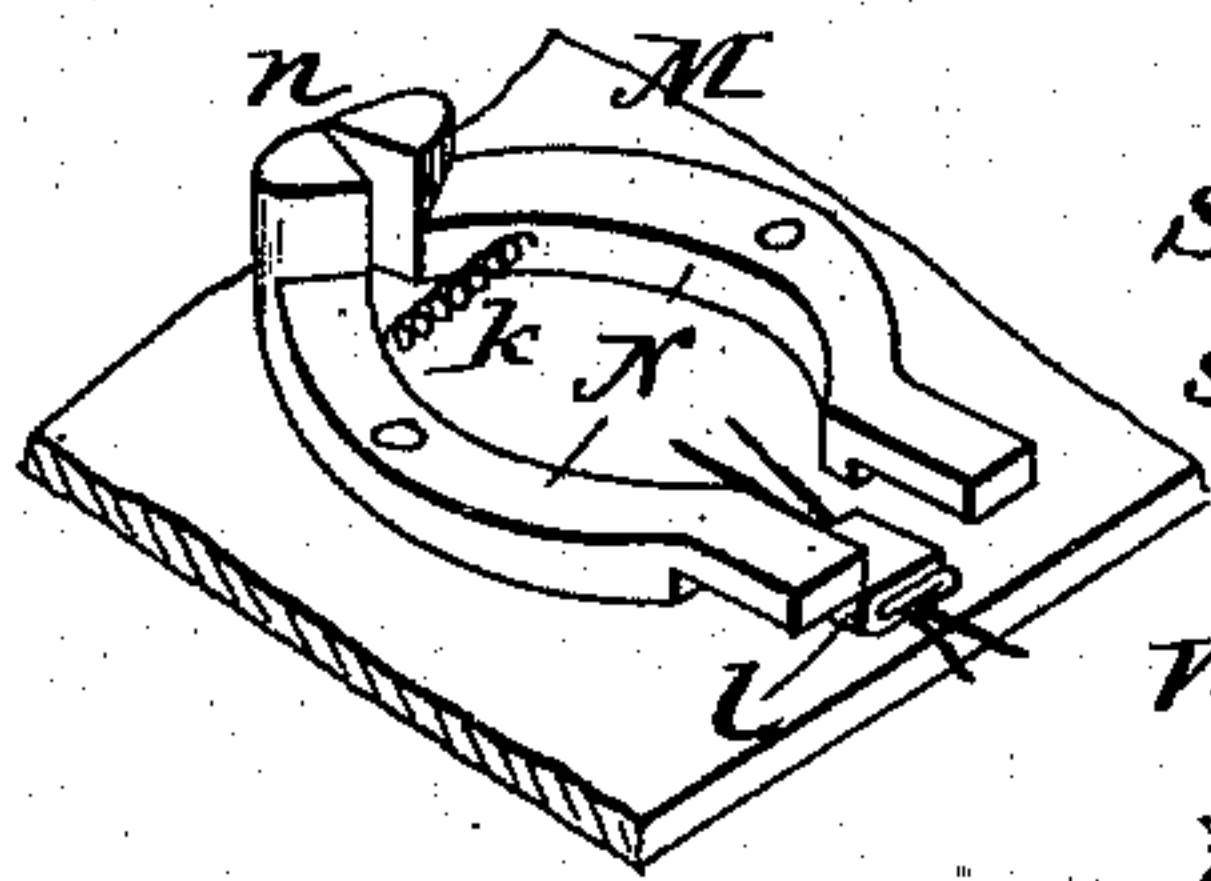
*Fig. 4.*



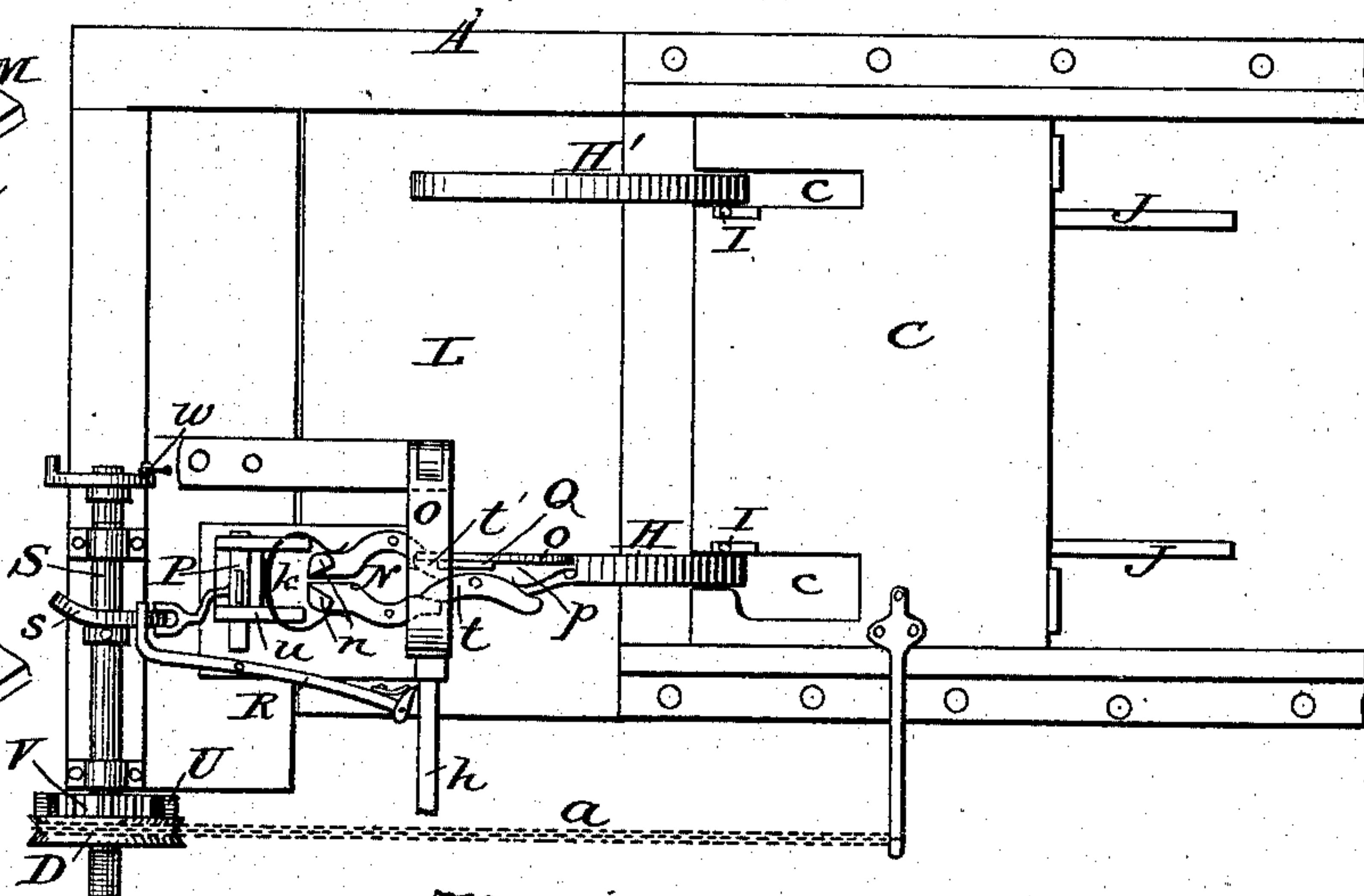
*Fig. 5.*



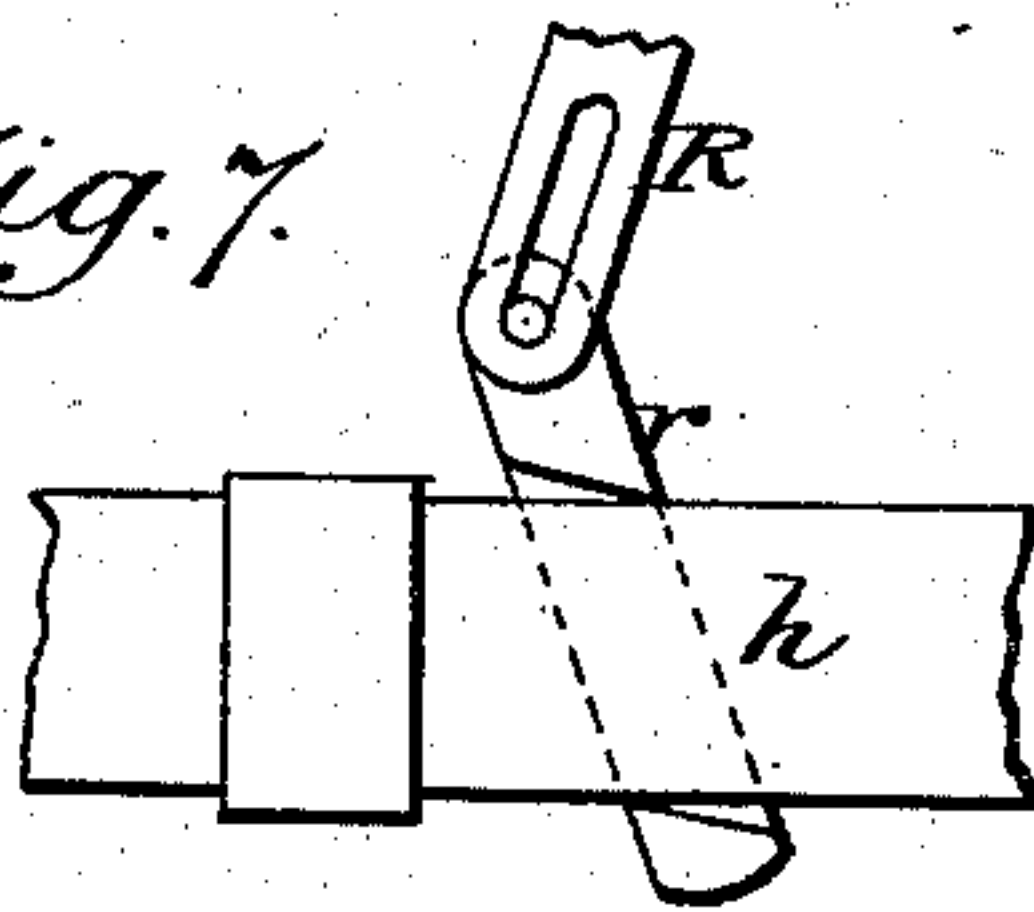
*Fig. 6*



*Fig. 3.*



*Fig. 7.*



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# UNITED STATES PATENT OFFICE.

JOSEPH R. PRESCOTT, OF BEAVER DAM, WISCONSIN, ASSIGNOR OF ONE-FOURTH TO RICHARD J. ANDREWS, OF SAME PLACE.

## GRAIN-BINDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 258,204, dated May 16, 1882.

Application filed January 17, 1882. (Model.)

*To all whom it may concern:*

Be it known that I, JOSEPH R. PRESCOTT, of Beaver Dam, in the county of Dodge and State of Wisconsin, have invented certain Improvements in Grain-Binding Machines, of which the following is a specification.

My invention relates to a grain-binding attachment more especially intended for use in connection with reaping-machines, but which may also be applied to harvesters.

The improvements consist in pivoted arms arranged to lie down close to the grain-receiving table while the grain is being received, and to rise and to throw the grain forward when the gavel is to be formed; in a cord-carrying and gaveling arm, provided with a cord-holder and arranged to fall and to remain normally beneath the grain-table, but to rise and advance with the grain delivered by the pivoted arms as the binding operation commences; in a cutting device and a former, both operated by the nose or forward end of the cord-carrying arm, and adapted to cut from a continuous strip of sheet metal a piece sufficient for a clip or fastener, and to bend the same into shape to receive the ends or strands of the applied band; in a hammer which rises and falls with the cutter, assists in forming the clip, and afterward serves to close the same; in a cord-cutter arranged to sever the applied band from the main supply of band material; in a bundle-dropper, and in various other features and details, hereinafter set forth and explained.

In the accompanying drawings, Figure 1 represents a perspective view of the binding mechanism or attachment; Fig. 2, a face elevation, partly in section; Fig. 3, a plan view; Figs. 4, 5, and 6, enlarged views, showing the manner of forming and applying the clip or fastening to the applied band; and Fig. 7 an enlarged view of the clip-band feeder.

The object of my invention is to produce a simple and cheap binding attachment, adapted for use in connection with the ordinary reaping-machine, thus avoiding the expense and the excessive weight of a harvester; and with this object in view I construct my machine in the manner shown in the drawings, in which—

A represents a strong frame-work, which may be attached and secured in any conven-

ient manner to the reaper, and is furnished with a main drive-shaft, B, which in practice is connected with and driven by the drive-wheel of the reaper, and serves to give motion to the various parts of the binding mechanism, as hereinafter explained.

Within the frame A, I arrange a sliding grain-table, C, which is caused to move toward the shaft B at suitable intervals, either by an arm or lever, E, connected with the lower side of the table and operated by a cam, F, as shown in Fig. 1, or by a chain, a, winding upon a drum, D, as in Fig. 2, a spring, G, or a cord and weight being provided to retract the table C at the proper time.

H represents the cord-carrying arm, which, with a similar arm, H', is carried by a horizontal shaft, b, the ends of which slide in grooves beneath the grain-table C, said arms being curved, slotted, and arranged to pass upward through openings c in the grain-table, being raised and lowered, as the table moves back and forth, by transverse pins or bolts d, extending through the slots c and made fast to the sliding table, as shown in Figs. 1 and 2.

I I represent two arms, which are pivoted to the sliding table C, and provided each with a foot, f, which, coming in contact with the end of a track or rail, J, as the table starts forward, causes the arm to rise from its normal position and to stand upright, as in Fig. 1, the feet traveling upon the tracks and preventing the arms from falling backward or forward. The arms I I, as above stated, lie down upon the table C when the latter is in position to receive grain from the raking or delivering mechanism, and the grain therefore falls upon them, and is thrown forward by the arms as they rise to a point in advance of the arms H H', which then rise, as before mentioned, and gather the grain into a gavel, while at the same time the arm H carries the band about the grain.

The binding material, which will be preferably twine, is carried by a spool, K, any common form of tension device being applied, either to the spool or to the band passing therefrom, to regulate the paying out of the same, and a yielding take-up arm, such as is commonly used in machines of this class, being



employed to take up any slack that is occasioned by the operation of the machine, if found necessary.

L represents the binding-table proper, hinged at one side, as shown in Fig. 2, and furnished with a counter-weight, *g*, a spring or equivalent device, which holds it normally in a horizontal position to sustain the bundle while being bound, the grain being delivered thereto by the arms H H' as they rise above the grain-table C and advance toward the binding-table.

The binding-platform is connected with the grain-table, as hereinafter explained, so that as the latter recedes to receive a fresh supply of grain the binding-platform is tipped and caused to drop the bundle previously bound.

At the rear side of the binding-platform is a bracket or standard, M, upon which is mounted the mechanism by which the ends of the applied bands are secured, said mechanism being operated principally by the cord-carrying arm H, the point or nose of which is suitably fashioned for this purpose.

The band-fastening mechanism consists of a reel or box containing a long strip or ribbon, *h*, of sheet metal, a feeding device for advancing the same across a pair of formers, N, pivoted to swing horizontally upon the upper face of the standard, a gravitating arm, O, carrying a blade or cutter, *i*, and a die, *j*, which serves first to bend the strip cut off by the blade *i* between the formers N into the form of the letter U, and subsequently to flatten down the upright sides of the clip or fastener upon the strands of cord carried between them by the cord-carrying arm H, which latter continues on with the ends, carrying them past a cord-cutter, P, which severs the applied band from the stock from which it is drawn.

Referring now to Fig. 1, the formers N will be seen to consist of two arms, bowed out and pivoted about midway between their ends to the upper face of the standard or bracket M, their forward ends being slightly cut away on the under side, and their rear ends being provided with beveled lugs *n* and held normally together by a spring, *k*, thus separating their forward ends, as shown in Fig. 4, in which position they stand when the strip *h* is fed forward to permit the necessary material for a clip to be cut from it. The strip being fed forward across the top face of the formers, the arm O descends, the blade or cutter *i* severing the clip *l* therefrom and the die *j* bending it into the form shown in Fig. 5 at the same descent. It will be seen that one of the formers serves as an anvil to support the strip while being cut, and that its outer edge and the falling blade act in the same manner essentially as the blades of a pair of shears. The rise and fall of the arm O are effected and controlled by the cord-carrying arm H, as presently described.

The operation of cutting off the clip and bending it into U form is effected as the cord-carrying arm recedes from the clip-applying

mechanism. Hence, when the cord-carrying arm comes forward, bringing the two strands of the applied band with it, the open clip is in position between the formers N, and, being directly in the path of said strands, the latter are laid directly across and into the clip. A beveled lug or projection, *m*, on the cord-carrying arm H then enters between the beveled lugs or projections *n* of the formers N, throwing their forward ends together and folding down the upright sides of the clip, as in Fig. 6, the projection *m* passing from between the lugs *n* and permitting their forward ends to separate, at which moment the die or hammer *j* again descends and flattens the clip upon the strands. The movement of the cord-carrying arm continuing, the strands are carried across the path of reciprocating blade or cutter P and severed, as above mentioned.

By again referring to Figs. 1 and 2 the construction of the cord-carrying arm and the manner in which it controls the fastening devices will be explained, it being first stated, however, that the arm O is pivoted to lugs on the bracket-top and extends directly across the path of the cord-carrying arm, which passes under it in advancing and receding. As clearly shown in said figures, the arm is formed with a pointed end and furnished on its upper side with a vertical rib, *o*, curved or inclined downward at both ends, said rib being slotted horizontally to receive a rib or guide-pins of a sliding plate or block, Q, which stands by the side of and rises slightly above the rib *o*, as shown. The lower edge or face of the plate or block rests and slides upon a lateral extension, *p*, of the cord-carrying arm, and its upper corners are slightly beveled or rounded, as shown. The plate or block is free to slide back and forth within the limits of the slot *q*.

From the foregoing it will be seen that as the cord-carrying arm advances, its pointed nose passing just beneath the arm O, the arm will be raised by the inclined face of the rib *o*, and, coming into contact with the plate Q, will move the latter to the limit allowed by the slot *q*, and then, raised by the beveled corner of said plate, the arm O will permit the latter to ride under it to its end, when the arm will suddenly fall and flatten the strip through which the strands have been previously laid and which has been folded, as above explained. The cord-carrying arm continues its motion until, reaching its limit and having performed its functions in that direction, it starts back. In thus moving back the inclined rib *o* again raises the arm O, the plate Q being, as before, moved to the end of its slot, but in the reverse direction, and the arm O again falls, cutting off and bending the clip *l*, the strip *h* being fed forward, as the arm is raised, by the receding cord-carrying arm.

The feeding device by which the strip *h* is fed forward may be a vibrating lever, R, slotted at one end and carrying a block, *r*, through which the strip passes, the block being caused



to turn or swing about its connection with the lever R, and to cramp or lock upon the band *h* in going forward, but to move freely back upon the same when the motion of the lever is reversed.

The lever R may be operated by a cam, *s*, on a rock-shaft, S, or in any other convenient manner, as may also the cutter P.

The cord or band for each bundle is drawn from the reel by the cord-carrying arm H, which, for the purpose of holding the end of the new band, is furnished with a cord-holder, T, consisting of a spring-pressed pivoted jaw, *t*, and a stationary jaw, *t'*, the forward ends of both being beveled or rounded to cause the cord to be readily caught by them.

In starting the machine the jaws *t t'* are separated and the end of the cord is placed between them. The cord-carrying arm, receding, draws off the required amount for the band, and after the grain has been delivered in advance of said arm and across the band the arm, rising and advancing, carries the band over the top of the grain, and, still advancing, comes in contact with the other strand or end of the applied band coming from the reel, carrying said latter end before it across the U-shaped clip, laying both strands across and into the clip, whereupon the arm O descends, and the fastening of the clip is completed, as before explained. At this moment the outwardly-projecting rear end of the pivoted jaw *t*, coming in contact with a fixed arm, *u*, is pressed inward, causing the jaws to open and permitting the strand from the reel to enter, the advance of the arm causing said strand or end to be forced or wedged between the jaws sufficiently to insure its retention while the pivoted jaw rides off the stationary arm *u*, the fact that the cord hangs from a point in rear of the cord-holder tending also to insure such retention. Just after the second strand is thus seized the knife P is operated and the applied band severed below the cord-holder, thus leaving the portion passing from the reel to the cord-holder intact and the new end in the cord-holder. The bundle is thus completely bound and its band severed from the stock on the reel. As the grain-table and cord-carrying arm recede, the latter being thrown down beneath the table, as explained, the binding-platform L is tipped or thrown down by means of a chain or band, *v*, connected at one end to a crank, *w*, on the rock-shaft S, and at the other end to an arm, *w'*, depending from the under side of said platform, the tipping of the platform serving to discharge the bound bundle. As the grain-table again starts forward the tension of the cord or band *v* being removed, the counter-weight *g* restores the binding-table to its horizontal position.

The movements of the grain-table C, and consequently the movements of the cord-carrying arm H and its companion H', as also of the arms I, are controlled by the gearing U V, Figs. 1 and 2. The wheel U, which is keyed

or secured upon the main drive-shaft B, is provided with teeth or cogs on one-half its circumference only, the intervening portion being cut away, while the wheel or pinion V is furnished with teeth upon its entire periphery. It will thus be seen that as the shaft B rotates continuously in one direction the teeth of wheel U, engaging with those of the wheel or pinion V, will cause the latter to turn until the cut-away portion or delay surface of wheel U comes opposite the teeth of wheel V, when all effect of one upon the other will cease, and each will become free to move independently of the other. When the wheel or pinion V is thus released the grain-table is withdrawn by a strong spring, G, or by a cord and weight or equivalent means, causing the chain or band *a* to unwind from the reel D, thus turning the shaft S backward and lowering the crank *w*, and permitting the binding-table to resume its horizontal position.

An arm, W, operated by a cam on one of the shafts B S, bears upon the cord coming from the reel, and serves to draw it down to or toward the binding-table.

The arm H', acting in conjunction with the arm H, insures the proper advance of the grain, and prevents its disarrangement.

The arm O may be provided with a stop to limit its upward movement, and may also be furnished with a spring to assist in cutting the metal strip and bending and flattening the same, if required.

It will also be understood that without departing from the spirit of my invention the arrangement of the driving-gear may be modified to adapt it to reapers of different make or construction.

The grooves in which the ends of the shaft *b* move permit the cord-carrying arm H to have the required sliding movement for operating the arm O.

I am aware that raking-fingers have been arranged to rise in a manner similar to the arms I I, and to move forward through openings in the grain-platform; but I am not aware that such arms have ever before been applied to a sliding platform. By my arrangement the movement of the grain over an extended surface, and the consequent thrashing out of the heads, is avoided.

I am also aware that a pivoted binding table or platform has been arranged to tip and automatically discharge the bound bundle, and this I do not broadly claim.

Having thus described my invention, what I claim is—

1. In a grain-binding machine, the combination of a sliding grain-table and one or more pivoted arms adapted and arranged to lie down close to the table while receiving grain, but to rise and throw the grain forward as the table advances, substantially as explained.

2. In combination with the sliding grain-table C, one or more pivoted arms, I, each provided with a foot, *f*, and a track or rail, J, lo-



cated beneath said foot or feet, substantially as shown and described.

3. In combination with a sliding grain-table, a cord-carrying arm pivoted beneath the table and arranged to rise through an opening therein as the table advances.

4. In combination with the sliding grain-table and the cord-carrying arm H, arranged to rise and move forward with the table, the arm H', arranged to operate as and for the purpose explained.

5. In combination with a sliding grain-table, a cord-carrying arm mounted upon a shaft the ends of which are seated and arranged to slide in grooves, substantially as shown and described.

6. In a grain-binder, a cord-carrying arm pivoted beneath the grain-table and arranged to rise through an opening in the same and to move forward, substantially as explained.

7. In combination with the sliding grain-table C, the cord-carrying arm H, pivoted beneath the same and adapted and arranged to rise gradually as the table moves forward, and the arms I, arranged to rise at the commencement of said forward movement and to throw the grain in advance of the cord-carrying arm.

8. In combination with the sliding grain-table C, a pivoted binding-platform, L, and intermediate connections, substantially as shown and described, whereby the binding-table is caused to fall as the grain-table moves back to its receiving position and to rise as the grain-table advances with a fresh supply of grain.

9. In combination with the rock-shaft S, provided with crank *w* and drum D, the pivoted binding-platform L, and sliding grain-table C, connected respectively with the crank and drum, substantially as and for the purpose explained.

10. In combination with the pivoted binding-platform L and means, substantially such as shown, for positively tipping the same, a counter-weight, *g*, or its equivalent, connected with the binding-table and adapted to return the same to its normal position when tipped or thrown down.

11. In a grain-binding machine, the combination of a gravitating arm carrying a cutter, and a reciprocating arm arranged, substantially as described, to raise and release the gravitating arm, whereby it is adapted to cut blanks from a strip for the formation of clips, substantially as explained.

12. In a grain-binding mechanism, the combination of a pivoted arm carrying a die, and a reciprocating arm adapted and arranged to elevate and release the die, substantially as described, whereby said die is caused to act upon the clip-blank, as explained.

13. In combination with the pivoted arm O, the reciprocating arm H, provided with the inclined rib *o*, and the sliding plate Q, whereby the arm O is raised gradually and permitted to fall suddenly.

14. In a clip forming and applying mechanism, the combination of the formers N, arranged to separate from each other and sustain the ends of the blank, and subsequently to fold the same, and a die or hammer adapted and arranged to act upon the blank before and after the folding operation, first to bend it into U form and afterward to flatten down the ends, substantially as set forth.

15. In combination with the pivoted folding arms or formers N, having beveled lugs at their rear ends, the arm H, provided with a beveled projection to enter between said lugs and throw the forward ends together.

16. In a grain-binder, the combination of grain-table C, arms I, cord-carrying arm H, and clip-applying mechanism adapted and arranged to be actuated by the cord-carrying arm, substantially as shown and described.

17. The herein-described grain-binding attachment, consisting of table C, arms H and I, binding-table L, and their operating mechanism, arm O, provided with a cutter and a die or hammer, and the arms N, adapted and arranged to be actuated by the arms H.

JOSEPH R. PRESCOTT.

Witnesses:

RICHARD J. ANDREWS,  
J. E. HOSMER.